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REPORT OF THE INDIAN FAMINE COMMISSION.

APPENDIX.

VOL. III.—EVIDENCE IN REPLY TO INQUIRIES OF THE COMMISSION.

Chapter I.—Condition of the Country and People.

Presented to both Houses of Parliament by Command of Her Majesty.

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BOMBAY BRANCH
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Royal Asiatic Society.
CLASS

REPORT OF THE INDIAN FAMINE COMMISSION.

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CX-K-41a

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INQUIRIES ADDRESSED BY THE FAMINE COMMISSION TO THE VARIOUS LOCAL GOVERNMENTS AND ADMINISTRATIONS.

CHAPTER I.

CONDITION OF THE COUNTRY AND PEOPLE.

1. RAIN-FALL.

What is the normal system of rain-fall in your province? From what quarter does the rain come, and in what months does it fall? Give any returns you possess showing the average amount gauged in each month; and state whence they are obtained, and how the registers of rain-fall are kept. Within what limits can the rain-fall vary without doing serious injury? What is the amount of rain-fall for each month, and for the whole year, which, judging from past experience, you consider to be sufficient for agricultural necessities? What are the different agricultural operations depending on the due arrival of each of the expected monsoons or seasonal rains? What is the effect on the crops of the failure of any of these elements of rain-fall, and what is the combination of circumstances under which the worst results have been produced? So far as necessary differences in the several districts should be distinguished, and separate returns supplied for them page 1.

2. PAST FAMINES AND THEIR EFFECTS.

What part of the country is most subject to famine and freest from it, and why? What is known as to past famines, their causes, their dates, their extent locally, and their severity as tested by prices, mortality, loss of revenue, and expenditure on relief? Give, as far as possible, precise figures. Has the province suffered from any other destructive calamity, such as floods, frost, hail, locusts, blight, &c., to such an extent as to produce distress amounting to famine, or to create any general and widespread failure of the crop? To what extent do famines in any past period appear to have affected the general condition of the country, and how long has the effect lasted? Has the condition of the country improved in spite of such calamities? What is the normal increase in the population of the country, and how far has it been affected and kept down by famine? What are the facts on which your opinion on these last points is based?
vide separate volume, "Famine Histories."

3. AGRICULTURAL STATISTICS.

Give any statistics you possess as to the average area in each district under cultivation yearly, distinguishing food crops from others; the average amount of the chief food grains produced per acre; the total consumption in the district of such grains; the surplus that remains for export, or the deficiency that has to be supplied by import in ordinary years. How are these statistics collected, what amount of reliance may be placed on them, and what suggestions can you make for their improvement? If you have no statistics on these subjects, give any approximation or estimate you can - - - - - page 41.

4. PROTECTION FROM DROUGHT.

What area of your province and of its several districts is protected from drought in an average year by irrigation from wells, tanks or jhils, canals, or channels from rivers? To how much of this area is the protection complete and permanent, and how much is dependent on the local rain? How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area? What is the effect of irrigation of crops (other than food crops) in adding to the powers of the population to resist famine? Supposing canals, tanks, wells, and jhils to be utilized to the utmost extent and kept in the highest possible order, what extent of the country would be protected from drought in a year when there was a failure of the rain?
page 98.

5. STAPLE FOOD GRAINS.

What grains form the staple food of your people? When are they sown and harvested, and what are the critical times at which rain is essential to each of them, or at which a failure or an excessive fall of rain may be mischievous or ruinous? - - - - - - - - - page 149.

6. MANURE AND ROTATION OF CROPS.

What proportion of the cultivated land and what class of crops is manured yearly, and what is the average weight of manure given to the acre (1) *in land constantly manured;* (2) *in land occasionally manured? If there is any customary rotation of crops or fallows, state it* - - - page 158.

7. AGRICULTURAL IMPROVEMENT.

Have any attempts been made by the Government or private persons to improve agriculture in your province, either in the way of introducing new or improved implements, or new staples, or improved seed, or better methods of cultivation, or better breeds of cattle, and so forth? and with what result? Have you any suggestion to make for such improvement? Is there any Government model farm in your province? Or have any estates under the management of Government or of the Court of Wards been used for the object of making experiments or setting examples of improved agriculture? If so, state the system of management, whom they were placed under, and what the results, financial and agricultural, have been. Have any improvements been made in the breed of cattle, in the forms of ploughs, carts, sugar mills, or any other agricultural instruments, or in the mode of drawing water from wells? Have any agricultural exhibitions been held in your province, and have you observed that any good result has been obtained from them? Was *anything exhibited the imitation or adoption of which would have been useful to, and practicable by, the ordinary cultivator? And, if so, was there any willingness to imitate or adopt such improvements? Have you observed that there has been any deterioration of the soil, or that crops are worse than they used to be within your own experience? Does any such question specially arise in case of irrigated land? State specifically on what facts you base your replies. Where there is any popular belief in such deterioration, state what facts are adduced in support of it* - - - - - - - - page 177.

8. PROPORTION OF POPULATION ENGAGED IN AGRICULTURE.

What proportion of your population is agricultural, that is, either directly engaged in the cultivation of the soil, solely or in combination with some other occupation, or deriving their chief income from the land? And of this class what proportion live entirely by the profits of the cultivation of their own land, and what proportion support themselves wholly or in part by field labour for others? - - - page 227.

9. DAILY LIFE AND CIRCUMSTANCES OF CULTIVATORS.

What is the ordinary economic condition of the portion of the agricultural population directly engaged in the cultivation of the land and possessing any proprietary or occupancy interest in land? Illustrate your reply by giving the actual facts as to a few typical instances of such persons taken from four or five different villages in several districts of your province. State, with regard to each, what area of land he holds for tillage or grazing, what his family consists of, what amount of food grain and what value of other produce he raises on an average off his land in a year, what rent or revenue or cesses he pays for his land, what expenses he incurs in hired labour (other than his own labour and that of his family), what amount he spends in a year in purchases of necessaries which he cannot produce on his land, what kind of house he lives in, how many rooms it possesses and how many out-houses, what quantity of cattle or other live stock he possesses, what other property, and what stock of grain. How does he dispose of any surplus income, whether by hoarding or lending his money, or investing it in ornaments, or spending it on marriage ceremonies, or otherwise? What are his debts, and to what are they commonly due? State what proportion of the agriculturists of your district you believe to be in debt, and what proportion their average indebtedness bears to their average yearly income. Endeavour to obtain the opinions on these points of well-informed and trustworthy Native residents of different districts, and in submitting such opinions explain the position of your informants, and the probable means at their command of forming correct conclusions - - page 237.

10. SYSTEMS OF LAND TENURE.

Describe the tenures of land (proprietary and occupancy) which are most common, and as nearly as you can the area of cultivated land held by each kind of tenure. How far does the character of the tenure appear to affect the economic condition of the person holding it? Are there any conditions of tenure (such, for instance, as unrestricted freedom of transfer) which might be changed with advantage to the holder and without injury to other parties? - - - - - - - - - - page 324.

11. IMPROVEMENTS BY LAND OWNERS.

Are the holders of the above tenures in the habit of carrying out material improvements, such as digging wells or channels necessary in order to use the water in a canal? Are their actions in this respect affected most by the security or insecurity of their tenure, or by their wealth or poverty? Or are there any other reasons which hinder such investments of their labour and capital? What have been the effects of recent Land Improvement Acts? Have they tended to enlarge or narrow the making of advances by Government? Does the condition of the country render it desirable that the operation of these Acts should be facilitated, or their scope enlarged, and are there any apparent difficulties in the way of doing this that could be removed? Is the demand for interest on Government advances obstructive or prohibitory? - page 349.

12. EFFECT OF THE LAW ON IMPROVEMENTS IN LAND.

How far is the landowner's or the cultivator's readiness to improve the land checked by any operation of the law? Is the digging of wells checked in any such way? How far does the expectation of having to pay increased revenue or rent in consequence of any improvement check the execution of improvements? page 362.

13. INCIDENCE OF LAND REVENUE.

What is the general incidence of land revenue on the cultivated area, both for the arable land as a whole and for the different classes of such land (irrigated, dry, &c.)? What proportion does such revenue bear to the value of the gross produce? Is the incidence on the various classes of land fairly distributed, or would you propose any re-adjustment of it? When was the assessment fixed? Has there been any practical difficulty in realising the land revenue as now assessed? At what dates are the instalments of revenue payable, and what relation do these bear to the ordinary periods of harvest or of realization of rents, as the case may be? Do the several instalments bear a fair proportion to the value of the several harvests from which the revenue or rent has to be made good? What rate of interest, if any, is charged on land revenue in arrear? - - - - - - - - - - - - page 364.

14. PRICE OF LAND AND ALIENATION OF ESTATES.

What is the average price of land per acre? What amount of land on an average is sold every year for arrears of revenue and for decrees of court? What quantity of land has been transferred in your district to non-agricultural and non-resident landlords? - - - - - page 400.

15. WAGES OF LABOUR.

What are the wages usually paid to hired field labourers? Are they paid in kind or money? Give the rates as far as you can for the chief kinds of labour in ordinary years. Is the hired labourer usually able to subsist with fair ease on the grain or other payments he receives at harvest and other periods during the intervals between such payments, or is he frequently forced to borrow and forestall future payments? page 418.

16. Price of Food Grains.

What is the normal rate of prices of each of the chief staples of food in certain typical districts? What is the usual variation between the prices at harvest time and other times of the year? What rise in price would indicate the approach of alarming scarcity? In past times of severe scarcity what effect has been produced on prices; has the rise been sudden or gradual, and has it affected one staple more than another? Or has the rise been of such a character as to tend to equalise the prices of all staples? - - page 431.

17. Trade and the Trading Classes.

What is the state of your province as to the activity of commerce? Has it an energetic and enterprising trading class? Do any of the districts subsist mainly on its own resources, and export or import little? Or is there an active and constant ebb and flow of trade? - - - - - - - page 446.

18. Roads.

What are the facts in your province as regards the means of communication? Do bridged and metalled roads connect all the important centres of trade that should be thus connected? Are the roads in good working order and sufficient for the traffic on them, or not? Are they open through the year, or closed for wheeled traffic in the rains? Is the ordinary means of conveyance by wheeled carriage, or by pack bullocks; and if by wheeled carriage, is there a sufficient number of carts in the district for all its wants? What is the ordinary cost per mile of conveying one ton of merchandise either by wheeled or by pack carriage? page 464.

19. Railways.

To what extent are railways developed in your province? What districts are not traversed by them, and what distances have to be gone to reach the railways from the districts furthest from them? Are any districts so much isolated as to make it desirable to extend railways to them to facilitate the introduction of food in time of famine? Has the effect of the existing railways been to equalise prices and stimulate trade to any important extent? Give any facts that support this view - - - - - page 475.

20. Water Communication.

If there is water communication in your district, give an account of it; what kinds of boats are used, what their number is, what the nature is of the traffic they convey; state whether the navigation is capable of any improvement, and whether it is conducted on natural channels, or by canals, and if by the latter, under what regulations. What is the ordinary cost per mile of boat carriage for one ton? - - page 486.

21. Need of Additional Communications.

Is there any portion of your province into which, by reason of the want or the badness of the roads or other means of access, or of local or temporary disturbing causes of weather, &c., it might be impossible or difficult for unassisted trade in time of scarcity to throw enough grain to feed (say) one quarter of the population for six months? If there is such a part, state where it is, what is its area and population, and what are the special difficulties to be overcome, and how they might best be removed - - page 497.

22. Telegraphic Communication.

To what extent has telegraphic communication been established between the chief towns of your province? Having in view the value of rapid communication in time of distress, are there any important lines which it might be desirable to construct? - - - - - - - - page 502.

23. Denudation of Forest Lands.

Has there been within the historic period any sensible denudation of the forest in, or bordering on, your province? Can it be tested by statistics showing over how much area forest or scrub jungle has been cut down? Can you state any specific facts which lead you to think that such deforestation has caused injurious effects in any way, either in respect to the fall of rain, or the abundance or permanence of water in streams, or wells, or the subsoil, or the denudation of the surface soil so as to render it unfit for cultivation? And what injury has been produced, and to what extent? Can you adduce any direct evidence that such injury as you think has been caused by the clearing of forest has been remedied by its reproduction? If you think the clearing has been injurious, what steps would you propose to take towards reboisement? Should it be done by artificial planting, or by conservation of the tract, so as to keep out cattle-grazing and fires? Can such conservation be effected without interfering with any vested rights of the people, or with their consent, if interference is necessary? Which of the two methods would be easiest, cheapest, quickest of operation, and most effectual? To what extent and on how large an area could either method be followed? - page 505.

24 and 25. Famine Mortality.

Can any estimate be made of the number and proportion of deaths which are the inevitable consequence of famine, not being due directly to starvation, but to such privations as adults in health can bear with safety, but which prove fatal to children or the old and sickly; or to such diseases as follow in the train of famine from eating unwholesome food, roots, berries, leaves, &c., or arise from other and obscure causes like cholera and fever commonly concomitant on famine? What statistics exist as to past famines to show the depopulation that they have caused, and how far it is due to an increased death-rate, to emigration, or to a decreased birth-rate? If any special census was taken after the famine, state whether any trustworthy information was obtained as to the different classes of population which have suffered most; whether the early stages of a famine affect certain classes more or less severely than its later stages; whether the loss of life has been greater among males or females, among adults or children, to what extent the birth-rate has been affected; and how far local influences, peculiarities of administration, or tenure, climate, soil, water, density of population, systems of cultivation, &c., have tended to mitigate or intensify the inevitable effects of scarcity.

If no such census was taken, state what information is to be got from the mortuary returns for the period embraced by the last famine in your province, as compared with those for ordinary periods, and what conclusions may be drawn from those returns - - - - - - - page 526.

26. LOCAL RESPONSIBILITY AND FAMINE EXPENDITURE.

It has been laid down by the Government of India as a settled principle that local financial responsibility should be enforced in the case of a famine as far as possible. With this view, special taxation has recently been imposed on the country, the proceeds of which the Government has proposed to apply as a mutual assurance fund which will be available for the benefit of the people on whom the calamity of famine may actually fall. But it has been recognised that it would be preferable if some portion of this taxation could be made more strictly local, both in its levy and its application to relief purposes. Can you suggest any way by which it might be rendered practicable to provide that where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefited by it under any system of taxation (in modification of or in substitution for that recently adopted and not in addition to it) in a manner that should bring into operation a sense of local responsibility, first, in the direction of securing the lives of the people, and second, of protecting them from unnecessary expenditure on relief? How could such a principle be applied to a smaller area than that of a province or presidency? Could the expenditure in a single district or subdivision of a district be recovered from that district or subdivision by such special taxation wholly or in part, or under any special circumstances, or in reference to any class of the community requiring relief, leaving a smaller or larger portion of the charge to be made good from the province or presidency at large, or from the resources of the Government of India? Could any plan be suggested under which, subject to similar limitations, a municipality might be required to bear the cost of feeding its own poor? What kind of special local taxation should be adopted for this purpose? What would be the probable effect (1) on the minds of the people, (2) on the temper of officials, of the knowledge that the cost of famine relief expended on their behalf or by them would have to be recouped by local taxation? Is there any reason to suppose that the sense of local responsibility, if it could be brought to bear, would not operate beneficially in the case of relief of the distressed portion of the population in India? - - - - page 534.

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The Cotton Commissioner		Q. 19, p. 481.
Mr. A. J. Dunlop	Assistant Commissioner	Q. 1, p. 25. Q. 3, p. 79. Q. 4, p. 141. Q. 5, p. 154. Q. 6, p. 168. Q. 7, p. 196. Q. 10, p. 340. Q. 11, p. 357. Q. 13, p. 391. Q. 14, p. 411. Q. 15, p. 427. Q. 16, p. 440. Q. 17, p. 459. Q. 18, p. 470. Q. 19, p. 481. Q. 21, p. 501.
Colonel Elphinstone		Q. 6, p. 168. Q. 7, p. 197.
Mr. W. B. Jones	Commissioner	Q. 7, p. 197. Q. 9, p. 298. Q. 10, p. 341. Q. 13, p. 392. Q. 21, p. 501.
Mr. Liotard		Q. 7, p. 219.
Mr. A. C. Lyall	Secretary to Government of India, Foreign Department (formerly Commissioner, West Berar).	Q. 10, p. 340.
Major K. J. L. Mackenzie	Deputy Commissioner	Q. 4, p. 142. Q. 6, p. 168. Q. 7, p. 197. Q. 11, pp. 357, 358. Q. 15, p. 427.
Lieutenant-Colonel H. C. Menzies.	Deputy Commissioner	Q. 4, p. 142. Q. 6, p. 168. Q. 7, p. 197. Q. 11, p. 357. Q. 15, p. 427. Q. 15, p. 427.
Colonel W. Nembhard	Late Commissioner, East Berar.	Q. 3, p. 79. Q. 4, p. 141.
Sri Krishna Narhar	Extra Assistant Commissioner.	Q. 9, p. 296.
Major H. C. A. Szczepanski	Deputy Commissioner	Q. 6, p. 168. Q. 7, p. 197. Q. 9, p. 296. Q. 11, pp. 357, 358. Q. 15, p. 427.

BOMBAY.

Colonel W. C. Anderson	Commissioner of Survey	Q. 6, p. 169. Q. 7, p. 199. Q. 10, p. 344. Q. 11, p. 358. Q. 13, p. 392. Q. 14, p. 412. Q. 26, p. 541.
Mr. T. Chambers	Meteorological Reporter	Q. 1, p. 25.
Mr. Charles	Collector, Dharwar	Q. 26, p. 542.
Mr. Erskine	Commissioner, Northern Division.	Q. 7, p. 199. Q. 26, p. 542.
Colonel Haig, R.E.		Q. 20, p. 495.
Surgeon-Major Hewlett, C.I.E.	Acting Sanitary Commissioner in 1876 and 1877.	Q. 24, 25, p. 532.
Colonel Jenkin Jones, R.E.	Superintending Engineer, Central Division.	Q. 18, p. 470.
Mahadeo Wasudeo Barvé	Member of Famine Commission.	Q. 9, p. 301.
Mr. Norman	Collector, Poona	Q. 26, p. 541.
Mr. W. G. Pedder, C.S.	Secretary, Revenue Department, India Office (formerly Settlement Officer, Guzerat, Superintendent of Revenue Survey, Khandesh, &c.).	Q. 6, p. 169. Q. 10, p. 344. Q. 11, p. 358. Q. 26, p. 542.
Mr. J. B. Peile, C.S.	Member of Famine Commission.	Q. 1, pp. 25, 27. Q. 3, p. 82. Q. 4, p. 142. Q. 5, p. 154. Q. 6. p. 168. Q. 7, p. 197. Q. 8, p. 233. Q. 9, p. 303. Q. 10, p. 343. Q. 11, p. 358. Q. 13, p. 363. Q. 15, p. 427. Q. 16, p. 441. Q. 17, p. 461. Q. 19, p. 482. Q. 21. p. 501. Q. 22, p. 504.
Mr. Percival	Sholapur	Q. 10, p. 343. Q. 20, p. 512.
Lieutenant-Colonel W. Peyton.	Conservator of Forests, Southern Division.	Q. 23, p. 517.
Mr. Porteous	In charge, Kaira	Q. 18, p. 471. Q. 7, p. 197.
Mr. Propert	Collector, Khandesh	Q. 10, p. 343. Q. 7, p. 198.
Mr. Ramsay	Collector, Kaladgi	Q. 26, p. 541.
Mr. E. P. Robertson	Commissioner, Central Division.	Q. 6, p. 169. Q. 7, p. 198. Q. 10 p. 344. Q. 19, p. 483.
Mr. Shuttleworth	Conservator of Forests, Northern Division.	Q. 23, p. 514

Mr. Spry	Collector, Kaladgi	Q. 26, p. 541.
Mr. Wallinger	Deputy Conservator, Poona	Q. 23, p. 517.
Major-General St. Clair Wilkins, R.E.	Superintending Engineer, Southern Division.	Q. 18, p. 471. Q. 19, p. 482.

SINDH.

Colonel M. R. Haig	Settlement Officer	Q. 1, p. 29. Q. 3, p. 84. Q. 5, p. 155. Q. 6, p. 170. Q. 9, p. 307. Q. 10, p. 345. Q. 11, p. 359. Q. 13, p. 393. Q. 18, p. 472. Q. 19, p. 483. Q. 20, p. 495.

MADRAS.

Lieutenant-Colonel Beddome	Conservator of Forests	Q. 23, p. 520.
Board of Revenue		Q. 1, p. 30. Q. 3, p. 84. Q. 4, p. 144. Q. 5, p. 155. Q. 6, p. 170. Q. 7, p. 200. Q. 8, p. 233. Q. 10, p. 346. Q. 11, p. 359. Q. 12, p. 363. Q. 13, p. 393. Q. 14, p. 413. Q. 15, p. 428. Q. 16, p. 441. Q. 17, p. 462. Q. 18, p. 472. Q. 19, p. 483. Q. 20, p. 495. Q. 21, p. 501. Q. 22, p. 504.
Surgeon-Major W. R. Cornish.	Sanitary Commissioner, Madras.	Q. 24, 25, p. 532.
Mr. W. S. Foster	Collector, Godavery	Q. 23, p. 519.
Mr. H. Goodrich	Collector	Q. 9, p. 308.
Mr. Gordon	Bellary	Q. 23, p. 518.
Mr. J. G. Horsfall	Acting Collector, Kistna	Q. 23, p. 520.
Mr. Liotard		Q. 7, p. 203.
Mr. Logan	Malabar	Q. 23, p. 519.
Mr. J. Pennington	Collector, Tinnevelly	Q. 23, p. 518.
Mr. J. F. Price	Collector, Chinglepul	Q. 23, p. 518.
Mr. Price	Cuddapah	Q. 9, p. 308.
Sir W. R. Robinson, K.C.S.I.	Member of Council	Q. 23, p. 518. Q. 26, p. 543.
Mr. Webster	Coimbatore	Q. 23, p. 520.
Mr. W. Wilson	Director of Revenue Settlements.	Q. 9, p. 308.

MYSORE.

Captain C. Bowen, R.E.	Officiating Superintendent Engineer.	Q. 18, p. 473.
Mr. F. Harman	Superintendent	Q. 6, p. 174. Q. 7, p. 201.
Colonel A. Hay	Commissioner, Ashtagram Division.	Q. 1, p. 36. Q. 9, p. 310. Q. 14, p. 417.
Major W. Hill	Deputy Commissioner, Shimoga.	Q. 9, p. 310.
Mr. Krishnaiengar	Deputy Commissioner, Kolar	Q. 11, p. 361. Q. 14, p. 417. Q. 15, p. 429. Q. 19, p. 485. Q. 23, p. 522.
Mr. J. Lacey	Assistant Commissioner, Bangalore.	Q. 5, p. 156. Q. 16, p. 444.
Mr. Liotard		Q. 7, p. 217.
Mr. G. F. Meiklejohn	Assistant Superintendent, Revenue Survey.	Q. 12, p. 363. Q. 17, p. 463.
Colonel J. L. Pearse	Commissioner, Nundidrug Division.	Q. 9, p. 309. Q. 10, p. 348. Q. 14, p. 417. Q. 24, 25, p. 533.
Mr. L. Ricketts	Deputy Commissioner, Bangalore.	Q. 6, p. 174. Q. 7, p. 201. Q. 11, p. 360.
Captain G. J. Van Someren	Conservator of Forests	Q. 23, p. 523.

RAJPUTANA.

Captain D. W. K. Barr	Political Agent, Marwar and Jeysalmere.	Q. 1 p. 38. Q. 5, p. 156. Q. 7, p. 201. Q. 9, p. 311. Q. 17, p. 463. Q. 18, p. 474.
Colonel W. H. Beynon	Political Agent, Jeypore	Q. 16, p. 444. Q. 18, p. 474.
Lieutenant-Colonel T. Dennehy.	Political Agent, Dholpur	Q. 3, p. 94. Q. 4, p. 146. Q. 10, p. 348.
Captain V. E. Law	Political Agent, Alwur	Q. 3, p. 93. Q. 4, p. 146. Q. 13, p. 396.
Mahadeo Wasudeo Barvé	Member of Famine Commission.	P. 323.
Deputy Surgeon-General B. Moore.		Q. 1, p. 38. Q. 4, p. 147. Q. 18, p. 474.
Major P. W. Powlett	Political Agent, Kotah	Q. 3, p. 94. Q. 4, p. 147. Q. 7, p. 202. Q. 10, p. 348. Q. 13, p. 396. Q. 17, p. 163.
Mr. L. S. Saunders	Commissioner, Ajmere	Q. 4, p. 147. Q. 7, p. 202. Q. 12, p. 363. Q. 23, p. 525.
Mr. L. D. Spencer	Political Agent, Eastern States.	Q. 3, p. 94. Q. 4, p. 147. Q. 13, p. 396.
Mr. T. White	Assistant Commissioner, Ajmere.	Q. 7, p. 202. Q. 23, p. 525.

CENTRAL INDIA.

Lieutenant-Colonel P. W. Bannerman.	Political Agent, Baghelkhand.	Q. 7, p. 202. Q. 9, p. 312. Q. 10, p. 349. Q. 13, p. 397. Q. 18, p. 474.
Mahadeo Wasudeo Barvé -	Member of Famine Commission.	P. 323.
Lieutenant-Colonel Martin	- - - -	Q. 18, p. 474.
Mir Shahamat Ali -	Political Agent and Superintendent, Rutlam.	Q 7, p. 203. Q. 9, p. 312. Q. 10, p. 349. Q. 11, p. 362. Q. 12, p. 364. Q. 13, p. 397. Q. 18, p. 474.
Colonel W. Osborne - -	Political Agent, Bhopal -	Q. 13, p. 397.
Pundit Suroop Narain -	- - - -	Q. 10, p. 349. Q. 11, p. 362. Q. 13, p. 397.
Mr. Wingate - -	- - - -	Q. 1, p. 39. Q. 3, p. 94. Q. 4, p. 148. Q. 5, p. 157. Q. 6, p. 175. Q. 8, p. 236. Q. 11, p. 349. Q. 11, p. 362. Q. 12, p. 364. Q. 14, p. 417. Q. 15, p. 429. Q. 16, p. 444. Q. 17, p. 463. Q. 21, p. 502. Q. 23, p. 525.

HYDERABAD.

Mahadeo Wasudeo Barvé -	Member of Famine Commission.	P. 323.
Moulvie Mahdi Ali - -	Secretary to H.H. the Nizam's Government in the Revenue Department.	Q. 1, p. 39. Q. 3, p. 95. Q. 4, p. 148. Q. 5, p. 157. Q. 6, p. 175. Q. 8, p. 236. Q. 9, p. 236. Q. 9, p. 312. Q. 11, p. 362. Q. 13, p. 398. Q. 15, p. 430. Q. 16, p. 445.

ERRATA.

P. 348.—The reply to Question 10 is by Colonel Pearse.
P. 363.—The reply to Question 12 is by Mr. G. F. Meiklejohn.
P. 483.—Mr. Dharwar should be Mr. Charles, Dharwar.

APPENDIX.

CHAPTER I.—QUESTION 1.

What is the normal system of rain-fall in your Province? From what quarter does the rain come, and in what months does it fall? Give any returns you possess showing the average amount gauged in each month; and state whence they are obtained, and how the registers of rain-fall are kept. Within what limits can the rain-fall vary without doing serious injury? What is the amount of rain-fall for each month, and for the whole year, which, judging from past experience, you consider to be sufficient for agricultural necessities? What are the different agricultural operations depending on the due arrival of each of the expected monsoons or seasonal rains? What is the effect on the crops of the failure of any of these elements of rain-fall, and what is the combination of circumstances under which the worst results have been produced? So far as necessary, differences in the several districts should be distinguished and separate returns supplied for them.

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The rain-fall is registered at the head-quarters of each tahsíl and district. At the tahsíl offices the observations are made, and the registers written up by one of the native revenue clerks under the supervision of the tahsíldár. At the head-quarters of each district the observations are similarly made either at the tahsíl or sadar office.

At the great majority of these observing stations (aggregating about 150) the gauge used for registering the rain-fall is a cylindrical copper tube, into which the rain-fall is collected from a wide funnel. The depth of water in the tube is measured by a metal scale. The dimensions of the tube and the funnel are so adjusted that one inch of water in the tube represents a fall of one-tenth of an inch at the mouth of the funnel, that is to say, on the surface of the ground. At a few stations more elaborate gauges are in use.

In addition to these weekly reports by the land revenue establishments, a system of meteorological observations is carried out at the head-quarter medical dispensary of each district, and reported to a selected medical officer at Lahore, who fills the office of Meteorological Reporter to the Punjab Government. These observations are carried on with accurate instruments, and include, besides the rain-fall, humidity and temperature of the atmosphere, barometric pressures, and the wind directions; and are summarised in an annual report addressed to the Punjab Government.

It is noteworthy that the rain-fall reported by the land revenue establishments, though observed with rough instruments and by clerks on small pay, agrees well with the more detailed and scientific observations last described.

The rain-fall of the Punjab, like that of the North-West Provinces, is brought to it by wind currents from the east and south-east. A portion of the fall may be due to the south-west currents from the Indian Ocean; but so much of these as contribute to the Punjab rain-fall seem to strike the eastern currents at a point east of Delhi, and are deflected by and added to the latter.

It is a proverb all over the Punjab that the east wind brings rain. This is said both of the autumn and winter rains. I gather from Dr. Neil's report that his observations do not corroborate this fact in respect of the winter rains. But the fact is notorious, even in winter, that rain comes with the east wind; and I have no doubt that in due time meteorological observations will confirm and explain it.

The province has two well-marked rainy seasons; the autumn rains, which usually commence at the end of June and last into the middle of September; and the winter rains, which occur principally between January and March.

The average annual fall in each district, and more especially the average amount of the autumn fall, depends mainly on its distance from the base of the Himalayan tracts, which stretch from end to end of the province on its north-east side. The following table illustrates this. It shows the way the rain-fall of each doáb or delta decreases as we recede from the hills:—

From EAST — To WEST.

BETWEEN THE RIVERS JUMNA AND BEAS.						BETWEEN THE RIVERS BEAS AND RAVI.			BETWEEN THE RIVERS RAVI AND CHENAB.			BETWEEN THE RIVERS CHENAB AND JHELUM.			BETWEEN THE RIVERS JHELUM AND INDUS, AND DOWN WEST BANK OF INDUS RIVER.		
STATION.	Distance from Himalayan base.	Rain-fall.	STATION.	Distance from Himalayan base.	Rain-fall.	STATION.	Distance from Himalayan base.	Rain-fall.	STATION.	Distance from Himalayan base.	Rain-fall.	STATION.	Distance from Himalayan base.	Rain-fall.	STATION.	Distance from Himalayan base.	Rain-fall.
	Miles.	Inches.		Miles.	Inches.		Miles.	Inches.		Miles.	Inches.		Miles.	Inches.		Miles.	Inches.
Naraingarh	10	44	Dera	0	54	Pathánkot	0	54	Siálkot	25	39	Gujrat	30	29	Abbott-abad	0	46
Umballa	26	35	Hoshiárpur	32	34	Gurdáspur	25	31	Daska	40	30	Phálian	55	26	Haripur	16	36
Pipli	56	26	Jullundur	55	30	Batála	44	27	Gujránwála	55	26	Bhera	80	16	Rawalpindi	32	32
Kaithal	70	18	Nakodar	72	26	Amritsar	65	23	Háfizabad	80	20	Shahpur	110	18	Fátahjang	50	–
Hissar	135	17	Ferozepore	112	20	Kasur	110	22	Sharakpur	100	19				Talagang	100	14
Sirsa	135	14	Muktsar	144	13	Chunián	140	22	Chiniot	130	13				Miánwáli	145	10
						Dipálpur	170	8	Jhang	170	10				Dera Ismail-Khan.	200	8
						Montgomery	200	9							Leiah	260	8
						Mooltan	290	6							Muzaffargarh	310	6
															Rájanpur	400	–

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The winter rains contribute but a small portion of the total annual fall. In the Delhi and Umballa divisions they are usually 4 inches out of 30; in the submontane tracts of the Jullundur, Amritsar, and Lahore divisions they are 5 out of 30 and 35; or in the parts more distant from the hills 3 out of 20. In the northern part of the Rawalpindi division they increase to 7 out of 30. At Sirsa and Shahpur, far removed from the hills, they are 2 out of 13; and at Mooltan 1 out of 6. Yet owing to the low temperature of the winter, these small falls of rain in all but the southernmost portion of the province raise crops equal in value to those grown under the fierce sun and heavy rains of the autumn.

It is not possible to state exactly, or nearly exactly, how many inches of rain are needed in each month. On the other hand, the description of the years of scarcity which have occurred in the Punjab, and of the seasons at which rain is essential to each crop, or injurious to it, go far to supply the information required. Briefly summarised, that information is as follows:—For the autumn (kharif) crop the most favourable conditions are falls of rain commencing at the end of June and lasting, with breaks not exceeding a fortnight, into the middle of September. The total fall is not so important as the repetition of moderate falls at the intervals stated.

The most unfavourable conditions consist in the failure of the last half of the autumn rains in July and August.

The seasons in the Punjab are so adjusted that the later rains of the autumn (August to October) both ripen the autumn crops and prepare the ground for the rabi sowings. If these rains fail, two crops are lost at one blow. Both in 1860 and 1868 it was this which caused the famine. The natives say that the loss of the kharíf harvest by itself does not cause famine, but that famine always comes in with the kharíf, and goes out with the kharíf. That is to say, the kharíf may fail owing to short rains at the sowing time; but if the later rain fails absolutely, the rain which both ripens the autumn millets and on which the wheat is sown, the country loses at one blow a year's food supply. In the same way famine goes out with the kharíf, because these late autumn rains bless the country with two crops at once.

Dr. Neil.

January.—This is the coldest month of the year throughout the Punjab, and usually more so than November and December. The winds usually blow from north-westerly directions, but, as in the cold season generally, vary greatly.

The rain-falls during this month, as indeed during the cold weather generally, are due to local influences, local areas of low pressure, whither wind currents of different degrees of saturation and different temperatures blow and mingle. A good instance of this was shown in January 1874, on the 21st and 22nd of the month. On the north-west frontier the wind had been blowing previously mostly from northerly and easterly directions; while on the north-eastern boundary, from below and through the district of Ludhiana, the wind came from westerly sources. These currents, impinging and uniting, deflected towards the more eastern districts, and there, the regions being colder, precipitated their moisture.

A cold wind from the hills meeting a warmer current from the plains will serve to produce a depression of temperature with consequent condensation of moisture, and a continuance of this will bring the moisture below the dew point or point of saturation, and a fall of rain will be the result. The range of rain-fall for January extends from a maximum of four inches to a few drops. The submontane districts are usually the most liberally supplied, from causes described above.

February.—This month is warmer by an average of 5° or 6° than January. The winds, though variable, blow mostly from northerly and westerly directions, and the rains are due mostly to the same causes as I have mentioned in my remarks for the previous month. The largest rain-falls occur in the submontane districts. The largest fall during this month in Lahore (4·67 inches) occurred in 1877; so also in Rawalpindi and in Siálkot in the same year. In the more eastern districts the fall does not usually reach one inch, and the same remark applies to the more southern districts.

March.—The mean temperature of this month exceeds that of February usually by about seven degrees. The temperature in the sun's rays begins to increase greatly. The winds, still variable, begin to blow more frequently from easterly sources as the heat of Northern and Western India begins to increase, but northerly and westerly currents still prevail. The average rain-fall at Lahore rarely exceeds two inches; and seldom, indeed, reaches that amount. During this month of 1868 and 1869 the rain-fall in the submontane districts and a few others was very considerable, and was due to a prevalence of wind currents blowing towards the great north-eastern boundary, and being there met by counter-currents. In March 1871, these same districts had very little rain, and I account for this by the fact that the westerly currents were so powerful that they carried their moisture far into the mountains beyond the districts noted. The average amount of rain in the more southern districts, such as Delhi, Gurgaon, Hissar, does not usually exceed an inch. In the submontane districts the fall is more plentiful, from the reasons given above, and in the western and north-western districts the fall is also usually tolerably plentiful. This will depend of course greatly upon whether the area of low pressure may shift towards them, and thus cause a rush of wind currents in that direction.

April.—The mean temperature of this month exceeds that of March by about 11°. The wind begins to assume more southerly directions, but is still variable. The rain-fall varies very much throughout the province. In the more southern districts and on the north-western frontier it seldom exceeds one inch, and in many places does not even reach that amount. The north-eastern districts usually fare better, though occasionally very badly.

May.—This month has a mean increase of about 10° over that of April. The amount of rain varies very much in different years during this month in the Punjab. In the years 1869, 1870, 1871, this month was almost rainless, and in 1874, 75, 76, 77, very little fell, at random periods. In the years 1867 and 1872, and notably in the present year, the falls for this month have been very considerable. On turning to my report for 1869, I find the following remark:—"The most remarkable difference in the amount of "rain is observable in May as compared with that of "the same month for the two previous years, during "which it so happened that a certain amount of rain "fell in almost every district in the province. The "barometer showed greater fluctuations of pressure "during the month in 1867 and 1868." It is to be observed that the month of March of 1869 was unusually rainy which, due, as the cold weather rains are, to local influences, principally accounts, partly at least, for the scanty fall in the May following.

Turning to the table of "Directions of Wind," for 1869, I find that the winds were with unusual frequency easterly, as for example at Siálkot, and this will account for the absence of rain in the submontane districts. The wind currents were blowing towards the area of low pressure. Turning to the report for 1872, I find that westerly currents were more prevalent; the area of low pressure had therefore been more eastward.

June.—This is the hottest month of the year. The amount of rain which falls during this month is subject to very great variation. In the report for June 1873, I made the following observations:—"It is "most interesting to compare this month's (June 1873) weather results with those of the same month for the past four years." In my report for June 1871, I wrote as follows:—"The rain-fall during this month was unusually large in the eastern and south-eastern districts and in the hills. The cause of this was the almost entire prevalence of the south-east winds. These south-east rain-bearing winds, blowing as they did along the great mountain boundary of the Himalayas, had most of their moisture precipitated to the east of 74° longitude. The south-west winds to the west of this, on the other hand, meeting seldom with any resistance from counter-currents, blew onwards towards the north-western boundary of the province, over a large tract of arid country, and had little moisture left in them by the time they reached the great Sulimán range as south-eastern deflected currents. The districts north of the 33rd parallel fell short of their usual supply of rain, and it is most likely that, with the same predominance of south-easterly winds, this state of matters will always maintain, as it will also in the case of districts lying to the west of 74° longitude. As the Gangetic current waxes stronger or otherwise over the south-western, the greater or less will be the fall of rain in June."

Quoting still from the report of 1873, "The table of results shows at a glance in how far the above remarks are confirmed by subsequent observation. Take for example Ludhiána. In June 1871, when east and south-east prevailed, there was a fall of over 10 inches of rain; while in 1873 for the same month there was a fall of only a fraction of an inch. With the other years for the same month there will be found shades of difference which correspond to the prevalence of the rain-bearing currents or otherwise. The same remark applies to Siálkot, Lahore, and Rawalpindi.

July.—Owing to the rains this month is slightly cooler than June, and the daily range of temperature is less. As a general rule, the monsoon rains do not set in in the Punjab, before the end of the first week of this month. At all events this is usually the case with the districts *north* of the 30th parallel. As regards the amount of rain which the province will receive during this month and the following, we have tolerably definite and trustworthy data at command. Depending as the rain-fall is upon monsoon influences, and recognising the fact that two rain-bearing currents, south-western and south-eastern, affect the eastern and northern parts of the Indian Peninsula, we have only to discover by observation whether the current is more or less powerful than the other. Of the two monsoon currents, the south-east or Gangetic current is the one upon which the Punjab depends most for rain. In my report for July 1873, I wrote as follows:—"A considerable amount of rain fell in most of the eastern districts, and the obvious cause was the prevalence of the rain-bearing currents from the east and south-east."

The fall was observed to be most copious in the more eastern districts, in some of which the fall nearly doubled the mean of previous years for the same month. If we compare the falls of July 1869 and 1873, we notice that north of latitude 30° the fall for the *former* period far exceeded that of the latter, while in the districts *south* of that parallel, the rains were, in 1869, comparatively scanty. Thus, at Delhi the fall in July 1869 was only 6·5 inches; while that of July 1873 in the same station was nearly three times that amount. On examining the wind charts for these periods, we find that during the early part of the month of 1869 the winds blew most frequently from westerly directions; and it was not till the middle of the month that rain fairly set in with the change of wind to south-east. Again, as regards July 1874, I wrote:—"Had the south-west monsoon been *more* powerful, less rain would probably have fallen in the districts north of the 30th parallel and to the east of the 73rd degree of longitude, inasmuch as to the west of this lies a dry arid country, in which moisture (in the south-west wind) is absorbed."

August.—The temperature of this month differs but little from that of July. The rain which falls depends of course upon monsoon influences. In this month of 1868, there was a great scarcity of rain in the more southern, and in many of the submontane districts. Take, as example, Delhi and Siálkot. In 1867 Delhi had 7·4 inches in this month, and Siálkot 26·2; whereas in 1868, for the same period, Delhi had *only* 0·3 *inches*, and Siálkot 9·7. These results were due entirely to the greater frequency and force of the easterly and south-easterly currents in the former period than in the latter.

September.—The weather phenomena for this month are also under monsoon influences. The south-easterly currents begin by this time to lose their force, and the south-west monsoon prevails. In my report for 1873 I wrote as follows:—"The south-west monsoon from the Arabian Sea meets with little obstacle, as it blows over the comparatively arid plains to the east of the Indus river; and as it blows onwards towards the great Himalayan boundary, the failing south-east current is unable to deflect it. These facts show why there are later rains in the north-eastern districts than in those further to the south. A reference to a map will show that the remaining moisture of the combined currents gets dammed up, as it were, against the great mountain boundaries, and falls as rain in the valley bounded on the west by the great Sulimán range, on the north by the hills north of Peshávar, and to the east by the continuation of the Himalayan range."

October.—During the early part of this month the monsoon breaks up, and a little rain falls throughout the province, sometimes in considerable quantity in the submontane districts. This fall sometimes does not occur till about the middle of the month. Westerly winds are most frequent. The area of lowest pressure, about this period, seems to be along the Indus valley.

November.—This is the least rainy month of the year in the Punjab. A little falls occasionally in the north-western area of low pressure. The winds are variable, but most frequently westerly.

December.—The winds are very variable during this month, but westerly currents are most frequent. A little rain usually falls about the end of the month, called the Christmas rains.

The following table is intended to show how much the mean temperature of each month differs in increase or decrease from that of its predecessor. A glance at such a summary will show that during the first six months, January to June inclusive, the greatest monthly increase of temperature occurs in April and May, and the greatest decrease during the latter half of the year, in November. January is the coldest month, and June the hottest.

STATIONS.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Lahore - - - -	53·96	60·35	68·74	80·96	89·14	94·39	90·31	89·68	86·41	77·93	65·21	56·25
Rawalpindi - - -	50·75	55·83	63·59	74·56	85·48	93·27	90·32	87·54	83·76	74·02	61·90	53·60
D. I. Khan - - -	52·77	58·75	67·02	78·57	88·77	95·06	93·48	90·83	87·08	75·74	63·35	54·41
Siálkot - - -	54·09	59·72	67·19	78·71	88·78	93·11	88·33	87·16	85·65	76·96	63·88	54·73
Mean of the four stations	52·89	58·66	66·63	78·20	88·04	93·96	90·61	88·80	85·73	76·16	63·59	54·75
Mean difference between each month - -	..	+ 5·77	+ 7·97	+11·57	+9·84	+5·92	−3·35	−1·81	−3·07	−9·57	−12·57	−8·84

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NORTH-WEST PROVINCES AND OUDH.

RAIN-FALL OF THE N.-W. PROVINCES AND OUDH.

The first subject to be treated will be the history of rain-fall observations in the North-Western Provinces, and their general character as regards accuracy. Then will follow the two chief sections of the report, dealing with the detailed distribution of rain-fall in space and in time respectively. The tables showing the average monthly and annual rain-fall at a large number of stations will be relegated to an appendix.

History of Rain-fall Observations in the N.-W. Provinces and Oudh.—The first attempt at a systematic record of the rain-fall of the North-West Provinces was made in the year 1844. In earlier years various independent observers from time to time registered the rain-fall and other meteorological phenomena observed at the stations where they resided, but their observations were generally for such short periods, and so desultory in character, as to be of very little value in subsequent investigations. A notable exception to this general rule was the meteorological register kept for two years at Benares by Mr. James Prinsep, and published in the volume of the *Asiatic Researches* for 1823. Mr. Prinsep was able to deduce from his observations more accurate values for the temperature, pressure, and humidity of the air, and for the daily and annual ranges of the barometer and thermometer at Benares, than were given by any subsequent observations until a regular meteorological observatory was established at that station in 1867. As regards rain-fall, however, a period of two years is much too short to allow a correct average to be deduced from the observations, and therefore Mr. Prinsep's figures can furnish little or no information that would be of value in drawing up this report.

After the great famine of 1838, the attention of the Board of Revenue appears to have been directed to the desirability of obtaining numerous observations of rain-fall from every district in the province, to enable the members of the Board to estimate the probable character of the crops of each year, and the revenue-paying power of the cultivators. With this object in view, a rain-gauge was set up in the beginning of 1844 at every tahsil or revenue subdivision of a district. A year or two later the number of gauges was increased considerably, one being placed at nearly every police station or thána. Thus organized, the system of observation continued in operation down to the year of the mutiny. The registers were sent into the office of the Board of Revenue, and were published, either in full or as an abstract, in the Board's annual reports. An abstract of all the observations taken between May 1844 and October 1850 was also published in a separate form, but the date of publication (probably about 1853 or 1854) is not stated.

During the mutiny year, 1857, and the three following years, owing to the disturbed state of the country, no record of the rain-fall was kept at any of the revenue stations in the plains, and the records for the year preceding the mutiny, 1856, seem, as a rule, to have been lost. From the Himalayan districts of Kumaun and Dehra Dun, to which the rebellion did not extend, we have a few registers for the years 1856–60, and these help to fill up the break of four or five years which exists in the registers for all the other stations.

Rain-fall observations were re-commenced generally over the North-Western Provinces in 1860, and in Oudh a beginning was made a year or two later. At first gauges were set up at a few of the police stations as well as at the tahsils; but experience having shown that the observations made by the police were generally of little or no value, they were very soon abandoned. Abstracts of the weekly rain-fall returns for 1860–61, and the two following years, were published by the Board of Revenue; but many of the figures for these years were obviously inaccurate, and it was only about the beginning of 1864 that fairly trustworthy observations from the outlying statio began to be received. Since then weekly returns rain-fall have been regularly published in the *Gover ment Gazette.* In Oudh many of the observatio continued to be of a doubtful character three or fo years longer, but in 1868 they began to be check by Dr. Bonavia, of the Oudh Department of Scien and since then they have been much more accurate.

In drawing up the tables of average rain-fall giv in the appendix, the records for the North-Weste Provinces have been assumed to begin with 1864, the first year after 1864 in which the observatio appeared to be fairly accurate. Similarly, in Ouc the records are supposed to commence in 1868, thc of earlier date being ignored on account of t numerous errors they contain. In the case of t sudder station of each district in the North-Weste Provinces, the whole of the observations having be taken under the immediate supervision of the C lector, may be considered equally accurate, and f these stations the average rain-fall for the whc period of observation, as well as for the fifteen yea (1864–78), is given in the table. It will be observ that in very few cases is there any consideral difference between the two averages.

Rain-gauges used.—Before proceeding to discu the distribution of the annual rain-fall over t provinces, it may be well to state what is knov regarding the accuracy or inaccuracy of the gaug by which the rain-fall has been measured. Wh form of gauge was employed before the mutiny I not know; but since then almost all the instrumen in use have been constructed on the principle knov as Fleming's. A gauge of this kind consists of wide conical funnel, ending below in a cylindric tube of smaller diameter. In this tube moves a flo carrying a graduated rod, each division of which corresponds to a tenth of an inch of rain. The instruments have been made at the Roorkee workshops, and, as a rule, they are capable of giving fairly accurate measurements if properly used. One defect they all have is that they require a certain quantity of water to raise the float and bring the zero point of the measuring rod up to the fiducial mark. This quantity varies with each instrument, and, in most cases, no allowance has been made for it. Another cause of error is the circumstance that the rod is graduated only to tenths of an inch, and the nearest division simply is recorded at each reading. Light falls of rain under ·05 of an inch are therefore neglected; and, as these are by no means rare, especially in the cold weather months, the result is that, on the average, the observed figures are always three or four per cent. below the truth.

No attempt has been made to correct this error in the observations; but the tahsílí returns, with all very improbable figures carefully weeded out, have been taken as they stood. In order to obtain more correct averages than those given, seven per cent. might be added to all the figures for the months from November to May, and three per cent. to those for the remaining months. Neglecting this small error, and assuming that the observations have been taken with a moderate degree of care, one sees that the data furnished by the 233 stations, situated on the plains within the bounds of the province, and whose rain-falls are given in the appendix, are sufficiently numerous to afford as exact a knowledge of the distribution of rain over the plains districts of these provinces as could at present be obtained for any European country of equal area.

SECTION I.—DISTRIBUTION IN SPACE.

Rain-fall Maps.—The best way to obtain a correct notion of the geographical distribution of rain-fall, temperature, or any other meteorological phenomenon, is to take a map and mark on it the figures recorded at every observing station, and then to sweep lines through all those places where the figures are nearly equal. In this way the curves on the maps accom-

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panying this report have been drawn, each line passing through places whose rain-fall is represented by the figures attached to the line. In drawing the lines of equal rain-fall, two or three stations have been left out of account, because their rain-fall totals differ more than ten per cent. from the averages for the surrounding stations, while no obvious reason, such as proximity to a mountain, can be assigned for such a difference. The annual totals for these stations are marked with a note of interrogation. The figures are always considerably less than the means for the surrounding stations, and the error is probably due to the observers neglecting to record light falls of rain.

A map constructed in this way represents as accurately as possible the average distribution of the rain-fall over a plain country like the Doab, Rohilkhand, and Oudh, even when the observing stations are 20 or 30 miles apart; but in hilly countries, such as Bundelkhand, Baghelkhand, and the southern parts of the Mirzapur district, the stations would require to be very numerous, in order that the map might be anything better than a rough approximation to the truth. In a mountainous country like Kumaun and Garhwal, any attempt to draw detailed isohyetic lines would be only misleading. The lines of equal rain-fall on these maps are accordingly confined to the plains and the hill country south of the Ganges; the rain-fall figures for each of the Himalayan stations being printed separately, close by the name of the station.

The earliest rain-fall maps for the North-Western Provinces appear to have been drawn up in 1864, and were published with the report of the Board of Revenue for 1863–64. In the *Punjab Government Gazette* for the 19th December 1863, Mr. E. Prinsep, the Settlement Officer of Ambala, had published a paper in which he showed that the districts of the Punjab might be arranged in zones of nearly equal rain-fall, parallel to the Himalaya; the zone of heaviest rain lying along the foot of the mountains, and that of least rain bordering on the Bikanir desert. At the suggestion of Mr. G. Batten, then Secretary to the Board, two maps were drawn up to show whether anything like a similar distribution of the rain-fall obtained in these provinces,—one representing the rain-fall of 1863–64, and the other the average rain-fall of nine years (1844–45 to 1852–53). The Board's report says that no satisfactory conclusion could be drawn from these maps regarding Mr. Batten's suggestion, because the data were not perfectly trustworthy. Owing to the absence of observations from Oudh, which lies in the heart of the North-Western Provinces, as well as to the way in which the maps were drawn and coloured, it would have been very difficult to see whether there was any truth in Mr. Batten's surmise, however accurate the observations might have been. The mistake in colouring consisted in giving every district the same tint throughout, as if its rain-fall were everywhere the same. Thus the parallelism of the rain-fall zones with the Himalaya was completely masked, because the district boundaries seldom or never run parallel to the mountains.

Geographical Distribution of the Annual Rain-fall.—A glance at the map for the whole year will show that Mr. Prinsep's conclusion regarding the distribution of rain-fall in the Punjab may be extended (as has already been shown by General Strachey and other writers) to the North-Western Provinces and Oudh. In the western half of the area the lines of equal rain divide the Doáb and Rohilkhand into strips which would be nearly parallel to the mountain axis were it not that they generally widen out towards the east, and contract as they extend westwards. This is but another way of saying that the amount of the annual rain-fall varies, not only with distance from the Himalaya, but with distance from the warm sea from which the moist winds usually blow. To the south of the Jumna the rain-fall again increases. The cause of this increase will be discussed further on.

In the eastern half of the provinces, however, the parallelism of the rain-fall zones with the Himalaya can only be traced in the districts lying to the north-east of the Ghágra river. An irregular quadrilateral, occupying the lower parts of the drainage areas of the Gumti and Sai rivers, and extending north-westwards nearly as far as Lucknow and Bára Banki, has an average rain-fall over 40 inches, while the rain-fall of the greater part of the Fyzabad district on the north-east and of the Azamgarh and Ghazipur districts to the east, as well as that of south Behar, is under 40 inches. Immediately to the west of this area, in the Rae Bareli, Unao, Fatehpur, and Cawnpore districts, the rain-fall averages only about 30 inches, while farther west, in the districts of Etawah and Mainpuri, it is over 30 inches. It thus seems as if a portion of the rain that would fall in Rae Bareli, Unao, Fatehpur, and Cawnpore, were the easterly winds constantly blowing, is compelled for some reason or other to fall 50 miles to the east of these districts.

South of the Jumna the rain-fall again increases, and in the eastern half of the map of the lines of equal rain will be seen to run generally parallel to that river, or its continuation the Ganges. In the district of Shahabad, between the Ganges and the Son, there is a long narrow strip of country, with an annual rain-fall of over 45 inches. This is probably due to the influence of the Kaimur hills which have here to be surmounted by the south-easterly winds from the Bay of Bengal. Farther to the west, in south Mirzapur and Rewah, the prevailing winds of the rainy season are westerly, and the heaviest rain falls on the north-west side of the Kaimur range.

The decrease of rain with distance from the Himalaya up to a certain limit, and its increase beyond that limit, as well as the gradual decrease on passing from south-east to north-west, are perhaps more clearly seen when the map is divided into equal rectangular sections by lines parallel and perpendicular to the Himalaya and the average rain-fall of each section is calculated as in the following table.

MEAN ANNUAL RAIN-FALL of the NORTH-WESTERN PROVINCES and OUDH in ZONES parallel to the HIMALAYA.

Distance, in miles, from the Foot of the Hills.	On Cross Strips through										
	Saharanpur.	Bijnor.	Moradabad.	Bareilly.	Sháhjahánpur.	Kheri.	Bahraich.	Fyzabad.	Basti.	Parauna.	Mothari.
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
0 to 25 - -	40·7	46·6	49·5	57·7	?	?	?	?	?	?	?
25 „ 50 - -	31·0	36·8	40·5	46·3	46·8	46·0	44·5	47·4	46·7	46·6	46·9
50 „ 75 - -	28·9	28·8	36·6	42·0	38·4	36·4	40·2	40·5	41·0	41·7	44·8
75 „ 100 - -	23·5	23·2	28·3	32·2	33·7	33·7	37·0	42·5	38·4	37·6	43·8
100 „ 125 - -	25·5	23·5	24·6	30·9	29·5	31·3	33·9	35·0	40·0	36·4	38·6
125 „ 150 - -	—	24·5	23·7	30·4	29·9	31·3	31·3	37·3	35·7	38·0	38·5
150 „ 175 - -	—	—	26·0	27·6	32·4	31·2	34·0	35·2	39·5	38·2	—
175 „ 200 - -	—	—	26·0	27·0	29·7	31·0	38·5	39·8	41·7	41·6	—
200 „ 225 - -	—	—	—	32·8	30·1	32·9	38·8	48·5	63·6	44·6	—
225 „ 250 - -	—	—	—	—	30·4	35·1	—	—	—	—	—
250 „ 275 - -	—	—	—	—	33·4	?	—	—	—	—	—
275 „ 300 - -	—	—	—	—	37·1	38·6	—	—	—	—	—
300 „ 325 - -	—	—	—	—	37·8	41·1	—	—	—	—	—

The heavy rain in south-eastern Oudh is indicated by the figures for the strips through Basti and Fyzabad at distances of 75 and 100 miles from the hills.

Reasons of the observed Distribution.—The causes of the observed distribution of rain over the upper half of the valley of the Ganges are not far to seek or difficult to understand. In the first place, the rain-fall gradually diminishes on proceeding up the valley from south-east to north-west, because the prevalent rainy winds are south-easterly. These winds come from the Bay of Bengal branch of the south-west monsoon current, and are in fact that portion of the current which is deflected from its normal course by the mountains north of Bengal, and by the indraught towards a region of low atmospheric pressure that occupies the centre and south of the Punjab during the rainy season. Since these winds are constantly parting with their moisture during their passage inland, it follows that the farther we proceed from the sea in the direction of the wind's motion the less will the rain-fall become.

Next it must be borne in mind, that though rain is sometimes precipitated from the lowest strata of the air, it more usually falls from clouds formed at a considerable height, and that in deducing the probable character of the rain-fall of any locality from a knowledge of the prevailing winds, the upper as well as the lower currents of the atmosphere must be considered. Now although the prevailing direction of the winds at stations on the plains near the foot of the Himalaya is nearly parallel to the axis of the range during the rainy season, it is very different at considerable elevations. At stations of 6,000 or 7,000 feet elevation above sea level, the mean direction of the wind for each month varies from west to south-east; the average direction for the whole year being nearly at right angles to the general line of the mountains. At greater elevations the winds are constantly south-westerly. At Dehra, 2,250 feet above the sea, or 1,400 feet above the neighbouring plain, the winds are north-westerly during a portion of the dry season; but in the rainy months they are there also at right angles to the direction of the mountain range. The directions of the mean winds for each month at several hill stations are given in the next table.

MEAN WIND DIRECTIONS at HIMALAYAN STATIONS.

Station.	Elevation.	January.	February.	March.	April.	May.	June.
	Feet.						
Dehra - - -	2,250	S. 72° W.	S. 67° W.	S. 79° W.	S. 74° W.	S. 58° W.	S. 66° W.
Ranikhet - - -	6,080	N. 89° W.	S. 62° W.	S. 52° W.	S. 66° W.	S. 63° W.	S. 69° W.
Darjiling - - -	6,930	S. 50° W.	S. 65° W.	S. 67° W.	S. 68° W.	S. 51° W.	S. 14° W.
Chakrata - - -	7,070	S. 29° E.	S. 56° E.	S. 20° E.	S. 57° W.	S. 42° W.	S. 53° W.
Leh - - - -	11,570	S. 8° W.	S. 11° W.	S. 28° W.	S. 22° W.	S. 40° W.	S. 52° W.

Station.	July.	August.	September.	October.	November.	December.	No. of Years' Observations.
Dehra - - -	S. 67° W.	S. 56° W.	N. 61° W.	N. 64° W.	N. 78° W.	N. 89° W.	9–10
Ranikhet - - -	S. 77° W.	S. 72° W.	S. 61° W.	S. 53° W.	S. 56° W.	S. 60° W.	6–8
Darjiling - - -	S. 12° E.	S. 13° E.	S. 23° W.	S. 48° W.	S. 38° W.	S. 38° W.	10
Chakrata - - -	S. 51° W.	S. 55° W.	S. 50° W.	S. 28° W.	S. 29° W.	S. 18° W.	6–8
Leh - - -	S. 57° W.	S. 55° W.	S. 29° W.	S. 37° W.	S. 27° W.	S. 17° W.	4

A current of air cannot continue to blow against an obstacle like the Himalayan mountain wall without being forced to rise upwards, and the upward motion will not be confined to the immediate neighbourhood of the mountains, but will commence at some distance to windward. In this way all that portion of the summer monsoon current which lies more than 2,000 feet or so above the plain will generally be found flowing up a gentle incline towards the hills. Of the lower stratum, which usually moves in a direction parallel to the mountains along their base, portions are deflected upward by every projecting spur and ridge inclined more or less nearly at right angles to the main chain. And even in this region southerly and south-westerly winds are not uncommon, for it is only the *mean* wind direction which is parallel of the mountain axis. During the summer monsoon, therefore, the whole of the southern slope of the Himalaya, and a broad belt of the plain at its foot, are occupied by a system of ascending atmospheric currents. A mass of air cannot, however, ascend in the atmosphere without expanding, and it cannot expand without pushing aside other air and occupying its place. In doing this a quantity of heat equivalent of the work done disappears, and the temperature of the ascending air is lowered. By an easy deduction from the mechanical theory of heat, it may be shown that in this way the temperature of dry air would be lowered one degree Fahrenheit for every 183 or 184 feet of elevation. Moist air would be cooled rather more slowly, but still, in an ascending stream, it would very soon acquire a temperature so low that a portion of its moisture must necessarily assume the form of cloud and rain. This cooling, consequent on expansion in an ascending current, is usually the immediate cause of rain. Wherever the ascending movement is most rapid, provided the supply of vapour be constant, there the rain-fall will be heaviest. Accordingly we find the greatest amount of precipitation along the lower slopes of the Himalaya, from which region the quantity diminishes towards the south-west because the ascensional movement becomes less and less rapid with distance from the obstacle. The amount of rain also diminishes on proceeding towards the inner and higher ridges of the chain, owing to the rapid exhaustion of the vapour. What the law of this diminution is will be considered further on.

Any other circumstance that tends to make moist air or vapour ascend will act as a cause of rain. In a perfectly still atmosphere over a sheet of warm water, aqueous vapour will constantly be formed, and by spontaneous diffusion will ascend until the air becomes saturated with vapour, and cloud or rain is generated. The saturation point is always reached first at some high level, whilst the air at the surface of the ground is still capable of taking up more moisture.* The reason of this is that the temperature falls too rapidly on ascending to permit the vapour to attain the condition of equilibrium that would finally be reached by diffusion; because the quantity of moisture required to satisfy the conditions of equilibrium at a high level is much greater than that which can exist as vapour at the temperature of the given elevation. Cumulus clouds formed in this way are frequently seen at the close of the rainy season, and about that time of the year a fine day often ends in a thunderstorm or other atmospheric disturbance, due to the recondensation of the water vapour raised by the action of the sun while above the horizon.

The latent heat given out during the precipitation of rain expands and diminishes the density of the air with which the vapour was mixed, and thus sets the whole mass ascending. This is followed by a further

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condensation of vapour, the liberation of more latent heat, an acceleration of the ascensional movement, and a strengthening of the indraught of air at the bottom. In this way rain-fall once commenced tends to perpetuate itself, provided the supply of vapour be kept up. The summer monsoon current is thus maintained for a short time after the thermal focus of the Indian continent has travelled to the south of the region toward which the winds blow, and the force and persistency of this atmospheric current are much greater than the mere difference of temperature between sea and land observed at the surface of the earth would lead us to expect. In the same way the torrential rains and violent winds of a cyclonic storm are supposed to be produced by the rapid condensation of vapour. A fuller account of the functions performed by rain-fall in atmospheric physics will be found in Mr. John Eliot's cyclone reports, and in his report on the meteorology of India in 1877.

The increase of rain-fall to the south of the Jumna can now be explained. It is due partly to the action of the Bundelkhand hills and those of Rajputana in causing the air to ascend, but perhaps chiefly, as Mr. Eliot has suggested, to the atmospheric eddies or minor cyclones produced by the interaction of the easterly and westerly winds from the Bay of Bengal and the Arabian Sea, which meet along this line. This is shown by the unsteadiness of the winds in the neighbourhood of the Jumna during the monsoon months, south-easterly and north-westerly winds being nearly equally frequent.

Thus, at the following stations along the Ganges-Jumna, the per-centages of the winds that blow from the mean directions are very small :—

Stations.	Mean directions—June, July, August, and September.	Steadiness per cent.	Years' Observations.
Benares -	S. 16° E.	5	10
Chunar -	S. 27° E.	7	2
Allahabad -	N. 22° W.	7	8
Agra -	N. 40° W.	10	7

Contrasted with these we have, for the region of easterly winds north of the Ganges, the following figures which indicate much greater steadiness :—

Stations.	Mean directions—June, July, August, and September.	Steadiness per cent.	Years' Observations.
Gorakhpur -	S. 77° E.	46	8
Fyzabad -	E.	58	7
Lucknow -	S. 42° E.	14	6
Bareilly -	S. 74° E.	21	7
Fatehgarh -	S. 18° E.	17	4
Meerut -	N. 26° E.	26	5
Roorkee -	S. 30° E.	19	7

To the south of the Jumna also, in the region swept by south-westerly winds from the Bombay coast, the per-centage indicating the steadiness of the wind is far greater than along the line of that river, as shown in the following table :—

Stations.	Mean directions—June to September.	Steadiness per cent.	Years' Observations.
Jhansi -	N. 88° W.	21	10
Saugor -	S. 71° W.	61	8
Jabalpur -	S. 85° W.	47	8
Sutna -	N. 64° W.	45	3

The zone in which the opposing winds meet is constantly shifting, but there can be little doubt that the principal eddy thus formed most frequently occupies the quadrilateral bounded by lines joining Allahabad, Benares, Sultanpur, and Rae Bareli, and that the excessive rain-fall over the north-eastern half of this region, as compared with the districts to the eastward at the same distance from the Himalaya, is due to the indraught and ascension of moist air in the feeble cyclonic vortex thus formed.

The cyclonic character of the winds of this region throughout the summer monsoon is clearly shown by the resultant directions E. at Fyzabad, N. N. E. at Rae Bareli, N. E. at Partabgarh, N. N. W. at Allahabad, S. by E. at Benares, and E. by S. at Gorakhpur. The relations of wind to rain-fall have only been worked out in detail for one station, Benares.

The direction from which rainy winds most frequently blow at Benares is due east. Next in order of frequency come north-east, due west, south-east, south-west, and north-west, rain least frequently accompanying winds from the north and south. Winds from these latter directions blow very seldom, whilst easterly and especially westerly winds are often felt. Consequently we find that rain accompanies a south-easterly wind one day in three, an easterly wind two days in seven, a north-east wind one day in four, a south-west wind one day in five, a south wind one day in six, a north or north-west wind one day in seven, and a westerly wind only one day in 13. The average rain-fall of the 10 years, 1867–76, was distributed under the principal wind directions as follows :—

	Inch.
North - - - -	1·21
North-east - - -	5·99
East - - - -	9·37
South-east - - -	4·84
South - - - -	0·46
South-west - - -	4·57
West - - - -	8·47
North-west - - -	4·49
Calm - - - -	2·51

From this it appears that the ratio of the rain brought by westerly winds to that which comes from the east is much greater than would be expected from the relative frequency of rainy winds from these quarters. In fact the individual falls of rain are more than half as heavy again when the wind is westerly as when it is easterly. The average daily rain-fall when the rainy wind blows from each of the eight principal points of the compass is the following :—

	Inch.
North - - - -	0·684
North-east - - -	0·557
East - - - -	0·590
South-east - - -	0·560
South - - - -	0·655
South-west - - -	0·684
West - - - -	0·880
North-west - - -	0·885

The excessive precipitation with westerly and north-westerly winds is doubtless due to the circumstance that, in the rainy season, such winds only reach Benares when there is a cyclonic circulation of the air round a region of low barometer and heavy rain-fall in the valley of the Gumti river to the north.

The relations of wind to rain-fall at Benares being thus affected by the proximity of the station to the region of heavy rain in Jaunpur and south-eastern Oudh, it would be very desirable to know what these relations are at places further to the west,—for example, at Lucknow, Agra, or Roorkee. Sufficient materials already exist for the discussion of the question as regards some of these places, but I have not yet been able to work them up.

Average Rain-fall of the Province.—People often ask what is the average rain-fall of the North-Western Provinces, or what was the rain-fall of last year. Such a question is not very easily answered offhand. Sometimes the answer given is the simple mean of the rain-fall totals for all the observing stations, sometimes the mean of the averages for the several districts, and often the mean of the divisional averages; these in turn being the averages of the averages for

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all the districts in each division. Examples of all these ways of calculating the average rain-fall of the province might be quoted from official reports.

The first method will obviously give too low a result, because rain-gauge stations are numerous in the dry districts of the Meerut and Agra divisions, and few and far between in the rainy districts of the Benares division and the north of Oudh. The second might be expected to give a better result, but still there would be a large probable error owing to the very unequal areas of the districts. By the third method the doubt would be increased, because the divisions are by no means equal in area, and the number of these units is much smaller than that of the districts. In fact, to obtain a correct average for the whole province, the total area should be divided into a number of portions so small that the rain-fall of each would be the same in every part. The area of each small portion should then be multiplied by its rain-fall, and the sum of the products divided by the total area. To perform this operation would of course be practically impossible, but a close approximation to the same result may be obtained by adding together the averages for all the equal sections given in the table on page 5 (counting only such rectangular sections or portions of these as are contained within the provincial boundary), and dividing the sum by the number of sections. The average for the plains districts, including the native territory of Rampur, and such Native states in Bundelkhand as are more or less completely surrounded by British territory, thus determined, is 37·6 inches. Another accurate method, the details of which are given in the next table, consists in taking off from the map by means of a planimeter the area of so much of each strip of country bounded by lines of equal rain-fall as lies within the province, multiplying the area of each strip by the arithmetical mean of the figures attached to the two boundary lines, and dividing the sum of the products by the sum of the areas.

MEAN RAIN-FALL of the PROVINCE as measured from the RAIN-FALL MAP.

Strip.	Area—square miles.	MeanRain-fall—inches.	Product.
Under 25 inches - - - - - - -	4,333	22·5	97,492·5
From 25 „ to 30 inches - - - -	12,113	27·5	333,107·5
„ 30 „ to 35 „ - - - -	20,648	32·5	671,060·0
„ 35 „ to 40 „ - - - -	21,761	37·5	816,037·5
„ 40 „ to 45 „ - - - -	19,949	42·5	847,832·5
„ 45 „ to 50 „ - - - -	10,379	47·5	493,002·5
Over 50 „ - - - - - -	4,672	57·5 (?)	268,640·0
Total - - - - -	93,855	37·58	3,527,172·5

The average annual rain-fall of the whole province, with the exception of the Himalayan districts, determined in this way is 37·58 inches—a result that agrees very closely with the other. For the hill districts the data are much too few to afford any legitimate ground for constructing an average. Leaving these out of account, we find that the 233 plains stations within the bounds of the province give a simple average of only 35·2 inches, and this is, as we have anticipated, a good deal less than the true average.

The district and divisional averages, calculated in the usual way, are the following :—

	Inches.		Inches.
Saharanpur -	- 41·60		
Muzaffarnagar	- 29·96		
Meerut -	- 25·61		
Bulandshahr -	- 25·64		
Aligarh -	- 24·68	Meerut division (excluding Dehra Dun) -	- 29·50
Bijnor - -	- 42·11		
Moradabad -	- 39·13		
Tarai - -	- 47·78		
Bareilly -	- 44·75		
Budaun -	- 31·94		
Sháhjahánpur	- 36·06	Rohilkhand division (with the Tarai) -	- 40·30
Muttra -	- 24·36		
Agra - -	- 25·42		
Mainpuri -	- 31·55		
Etawah -	- 32·25		
Etah -	- 29·37		
Farukhabad -	- 30·10	Agra division -	- 28·84
Jalaun -	- 30·18		
Jhansi - -	- 34·47		
Lalitpur -	- 38·61	Jhánsi division -	- 34·42
Cawnpore -	- 31·17		
Fatehpur -	- 34·02		
Hamirpur -	- 32·89		
Banda -	- 39·12		
Allahabad -	- 36·47		
Jaunpur -	- 40·37	Allahabad division	35·68
Mirzapur -	- 41·05		
Benares -	- 38·58		
Ghazipur -	- 37·66		
Azamgarh -	- 37·14		
Basti - -	- 45·83		
Gorakhpur -	- 44·02	Benares division -	- 40·71
Kheri - -	- 46·10		
Sitapur -	- 35·43		
Hardoi -	- 31·64	Sitapur division -	- 37·72
Bara Banki -	- 37·71		
Lucknow -	- 34·36		
Unao -	- 31·93	Lucknow division -	- 34·67
Bahraich -	- 45·11		
Gonda -	- 42·70		
Fyzabad -	- 38·28	Fyzabad division -	- 42·03
Rae Bareli -	- 33·20		
Sultanpur -	- 39·88		
Partabgarh -	- 34·22	Rae Bareli division	- 35·77
Mean of districts	- 35·78	Mean of divisions -	- 35·96

It happens that the divisions and districts of large and small areas are nearly equally divided between the dry and wet portions of the province. The averages calculated on the bases of the districts and the divisions respectively therefore agree very closely when many years' observations are taken into account, and either result differs from the true average by less than two inches. It does not follow, however, that the mean of the district averages for any single year will approach as closely to the truth, for it may happen that the majority of the small districts will be drier than usual, and most of the large districts wetter, or *vice versâ*.

The chief reason why the district averages give a result considerably below that obtained from the sections of equal area is the fewness or the entire absence of gauges in the rainiest parts of the Mirzapur, Gorakhpur, and Basti districts, and along the north of Oudh. The Rampur territory and portions of Chirkhari and other native states in Bundelkhand have also been included in the equal sections, but the rain-fall of these differs little from the average for the whole province.

SECTION II.—DISTRIBUTION IN TIME.

Rain-fall, like every other atmospheric phenomenon, is subject to two periodic variations, depending on the varying influence of the sun's heat, according to the different ways in which the portion of the earth's surface under consideration is presented to the sun by the diurnal rotation and the annual revolution of the earth in its orbit.

It may also be subject to a variation of long period, dependent upon a supposed inequality in the absolute

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quantity of heat emitted from the sun at different times. Taking these three periods in order, the diurnal variation will be first considered.

Diurnal Variation.—The data available for the determination of the distribution of the rain-fall of the North-Western Provinces from hour to hour are too few to admit of any very accurate conclusions being drawn from them. During the three years 1876, 1877, and 1878, hourly meteorological observations were taken on the 7th, 14th, 21st, and 28th of each month at four stations—Roorkee, Agra, Lucknow, and Allahabad. The observations extended from midnight to midnight each day. During the three years there were thus 144 observations taken at each station for each hour except midnight. At this hour 288 observations were taken.

There were thus 14,400 observations altogether, and out of these rain was observed to be falling 473 times. Dividing the numbers for midnight by two, to make them comparable with the rest, we find that rain was observed 455 times out of a total of 13,824 observations, or once, in thirty times nearly. The distribution of the rain-fall observations among the different hours is shown in the following table:—

HOURLY FREQUENCY of RAIN-FALL.

Stations.	Hours.											
	Mid-night.	1 A.M.	2 A.M.	3 A.M.	4 A.M.	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.
Roorkee -	7	12	12	12	15	11	12	11	9	9	9	7
Agra -	2	3	3	4	6	5	6	4	5	1	3	4
Lucknow -	3	5	4	4	3	2	3	6	5	4	4	3
Allahabad -	6	8	5	6	5	6	4	5	1	3	5	4
Total -	18	28	24	26	29	24	25	26	20	17	21	18

Stations.	Hours.											
	Noon.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	9 P.M.	10 P.M.	11 P.M.
Roorkee -	9	5	3	4	5	6	3	5	4	2	2	5
Agra -	5	8	5	7	6	3	2	2	4	2	2	3
Lucknow -	3	3	2	4	5	4	1	1	3	4	2	1
Allahabad -	7	3	5	3	4	2	4	3	5	2	2	4
Total -	24	19	15	18	20	15	10	11	16	10	8	13

The hour at which rain is most frequent appears to be 4 a.m. This is very nearly the time of greatest humidity of the air near the ground. The hour of least frequent rain-fall, however, occurs at 10 p.m., long after the driest time of the day, the latter falling in the afternoon shortly after the time of highest temperature. The hour of least frequent rain-fall nearly coincides, however, with that of least humidity at the height of the cloud stratum. In the next table the distribution of cloud from hour to hour is given, and it will be seen that there is a general similarity between the cloud and rain-fall tables, though the rain-fall is more frequent in the early morning hours than the distribution of cloud would lead us to infer.

HOURLY DISTRIBUTION of CLOUD in TENTHS of the VISIBLE EXPANSE of SKY.

Stations.*	Hours.											
	Mid-night.	1 A.M.	2 A.M.	3 A.M.	4 A.M.	5 A.M.	6 A.M.	7 A.M.	8 A.M.	9 A.M.	10 A.M.	11 A.M.
Roorkee -	3·14	3·20	3·22	3·08	3·09	3·03	3·20	3·30	3·25	3·30	3·44	3·48
Lucknow -	2·47	2·63	2·68	2·69	2·80	3·26	3·32	3·46	3·50	3·38	3·50	3·58
Allahabad -	2·56	2·54	2·59	2·55	2·60	2·93	3·35	3·46	3·29	3·36	3·20	3·32
Mean -	2·72	2·79	2·83	2·77	2·83	3·07	3·29	3·41	3·35	3·35	3·38	3·46

Stations.	Hours.											
	Noon.	1 P.M.	2 P.M.	3 P.M.	4 P.M.	5 P.M.	6 P.M.	7 P.M.	8 P.M.	9 P.M.	10 P.M.	11 P.M.
Roorkee -	3·65	3·49	3·77	3·74	3·61	3·41	3·33	3·18	3·05	3·07	3·19	3·12
Lucknow -	3·73	4·09	4·13	3·99	3·94	3·88	3·70	2·94	2·52	2·52	2·45	2·31
Allahabad -	3·45	3·52	3·67	3·79	3·74	3·72	3·69	2·99	2·62	2·47	2·66	2·63
Mean -	3·61	3·70	3·86	3·84	3·76	3·67	3·57	3·04	2·73	2·69	2·77	2·69

* Agra is not included in this table because the observer there only estimated the amount of cloud visible in the daytime.

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At only two of the stations, Agra and Lucknow, was the rain-fall measured from hour to hour. The number of observations was much too small to yield a mean for each hour free from considerable irregularities, but by lumping together the observations of several hours the results are rendered more uniform. Thus 32 per cent. of the total rain was collected between midnight and 6 a.m.; 35 per cent. between 6 a.m. and noon; 28 per cent. between noon and 6 p.m.; and only 5 per cent. between 6 p.m. and midnight.

The practical conclusion to be drawn from these results is that where a rain-gauge is read only once a day, the hour that will be most convenient to the observer, and at the same time will give the day's rain-fall with the least error, is 6 p.m. This has for some years been the hour prescribed for reading the rain-gauge at the meteorological observatories, and I believe it has been generally adopted for the district gauges since the beginning of the present year (1879). Previously there was no general rule as to the hour at which the rain was to be measured, those in use ranging from 6 a.m. to 7 p.m.

Annual Variation.—A reference to the figures for the mean rain-fall of each month will show that the month of least rain nearly everywhere is November. At the majority of the stations this month has been without rain ever since 1864 or (in Oudh) 1868. December is also a month of very scanty rain, but towards the end of the year the showers, usually known as the "Christmas rains," begin to fall. The winter rains continue to fall at intervals throughout January, February, and March, attaining their maximum in January at most of the stations in these provinces, in February at a few of the north-western stations on the plains and in Kumaun, and in March along the north-western frontier and in the Himalaya north of the Punjab. A second minimum of rain-fall is reached in April, this month being nearly as rainless as November at most places on the plains. The rain-fall of the latter half of March and the whole of April and May falls chiefly in thunderstorms, or at the end of the duststorms that are frequent in these months. In March and April the precipitation accompanying thunderstorms often takes the form of hail.

The first half of June is usually a dry period, broken only by occasional thunderstorms, but between the middle and the end of the month the heavy rains of the summer monsoon commence. These are heaviest in July, usually about the end of the month. They gradually decrease in frequency and amount during August and September, and finally cease near the end of that month, or in the first week of October.

At the time of heaviest rain in July it frequently rains more or less every day for ten days or a fortnight, but in August and September the "breaks in the rains" become more numerous and last longer until the end of the rainy season is reached.

The two minima in November and April serve to divide the rain-fall of the year into two distinct seasonal falls. The winter rains extend from November to April inclusive, and have their maximum in January or February. The summer rain falls during the remaining months and attains its maximum in July. For the purposes of agriculture, it is necessary, however, to distinguish between the winter rains proper, which fall in the four months November, December, January, and February, and the showers that fall during the thunderstorms of March and April. The former are usually beneficial to the crops, whilst the latter are injurious. In drawing the maps representing the distribution of the rainfall of the different seasons, the "winter rain" has been taken to include only that which falls from November to February; the rain of March and April, together with that of May, has been called "hot-weather rain," and that of the five months, June to October, has been called the "monsoon rain."

The relative humidity of the air near the ground has also two maxima and two minima each year, corresponding to the maxima and minima of rain.

MEAN MONTHLY HUMIDITIES in PER-CENTAGES of SATURATION.

Stations.	Years' Observations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Chakrata - - -	8—9	64	63	55	45	50	67	91	92	84	61	50	58
Ranikhet - - -	7	56	54	47	38	48	61	82	83	76	55	50	51
Dehra - - -	10	58	56	48	38	38	56	79	81	75	56	50	56
Roorkee - - -	10	66	63	51	36	36	51	76	76	73	61	57	65
Meerut - - -	9	56	49	44	33	39	47	70	71	66	52	48	56
Bareilly - - -	9—10	61	55	46	36	37	53	75	75	72	58	51	58
Agra - - - -	9—10	55	47	40	28	29	47	68	72	69	48	42	52
Lucknow - - -	10	58	49	37	30	36	54	74	76	73	56	46	54
Gorakhpur - - -	9—10	59	52	46	41	51	67	78	81	77	61	51	59
Jhánsi - - - -	10	47	39	33	24	27	46	70	70	67	43	35	43
Allahabad - - -	6—9	60	51	40	35	37	51	75	76	76	60	53	59
Benares - - -	8—9	65	57	45	39	41	60	81	82	80	67	63	66

This distribution of atmospheric humidity is clearly the effect rather than the cause of the rain distribution, because it is least in April before the rainy season proper, and there is only a secondary minimum in November, whereas the rain-fall is everywhere less in November than in April. The excess of humidity in November as compared with April is doubtless caused partly by the greater evaporation from the ground in the former month, and partly by the very high temperature of April, which renders the air capable of retaining in the gaseous form a much larger proportion of moisture than it actually possesses.

The distribution of cloud observed at the meteorological stations of the North-Western Provinces accords perfectly with that of rain-fall, as might, indeed, have been expected.

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MEAN MONTHLY DISTRIBUTION of CLOUD in TENTHS of the whole EXPANSE.

Stations.	Years' Observations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Chakrata	6—7	4·51	4·18	4·03	2·92	3·48	4·20	8·42	8·47	6·79	2·28	1·74	3·62
Ranikhet	6—7	3·93	4·24	3·89	3·07	3·40	5·61	8·56	8·43	5·64	1·69	1·31	2·99
Dehra	6—7	4·08	3·55	3·58	2·77	3·06	4·36	7·62	7·29	4·83	1·08	1·33	2·74
Roorkee	6—7	3·16	3·17	2·54	2·10	1·91	3·08	6·36	6·03	4·58	0·99	0·82	2·18
Meerut	5—7	2·93	2·20	2·54	1·91	2·03	3·14	7·03	6·15	4·98	0·87	0·65	1·82
Bareilly	6—7	3·17	2·62	2·54	1·48	1·76	3·78	6·88	6·93	4·50	0·73	0·72	1·85
Agra	6—7	1·73	2·05	1·54	1·19	1·09	3·32	5·68	5·68	3·86	0·62	0·55	1·23
Lucknow	6—7	3·46	3·27	3·12	2·39	2·11	4·86	7·67	7·06	5·62	1·61	0·92	2·37
Gorakhpur	5—7	2·18	1·93	1·47	1·17	1·75	4·10	5·74	5·75	4·74	1·61	0·64	1·12
Jhánsi	3—7	0·83	0·68	0·21	0·66	0·79	1·88	5·00	4·43	2·40	0·19	0·34	0·40
Allahabad	7	2·18	2·17	1·77	1·24	1·68	4·18	8·03	7·38	5·46	1·19	0·67	2·09
Benares	6—7	2·54	2·11	2·28	2·00	2·23	4·77	7·57	7·55	5·48	2·17	0·94	1·94

The figures for the different stations in this table are not fairly comparable, since in cloud estimations a good deal seems to depend on the idiosyncracy of the observer. Thus the figures for Gorakhpur are much too low in comparison with the others, and those for Allahabad perhaps a little too high.

The map showing the distribution of the winter rain over the provinces indicates the excess of rain at this season towards the north-west. Thus the lines of 4, 3, and 2 inches winter rain-fall, which cross the plains of the Punjab at a considerable distance from the hills, approach nearer and nearer to the Himalaya as they pass eastwards through the Doab, Rohilkhand, and Oudh, until in the north of Behar they all enter or touch the mountain zone. The districts with least rain in winter are Agra, Jalaun, and Jhánsi, with the adjoining portions of the Gwalior territory. In this respect the south-western part of these provinces resembles Malwa and the greater part of the Bombay Presidency.

The rain of March, April, and May is greater at all the Himalayan stations than that of the winter months November, December, January, and February, whereas on the plains it is a good deal less. On the plains the rain of these three months, which falls chiefly in May, varies from over three inches in north Behar to less than an inch in Bundelkhand. The region of least rain-fall in these months includes the whole of Bundelkhand, the Allahabad division, and two or three of the southern districts of Oudh. The May showers, which in Behar may be considered a regularly recurring periodical phenomenon, are only felt as such in the north-eastern districts of these provinces and in parts of Mirzapur. Elsewhere the rain-fall of May is confined to local showers accompanying thunderstorms.

The monsoon rains, which constitute nine-tenths of the average annual fall, are very similar in distribution to the total rain-fall of the year.

Regularity of the Seasons in India.—Nothing can better illustrate the great regularity of all the elements of meteorological observations in India than the small variability of the dates of the beginning and end of the rainy season. Thus, at Bombay, in three years out of four, the monsoon rains commence on the 4th or 5th of June, and when they are a week later than usual, as they were in 1878, all sorts of dire effects are expected to follow. The farther any place is from the coast the less likely are the moist winds to reach it every year about the same time, but even in the North-Western Provinces the uniform sequence of the seasons is very striking.

Thus the winter rains commence on the average about the 22nd of December in the north-western districts, and a day or two later in the south-eastern; hence their usual name "the Christmas rains." The greatest observed variations from this date during 16 years were 20 days before and 17 days after the mean. The odds are exactly even that in any given year these rains will commence between the 20th December and the end of the month.

The dates of the beginning and end of the summer monsoon are given in the next table. In Kumaun and Gorakhpur the rains begin earliest, and in three days they extend over the whole province. But although there is a great deal of uniformity in the average dates, nothing like a regular march of the monsoon from one end of the province to the other, can be observed in any single year. The summer rains cease first in the Punjab and the north-western districts of these provinces, and continue longest in the most easterly district, Gházipur.

DATES of the COMMENCEMENT and CLOSE of the MONSOON RAINS, from the OBSERVATIONS of 15 Years.

Districts.	COMMENCEMENT.			CLOSE.		
	Mean.	Earliest.	Latest.	Mean.	Earliest.	Latest.
Gorakhpur	14th June	30th May	1st July	1st October	20th September	19th October.
Gházipur	16th „	1st June	2nd „	3rd „	20th „	19th „
Benares	17th „	6th „	3rd „	30th September	15th „	18th „
Allahabad	16th „	4th „	1st „	30th „	15th „	16th „
Cawnpore	17th „	4th „	3rd „	28th „	17th „	17th „
Bareilly	16th „	1st „	9th „	29th „	17th „	18th „
Jhánsi	16th „	4th „	28th June	28th „	16th „	16th „
Agra	17th „	3rd „	10th July	26th „	11th „	17th „
Saháranpur	17th „	3rd „	8th „	27th „	11th „	18th „
Kumaun	14th „	1st „	29th June	1st October	18th „	17th „
Dehra Dún	16th „	2nd „	1st July	30th September	13th „	18th „

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The extreme variation of the date of commencement on the average of the 11 districts given in the table is exactly a month, and the variation of the date of the cessation of the rain is just the same. The table shows that the usual rule regarding the duration of the monsoon rains, viz., that they commence in the middle of June, and last to the end of September, is very close to the truth.

Causes of the observed Distribution in Time.—At the end of October and throughout November the atmosphere over Northern India is more nearly in a state of statical equilibrium than at any other time of the year. Very light winds or calms prevail over the whole area in November. The fluctuations of pressure are confined to the daily barometric tides, and a succession of slow pulsations of very small amplitude with a period of ten days or a fortnight. Similar conditions obtain in December, but in that month the wind velocity becomes greater, and the amplitude of the barometric oscillations also increases. Towards the end of the month "the barometer falls "for several days, easterly winds set in over the "Gangetic valley, thus reversing the normal direc"tion of the lower atmospheric current; clouds form, "and rain begins to fall, generally commencing in "the Punjab, and extending eastward over the North"Western Provinces, and occasionally over Behar, "Bengal, and even Assam. The explanation appears "simple. It has been pointed out that the impor"tant air movements at this time are not horizontal, "but vertical. The fall of the barometer preceding "the setting in of the easterly winds and the rain"fall appears to indicate an ascensional movement of "the atmosphere going on over a part or the whole "of Northern India. The ascensional movement is, "in the majority of cases, the indispensable condition "for the formation of cloud and for rain precipitation. "This is followed by indraught, which takes mainly "the form of an easterly current up the Gangetic "valley. Hence, according to this view, the easterly "winds are a frequent accompaniment, and therefore "an occasional indication, but they are not the cause "of the cold weather rains, neither do they bring "them. These rains are almost entirely due to the "moisture brought up by the upper south-west cur"rent, the reverse of the north-east trade wind, "which is the characteristic wind of the lower strata "of the cold season in Southern Asia and the adjacent "seas."*

It was formerly supposed that the winter rains were simply the effect of the low temperature of the winter months, whereby a portion of the aqueous vapour always present in the air was condensed. This view is, however, inconsistent with the fact that in the North-West Punjab, where these rains are heaviest, the month in which the precipitation is greatest is March, whereas the coldest month is January. In a year when these rains are heavy in January, as in 1877, there is also a well-marked increase in the pressure of atmospheric vapour in January as compared with the months before and after, although the low temperature of the month would by itself tend to diminish the pressure of vapour. This may be illustrated by the following table, which gives the vapour tension for three winter months of 1876-77 at 20 places in North India. The increase in January 1877 was very well seen as far down as Lower Bengal, but on the eastern side of the Bay it was not perceptible.

INCREASE of VAPOUR TENSION in NORTH INDIA in January 1877.

Stations.	Vapour Tension.		
	December 1876.	January 1877.	February 1877.
	Inch.	Inch.	Inch.
Simla - - -	·160	·173	·171
Chakráta - - -	·154	·164	·147
Dehra - - -	·305	·317	·301
Ranikhet - - -	·195	·201	·182
Peshawar - -	·256	·260	·227
Rawal Pindi - -	·256	·277	·255
Sialkot - - -	·326	·362	·330
Lahore - - -	·258	·315	·295
Delhi - - -	·233	·320	·277
Roorkee - - -	·311	·339	·330
Meerut - - -	·270	·338	·300
Bareilly - - -	·285	·351	·334
Agra - - -	·265	·329	·263
Lucknow - - -	·280	·368	·295
Gorakhpur - -	·329	·383	·336
Jhánsi - - -	·245	·309	·257
Allahabad - -	·343	·427	·349
Benares - - -	·309	·388	·321
Hazaribagh - -	·256	·344	·270
Chittagong - - -	·457	·459	·482

The excess in January 1877 was no doubt partly perhaps chiefly, an effect of the evaporation of the heavy rain of that month; but it was not altogether due to this, because the original observations, from which the means in the table have been calculated, show a distinct increase in the proportion of vapour accompanying the easterly wind which set in two days before the rain commenced in the North-Western Provinces.

Since these rains, accompanied or preceded by moist south-easterly wind, begin first in the Punjab, whilst in the eastern districts of the North-Western Provinces and in Behar dry winds from the opposite quarter are blowing, it would be difficult to account for their formation were it not known that an upper current from the south or south-west nearly always blows in opposition to the trade wind of the north hemisphere, and that in subtropical regions this descends and becomes a surface wind. As a current of air is cooled on ascending, it is heated by descending and being compressed. Consequently the moist current from the equator does not usually precipitate its vapour in the region of its descent unless there is some independent cause of cold at work. Accordingly we find that in the subtropical zones of both hemispheres, outside the region of the monsoons, as, for example, in Afghanistan, Persia, Asia Minor, the Mediterranean coast region, California, the Cape of Good Hope, and South Australia, rain is almost entirely confined to the winter months. There can be little doubt that the winter rain of North India is only a part of the same general phenomenon.

If this be the case, the easterly or south-easterly winds of the Gangetic valley, that precede or accompany the winter rains, would be explained, as, in part at least, due to the descent of a branch of the equatorial current in a region lying to the south of the Ganges; its subsequent northward movement being modified by the direction of the mountain range. The upward deflection of this current where it strikes against the mountains of the north-west Punjab would suffice to start the precipitation; and, as has been already shown, the rain-fall when once commenced will tend to perpetuate itself. The influence of the equatorial current thus continues to be felt in the extreme north-west, where the rains are heaviest down to the end of March or April. Over India proper the north-west winds of the hot season are by that time blowing in full strength; and the upper current only shows itself now and then in the form of streaks of cloud drifting from the south-west, or in the rain or hail that falls during a thunderstorm. In the hot season the region of the descent of the upper current has probably travelled far to the north or north-west of the Indian area.

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* This account of the origin of the winter rains, the most rational I have yet seen, I have taken the liberty of reproducing from Mr. Eliot's report on the meteorology of India for 1877. It seems probable, however, that the easterly winds in the valley of the Ganges which accompany these rains may not be altogether the effect of the rains, but partly also their cause, and may be connected with a considerable change in the direction of the upper current, indicated by the wind-directions at Chakráta during the winter months, viz., in November, S.W. by S.; in December, S.S.W.; in January, S.E. by S.; in February, S.E. by E.; in March, S.S.E.; and in April, S.W. by W.

As the temperature rises in March and April hot north-westerly winds blow down the valley of the Ganges with increasing velocity. These are, however, only day winds, blowing most strongly in the early hours of the afternoon and dying away about sunset. During the months characterised by these hot winds the barometer falls steadily over India, and the decrease of pressure is greatest in the Punjab and Rajputana whence the winds blow. At last the usual relation between pressure and wind direction becomes reversed, and the winds for some time blow apparently from places where the pressure is low to places where it is higher.

In the cold weather months the barometer stands highest in the Punjab, and the pressure decreases uniformly southwards to the neighbourhood of the equator. During the hot weather the pressure falls more rapidly in the interior of Northern India than over the Bay of Bengal and the Arabian Sea; thus in April there is a ridge of high pressure stretching across the Southern India and the Bay, from which the north-east monsoon continues to blow on one side, and southerly sea winds, which bring frequent showers to the coasts of Bengal and Orissa, on the other.

As the season advances these sea winds increase in strength, and the ridge of high pressure moves southward, but the winds are still confined to the lower strata of the atmosphere only. At last, about the middle of May, the high pressure of the centre of the bay retreats to the equator and disappears; there is then a nearly uniform slope of pressure or "baric gradient" extending from the tropic of Capricorn to the Himalaya. This sets in motion towards Southern Asia a broad and very deep current of the atmosphere, which, blowing over an immense area of warm sea, arrives saturated with moisture.* Along the west coast of India it appears as a westerly or south-westerly wind (owing to the deflection caused by the earth's rotation), at the head of the Bay of Bengal its direction is nearly due south, and in the valley of the Ganges it is south-easterly or easterly, while in the north of the Punjab it is often north-easterly. The movement of the wind of the summer monsoon is therefore cyclonic or rotatory round the region of greatest heat at the end of June or beginning of July; but the westerly winds which blow across Southern India, in what may be called the normal course of the monsoon, are much more powerful than those which blow up the valley of the Ganges from the east. These easterly winds, though all important to the North-Western Provinces, Behar, and the eastern half of the Punjab, are in fact only a minor eddy in the great south-westerly current that sets in towards Southern Asia in the summer months; and being only a minor feature of the general movement, they are very liable to be disturbed by small and apparently quite insignificant variations in the distribution of barometric pressure.

The monsoon rains commence in the extreme south of India, Ceylon, and Burmah in the last week of May. They advance rapidly along the coast, and reach Bombay in the first and Calcutta in the second week of June. Though the advance is pretty uniform along the coast, it is by no means so in the interior of Upper India. The temperature of this region being much higher than that of the Bay of Bengal, the sea wind advancing inland will for that very reason become drier, and may continue to blow for days or even weeks before an atmospheric disturbance sufficient to cause general rain-fall is set up. In this way the approach of the rains is heralded by a sudden and great increase of the proportion of aqueous vapour in the air, sometimes a week or more before the rain begins, and even before the direction of the wind at the surface of the ground gives any indication of its approach.

At last some cause, perhaps slight and apparently accidental, sets a portion of the air in upward motion and rain commences. It has already been shown how the fall once commenced tends to perpetuate and feed itself by setting free latent heat and expanding the air, thus producing a further upward movement and the indraught of more moist air.

In this way rain continues to fall at frequent intervals over Upper India until the time of the autumnal equinox, when the rapid retreat of the sun to the south of the equator produces a general lowering of the temperature and a weakening of the monsoon current, which gradually dies away about the end of September. By the middle of October the rains have usually ceased, and the season of clear skies, uniform pressure, and feeble north-westerly winds has come round again.

Monthly Frequency of Hailstorms.—In connexion with the monthly distribution of rain-fall it may be well to state what is known of the relative frequency of hailstorms at different seasons of the year. A knowledge of the distribution of these storms both in time and in space is of such immense importance to agriculture in this country that it might be thought the occurrence of each storm would be carefully noted in the weekly rain returns furnished by the district officers. As a matter of fact this has very seldom been done, however, the column of the rain-fall forms headed "Remarks" having been for many years usually occupied by the information that the wind during the week was "easterly and westerly" and the weather "cloudy and clear." Of late the latter remark has fallen into the disuse it merited. During the years 1873–77, Dr. Bonavia of Lucknow received information of nearly every hailstorm observed in the province of Oudh, and published the same in a tabular form in the annual reports of the Lucknow Observatory. From his tables, combined with the few notices of hailstorms in the reports of the Board of Revenue, and with occasional notices of such storms during 1878 furnished by the district officers, the following figures are taken. They give nearly all the available information on the subject:—

Month.	Number of Storms.
January	10
February	11
March	18
April	9
May	4
June	0
July	0
August	0
September	0
October	3
November	0
December	0

The month of greatest frequency is March, and the four months of the rainy season June, July, August, and September, as well as the dry months, November and December, appear to be free from hail. In May and October these storms are very unusual, the only ones recorded having occurred in October 1877, and May 1855 and 1878; these months being all characterised by very extraordinary atmospheric conditions in Northern India. The figures, so far as they go, agree fairly with a table of the relative frequency of hailstorms at different seasons, published by Dr. Buist in the British Association Report for 1855. Dr. Buist's table includes observations from all the provinces of India. It shows that hail is most frequent in February, March, and April, and very rare in the remaining months, especially during the rainy season.

The hailstones which fall in May in these provinces seem to be distinguishable by their immense size. On the 11th of May 1855 a hailstorm occurred at Naini Tál in which many stones of 6, 8, or 10 ounces in weight, and even one or two weighing more than a pound and a half, were observed to fall, the circumferences of these varying from 9 to 13 inches.

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* This account of the transition from the N.E. to the S.W. monsoon is substantially the same as that given in the Meteorological Report for 1877 by Mr. Eliot.

In May 1878, there were severe hailstorms in many districts on the 6th and 8th. On the former day hailstones weighing a pound and a half each fell at Muhammadabad and Rasra, in the Ghazipur district, and others from two to two and a half inches in diameter fell at Azamgarh. About the same time there was a storm at Naini Tál in which some of the hailstones were sufficiently heavy to punch holes through the zinc roofs on which they fell; and the quantity of hail which fell was so great that it lay in shady places nearly a month. In the cooler months of February, March, and April such large hailstones have not been observed.

All the districts of the North-Western Provinces and Oudh are subject to occasional visitations of hailstorms. Those parts of the provinces from which they are most frequently reported comprise the Himalayan districts, Rohilkhand, Oudh, the middle Doáb, Hamírpur, and Jhánsi.

Variations of long period.—Of late years the questions whether the sun's heat is variable or not, and whether any variation that may exist can be detected in remote meteorological effects, such as rain-fall, have excited a considerable degree of interest, and given rise to long discussions in *Nature* and other scientific journals. Nothing like a definite conclusion regarding these questions has yet been arrived at; many observers holding that there is a balance of evidence in favour of an excess of solar heat and terrestrial rain-fall when sun-spots are numerous, and others that the heat is greatest when the sun-spots are few. The question as regards its bearing on the rain-fall of North India has recently been discussed in a paper published in the third part of the *Indian Meteorological Memoirs*. In this I have shown that no distinct relation whatever between the sun-spots and the rain brought by the summer monsoon can be traced, but that there is some evidence in favour of an inverse relation between the area of the spots and the winter rain, the latter being generally heaviest a year or two before the spots reach their minimum. In this respect the winter rain-fall of North India and other subtropical countries resembles the temperature of stations lying between the tropics, these places being generally hottest about a year before the sun-spot minimum. The simplest explanation of this relation is that in hot years a larger proportion of vapour than usual is raised between the tropics and transported by the upper current to North India and the Himalaya, where it is precipitated during the winter months.

It is by no means true, as some people have suggested, that Indian famines always occur about the time of minimum sun-spot, and that a careful study of the surface of the sun would enable us to predict them. Taking all the famines and scarcities that have occurred in Upper India since the commencement of British rule, as given in Mr. Girdlestone's *Past Famines of the North-Western Provinces*, together with a list of those that have occurred since his report was written, we may classify the years in which they occurred according to the character of the sun-spots as follows:—

FAMINES recorded in the NORTH-WESTERN PROVINCES, classified according to SUN-SPOT CHARACTER.

Sun-spot Area.	Famines and Scarcities.	Total Number.
Maximum - -	1803–4, 1819, 1827–28, 1837–38, 1860–61 -	5
Medium - - -	1813–14, 1825–26, 1868–69, 1873–74 - -	4
Minimum - -	1783–84, 1832–34, 1867, 1877–78 - -	4

The table shows that famines due to the failure of the summer rains are just as likely to occur at one part of the sun-spot cycle as at another, or that if famines be any more probable at one time than at another they are rather more likely to occur when sun-spots are numerous than when they are few. This conclusion is directly opposed to the usual theory on the subject. It may be objected that in this table great famines are classed together with the local scarcities like that of 1867 in Kumaun and that of 1873–74 in Gorakhpur and Behar. When our attention is restricted to the four great droughts of the period, however, we arrive at exactly the same results. Two of these, the first and the latest, occurred at minimum sun-spot epochs, and the other two, those of 1837–8 and 1860–1, at times of maximum sun-spot.

An attempt has been made to calculate the mean rain-fall of the North-Western Provinces for each of the past 35 years in terms of the average for many years. The results are here given in the variations of the winter and summer rains as well as of the annual fall being shown. The winter rain of any year means that which fell between November of the preceding year and April of the given year.

MEAN RAIN-FALL of the NORTH-WESTERN PROVINCES for each YEAR from 1844 to 1878, in PER-CENTAGES of the AVERAGE for many YEARS.

Year.	Number of Stations.	Winter.	Summer.	Whole Year.
1844 - -	28	?	87	?
1845	29	143	91	96
1846 - -	29	66	106	102
1847 - -	28–29	76	105	103
1848 - -	29–30	72	73	73
1849 - -	30–31	92	90	90
1850 - -	31–38	160	87	94
1851 - -	38	183	82	91
1852 - -	38	109	94	95
1853 - -	38	117	91	93
1854 - -	35–38	61	123	117
1855 - -	34–35	172	101	107
1856 - -	7–11	49	129	122
1857 - -	10	86	97	96
1858 - -	9	63	101	98
1859 - -	9	150	89	95
1860 - -	9–30	76	54	56
1861 - -	26–32	23	128	118
1862 - -	27–32	65	123	118
1863 - -	39–40	54	115	109
1864 - -	40	71	69	69
1865 - -	40–41	147	95	100
1866 - -	41	103	92	93
1867 - -	42	91	135	131
1868 - -	42	146	66	73
1869 - -	42–43	109	97	98
1870 - -	43	103	121	119
1871 - -	43–44	61	131	125
1872 - -	44	152	111	115
1873 - -	44	46	101	96
1874 - -	44	71	131	126
1875 - -	44	70	114	110
1876 - -	43–44	46	93	89
1877 - -	39	174	45	57
1878 - -	39	217	90	102

The per-centage for each year has been arrived at in the following way. Let r_1, r_2, r_3, ... r_n be the rain-falls of a number of stations for the given year,

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and let the averages for the same places be R_1, R_2, R_3, ... R_n respectively. Then—

$$\text{Per-centage} = 100 \times \frac{r_1 + r_2 + r_3 \ldots + r_n}{R_1 + R_2 + R_3 \ldots + R_n}$$

For most of the years where 28 or more stations have been taken into account, the figures may be taken as fairly accurate, but for the years 1856–60 there is a large probable error. No records for any of the plains stations during those years have been discovered, and the figures in the table are founded on observations taken at a few places in Kumaun and Dehra Dun, supplemented by returns from three or four stations in the Punjab and from Jabalpur in the Central Provinces.

The first conclusion to be drawn from the table is that, so far as past experience enables us to judge, it is not likely that more than six dry years or six wet ones will ever occur in succession. The longest dry period in the table included the six years from 1848 to 1853, and the longest wet period extended from 1870 to 1875.

There is also a considerable balance of evidence in favour of a rule that when the winter rains have been unusually heavy the succeeding rains of the summer monsoon will be light, and *vice versâ*. The following 12 years had the winter rain-fall excessive, and that of summer defective, viz., 1845, 1850, 1851, 1852, 1853, 1859, 1865, 1866, 1868, 1869, 1877, 1878; and 13 years, 1846, 1847, 1854, 1856, 1858, 1861, 1862, 1863, 1867, 1871, 1873, 1874, 1875, had dry winters followed by wet summers. Against these 25 instances in favour of the rule there were only three years, 1855, 1870, and 1872, with the rain-fall excessive in both seasons; and six, 1848, 1849, 1857, 1860, 1864, and 1876, with a deficiency both in summer and winter. In his report on the meteorology of India for 1876, Mr. Blanford has suggested a reason for the inverse variation of the rain-fall of the winter and summer seasons. It is that an unusually great precipitation of snow on the north-west Himalaya, accompanying heavy winter rains, will retard the rise of temperature over Northern India in April, May, and June, and thus prevent to some extent the diminution of pressure that causes the indraught of the vapour-laden winds from the south. On the other hand, when the snow-fall has been less than the average, the temperature will rise, and the pressure decrease more than usual, and the southerly winds of the summer monsoon will be unusually strong. The explanation is, however, incomplete, for the year 1871, in which the winter rains were light and those of the summer were far heavier than usual all over North India, was characterised by a very low temperature in April, May, and June; whereas 1878, a year of heavy winter and scanty summer rains, had the hottest June ever recorded. Although this relation between the rains of the cold and hot seasons has not yet been satisfactorily explained, it may for the present be adopted as a fairly good empirical rule, the exceptions to which are not likely to be very numerous.

The winter rain-fall of the province is seen to be much more variable in amount than that of the summer season, the former ranging from 22 to 217 per cent. of the average, while the latter only ranges between 45 and 135 per cent. Owing to the inverse relation between the rain-falls of the two seasons, already pointed out, the annual totals on the average of the whole province have a still smaller range, the maximum being only 31 per cent. above the mean, and the minimum 44 per cent below it.

Nevertheless, at individual stations, the variability of the annual totals is extremely great, as the following examples will show. The highest rain-fall at Dehra, in any year for which we have complete returns, was 112·6 inches in 1853, and the lowest was 35·1 inches in 1848. At Naini Tal the rain-fall ranged between 131 inches in 1853 and 30·1 in 1860. On the plains the variability is almost as great. Thus, at Meerut the rain-fall in 1870 was 40 inches, and in 1868 only 15·6; at Bareilly 58·8 inches fell in 1878, and only 23·7 in the previous year; at Agra 46·5 inches fell in 1873, and only 9·8 inches in 1877. Farther east, we have for the maximum at Allahabad 61 inches in 1854, and for the minimum 15·7 in 1864; at Benares 64·4 inches in 1848, and only 19·5 inches in 1864; and at Jaunpur a range from 74 inches in 1871 to 7·6 in 1846.

In the Jhánsi division and in Oudh, although the observations for these are for a smaller number of years, the variability of the annual rain-fall appears to be quite as great as in the districts for which the records go back to 1844. Thus, at Jhánsi the rain-fall of 1868 was only 13·3 inches, while that of the next year amounted to 52·3 inches; at Lucknow 64·9 inches fell in 1871, and only 14·4 in 1877, and at Fyzabad the figures for the last 10 years range between 87·2 inches in 1871 and 17·4 in 1876.

In years when the average rain-fall of the whole province is below the mean, some districts are subject to unusually heavy local falls. In 1877, for example, when the average summer rain-fall for the whole province was less than half the usual amount, there was a succession of heavy downpours in Jaunpur, which brought the rain-fall of the summer months at that station nearly up to the average. In like manner, a succession of very heavy falls of rain in July and August 1878 rendered the totals for these months at Bareilly, Dehra, and Mussoorie very excessive, while the rain-fall of the same months was deficient in amount over nearly all the rest of the province.

It has been pointed out by Mr. Blandford that these irregularities of rain-fall distribution (which are also observed in rainy years, though they are then not so striking) appear to be determined by certain minute but persistent differences of atmospheric pressure which modify the directions of the prevailing winds, and thus send unusually large quantities of vapour to be precipitated over well-defined local areas. Many of these pressure differences are already established at the commencement of the rainy season, and others originate during its continuance, but once set up they usually persist for several months or even years. Thus an accurate knowledge of their amount and distribution, combined with a knowledge of the probable general character of the coming monsoon, derived from observations taken over the whole of India and the Indian seas, may one day afford a basis for foretelling the distribution of the rain-fall before the commencement of the summer monsoon.

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Mr. Pedle

After giving an account of the normal distribution of wind and rain-fall and their causes in the Province of Bengal, a description mainly drawn from Mr. Blandford's reports, and which therefore need not be repeated here, he goes on thus:—

We must now take up each division in turn and describe the normal rain-fall and prevalent winds, and how they differ one from another. It is believed that considerable reliance may be placed upon the accuracy of the statements of rain-fall, &c. which are afterwards given; for each sadar and subdivisional station is furnished with a Symon's rain-gauge, which is of the simplest construction, and is therefore very little liable to get out of order, and which is again so simple in principle that it is difficult to imagine that any mistake can be made in its readings. The rain-fall recorded by these instruments is daily registered, and the reports are in most cases forwarded to this office through the civil officer in charge of each division. The other statistics here given, such as

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wind directions, &c., are obtained from the records kept by the meteorological observers at the various stations under this department, and which are also believed to be very fairly accurate. It will be convenient to commence with the divisions from the eastward, working towards the west; and it will be seen below that in this way we shall follow as nearly as possible what may be called the natural sequence, commencing with the district having the greatest rain-fall, working down to that with the smallest. Thus we have the following divisions with their rain-fall, working from east to west:—Assam,* 115 inches annual rain-fall; Chittagong, 100 inches; Dacca, 76 inches; Cooch Behar, 134 inches; Rajshahye, 72 inches; Presidency, 58 inches; Burdwan, 57 inches; Bhagulpore, 52 inches; Orissa, 60 inches; Chota Nagpore, 49 inches; and Patna, 45 inches. There are only two exceptions to this sequence, that is, Cooch Behar and Orissa, and these two are exceptional—the first, because it includes the Himalayan stations, and the second, because a large proportion is on the sea-coast.

Chittagong.—This division is, next to Assam, the most easterly, and, as before stated, it receives also a large proportion of rain-fall. This division is represented by the following rain-fall stations:—Chittagong, Cox's Bazar, Noakholly, Comillah, Brahmanberiah, Rangamatee Hill, and Hill Tipperah; and rain-fall observations have been made in these stations for periods varying from 4 to 20 years. Most of these stations are at or near the sea level, many lie almost on the sea-cost, whilst to windward of them there is a range of mountains that runs obliquely across the path of the south-west monsoon, and which materially alters its direction. Speaking generally, we may say that the northern stations of this division receive a larger share of rain-fall than the southern. The winds in the Chittagong district are strongly northerly during the months from November to February inclusive, but in March and April the southerly element predominates, and the south-west monsoon commences here in April and continues to blow steadily for seven months; owing partly perhaps to the obstacle presented by the Arracan Mountains to the progress of the south-west monsoon, or perhaps to a greater extent to the low barometric pressure in the Gangetic delta, the wind directions in this division are south-east and south-south-east during the greater part of the monsoon months, and apparently the wind is more easterly in the northern parts than in the southern. The rains begin earlier at the northern than at the more southerly stations, for at the latter little rain falls in April, and that in May is usually light.

The average monthly rain-fall for the whole of this division, together with the average rain-fall of some of the principal stations, are here given—

RAIN-FALL in the CHITTAGONG DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Averages† - -	4 to 19	0·71	0·88	2·04	4·96	10·37	22·17	21·11	18·25	11·99	6·89	0·87	0·21	100·40
Chittagong - -	17 to 19	0·59	1·31	1·31	4·71	9·17	22·53	22·17	21·46	12·94	6·31	1·71	0·39	104·60
Noakhally - -	17 to 19	0·47	0·80	2·09	3·86	9·91	22·67	20·99	20·26	15·92	8·37	1·42	0·11	106·87
Tipperah - -	14 to 16	0·79	0·83	2·49	7·05	11·42	19·06	16·76	15·28	9·77	6·14	1·35	0·08	91·02
Rangamattee Hill -	8	0·43	0·83	2·33	4·46	10·30	17·52	18·17	18·38	11·19	7·85	1·23	0·22	92·91
Hill Tipperah -	4 to 5	1·35	0·98	3·29	5·24	10·13	14·43	10·88	16·37	8·03	4·22	1·17	0·20	76·29

† Average of whole division.

The division of Chittagong is thus well supplied with rain, as, on the average, 100·40 inches are recorded; this is fairly distributed in the whole division, and is usually spread over from six and seven months, the three months June, July, and August being as a rule the wettest.

Dacca.—In this division we have chiefly low-lying lands which receive the monsoon currents direct from the Bay of Bengal, and therefore the average rain-fall is fairly high. The number of recording rain-fall stations has varied from 11 to 14, and the number of years over which observations have been taken has been in the larger stations 16, but in the subdivisional stations only four years. The principal stations may be considered to be Dacca, Furreedpore, Burrisal, and Mymensingh, and these may be accepted as typical of the whole district.

This division is one in which the rain-fall is very equally distributed, and in some respects it is like that of Chittagong. As before, the average winds work round from north-west in January through west and south to south-south-east, remaining in this direction almost throughout the rains, then passing through east almost suddenly to north at the end of October or commencement of November. In April the wind becomes on the average south, and at this time the rain-fall commences and continues until October; the largest amount falling in June and July. The rain-fall varies from about 70 to 95 inches, as is shown by the following table which gives the average monthly rain-fall of the whole division, and also the rain-fall of some of the principal stations:—

RAIN-FALL in the DACCA DIVISION in INCHES.

Names of Stations.	Number of Years of Observations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 16	0·71	1·12	1·79	4·23	8·50	16·48	15·27	12·74	10·57	4·86	0·20	0·13	76·60
Dacca - -	23 to 25	0·29	0·83	2·33	6·44	9·51	12·82	11·64	12·10	9·52	5·51	0·75	0·18	71·92
Furreedpore -	8	0·54	0·96	2·32	4·83	9·34	13·49	11·33	12·46	11·02	3·95	0·26	0·01	70·51
Burrisal - -	8 to 9	0·78	1·14	1·70	2·79	6·75	15·17	16·78	12·83	10·40	4·49	0·89	0·17	73·89
Mymensingh -	10 to 12	0·35	1·09	1·44	7·09	13·89	22·07	16·39	14·78	12·99	4·85	0·13	0·05	95·12

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* The report on the rain-fall of Assam is described in a report submitted to that Government.

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This table clearly shows that in its progress westwards the average rain-fall is steadily diminishing, although this is perhaps not quite so marked as in some cases that will be quoted from subsequent divisions.

Cooch Behar.—In this division we have a marked example of the influence of hills and mountain ranges in increasing the rain-fall of a district. The average annual rain-fall of this division is 134·57 inches, the highest in fact of any division here treated of. There are here five rain-fall recording stations, namely, Darjeeling, Julpigoree, Cooch Behar, Buxa, and Boda. All these stations are situated either in the hills or at the foot of them, and it will be seen that in each case we have heavy rain-fall. The wind directions are only recorded at one station, namely, Darjeeling, and here for the first five months in the year there is a great preponderance of westerly winds, which, however, in June change round to the south and remain at or about this quarter until October, when the wind direction again turns towards the west. Slight rains commence in this division in April and May, but the monsoon months are really June, July, August, and September; comparatively small quantities falling in October. In this division the rain-fall is not uniform, nor could it be expected to be so, for some of the stations are on the plains and others in the hills. Thus at Buxa there is an annual fall of 238·90 inches, whilst at Boda only 88·07 inches fall: Buxa is on the hills, Boda is on the plains. The following table shows the average monthly rain-fall for the whole division, as also for the five stations above mentioned:—

RAIN-FALL in the COOCH BEHAR DIVISION in INCHES.

Names of Stations.	Number of Years of Observations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 7	0·73	0·41	1·34	5·53	10·46	30·14	29·60	26·59	22·81	6·73	0·11	0·12	134·57
Darjeeling - -	14 to 17	0·35	1·00	1·25	3·78	6·10	24·80	27·22	24·60	15·81	7·24	0·17	0·15	112·47
Julpigoree - -	7 to 8	0·47	0·28	1·75	4·45	9·12	30·46	25·42	23·67	23·76	6·23	0·02	0·03	125·66
Cooch Behar -	5 to 6	0·56	0·13	0·62	6·95	12·09	35·72	21·85	21·76	16·14	5·38	0·05	—	121·25
Buxa - -	8	0·90	0·85	1·68	9·15	18·82	46·59	54·41	43·99	33·68	11·33	0·55	0·50	222·43
Boda - -	6 to 7	0·60	0·27	0·63	2·59	7·36	21·04	14·91	17·38	16·26	6·85	—	0·08	87·97

Here we have a division far removed from the sea, yet standing at the head in the list of rain-fall. This is caused by the fact previously stated, that when air laden with moisture rises it expands and is thereby cooled, and by the fall of the temperature a large proportion of the vapour is deposited in the form of rain, and though in this instance the monsoon current has deposited part of its moisture by passing over a large portion of land surface, yet when it rises and becomes cooled, a further and generally larger quantity of rain is again produced.

Rajshahye.—This division is situated at some little distance to the south and east of the hills, and yet their influence is not altogether unfelt; for it appears that the rainfall in many of the Rajshahye stations is higher than others in the same latitude in the Gangetic delta. This is probably owing to the influence of the hills on the north and north-east which obstruct and deflect the monsoon current, and thus increase the precipitation of its vapour; consequently there is a larger fall of rain in the division than would otherwise be the case. There are here 10 rain-fall recording stations which have been established for periods varying from 5 to 20 years. There is now only one wind direction record kept in this district; but up to 1874 Berhampore was included in this division (it is now, however, in the Presidency division), and the records from this station show that from May to September south-east winds probably prevail in Rajshahye. The rains are heaviest here from June to September, but a fair quantity also falls in May and October.

The rains are here somewhat unequally distributed, as is shown by the following table, giving the average monthly rain-fall for the whole division, and the average for several of the larger stations:—

RAIN-FALL in the RAJSHAHYE DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	5 to 20	0·52	0·92	1·09	3·34	6·68	15·21	14·67	12·48	12·37	5·09	0·30	0·11	72·78
Dinagepore -	13 to 16	0·20	0·66	0·60	2·80	7·25	19·16	15·43	13·19	12·67	6·68	0·02	0·04	78·70
Maldah - -	18 to 20	0·46	0·85	0·86	1·86	3·21	9·85	10·16	9·56	10·71	4·50	0·18	0·40	52·60
Bauleah -	14 to 17	0·30	1·19	1·18	1·95	5·76	11·01	12·29	10·27	10·85	5·24	0·25	0·04	60·33
Rungpur - -	14 to 16	0·39	0·33	0·95	3·11	9·81	21·86	16·65	13·40	11·64	5·43	0·04	0·12	83·73
Bogra - -	12 to 15	0·58	1·03	0·75	4·63	9·09	16·58	16·55	11·21	13·58	5·46	0·29	0·10	79·85
Pubna - -	9 to 10	0·44	0·71	1·26	4·54	7·38	12·29	10·61	11·35	10·83	4·47	0·10	0·02	64·00

Speaking generally, we may say that, other things being equal, the easterly and northerly stations in this division receive more rain than the westerly and southerly ones, and also that the rains usually begin somewhat earlier in the former than in the latter stations.

Presidency Division.—We have here a division in which the average rain-fall is fairly equally distributed; there are some 26 recording stations, and in some instances records for as long as 47 years are available; but in the case of the subdivisional stations only four years' observations have been recorded. Here, as before, the wind direction passes from the north or north-west in January through west to south in April, but it is not till June that the wind becomes full south or somewhat east of south; and it is by the wind current from this latter quarter that the larger proportion of rain is brought. In October the wind veers round again to the north and the rains cease. The rain-fall usually commences in the south part of this division in the second or third week in June, and ceases about 15th October; in the northern parts of this district the rains commence somewhat later and end rather earlier. The principal rain-fall in this

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district occurs in the three months June, July, and August; smaller quantities falling in September, October, and May. The diminishing quantity in the two former months is due to the slackening of the monsoon current, and the rain-fall in May is principally due to the class of storms called "north-westers." Winter rains are somewhat rare in the southern part of this division.

The table below contains the average monthly rain-fall for the whole division, and also the averages of some of the principal places :—

RAIN-FALL in the PRESIDENCY DIVISION in INCHES.

Names of Stations.	Number of Years of Observations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 47	0·57	1·10	1·31	2·73	5·15	11·63	10·70	10·98	8·43	4·96	0·32	0·10	57·98
Saugor Island -	9 to 10	0·18	0·76	1·07	1·59	4·62	12·72	14·63	14·26	13·07	10·94	0·66	0·05	74·55
Calcutta - -	48	0·43	0·87	1·35	2·39	5·40	12·08	12·78	13·94	10·18	5·61	0·55	0·23	65·81
Alipore - -	6 to 7	0·33	1·69	2·20	2·09	4·49	11·22	13·23	13·97	9·09	6·29	0·30	0·09	64·99
Kishnaghur -	12 to 14	0·59	0·89	1·04	4·06	7·18	11·38	10·13	10·20	6·85	4·24	0·07	0·15	56·78
Jessore - -	14 to 17	0·59	0·62	1·67	3·68	7·36	13·48	10·75	11·50	8·78	5·62	0·73	0·12	64·90
Berhampore -	19 to 21	0·42	0·90	1·09	2·32	4·22	9·91	10·02	10·21	9·41	5·64	0·16	0·08	54·38

In this division we may notice generally that, other things being equal, the southerly stations receive a larger proportion of rain than the northerly, and the easterly stations a larger proportion of rain than the westerly.

Burdwan.—This district in position and general condition is similar to the Presidency division, and like it receives a moderate rain-fall; the average for the whole of the Presidency division being 57·98 inches, whilst that of the Burdwan division is 57·11 inches. There are 15 rain-fall recording stations in this division, and the period during which registration has been effected varies from 4 to 20 years. The rain-fall in this district is tolerably uniformly distributed, and it is brought by winds from the same direction as those described for the Presidency division; if anything, the direction in the Burdwan district is rather more easterly. As before, the months in which the largest amount of rain falls are June, July, August, and September, and these are the months which are characterized by south-east and south-south-east winds; it is in fact from this quarter that the larger proportion of the monsoon rain comes. In October and May also there is a moderate rain-fall, the former being brought by the close of the monsoon, and the latter principally by the storms known as north-westers. The period of the commencement of the monsoon is about the same as that given for the Presidency district; but as before, in the southern portion of the division, the monsoon commences rather earlier than in the northern part.

In the following table we have the average monthly rain-fall for the whole division, and also the average for some of the principal stations :—

RAIN-FALL in BURDWAN DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 20	0·56	1·30	1·42	2·16	4·14	10·00	11·47	11·65	8·62	5·29	0·33	0·17	75·11
Burdwan - -	14 to 16	0·67	1·10	1·58	2·80	4·51	11·07	12·44	11·78	8·51	5·40	0·24	0·52	60·62
Bankoora - -	17 to 19	0·33	1·13	1·66	1·72	3·44	10·08	12·62	10·58	8·63	5·29	0·38	1·00	56·86
Sooree - -	13 to 14	0·48	0·93	0·72	0·86	2·34	9·62	12·95	12·62	9·39	4·18	0·13	0·13	54·35
Midnapore -	11 to 13	0·72	0·46	1·54	1·67	5·49	11·43	11·60	10·93	8·66	6·14	0·43	0·01	59·08
Hooghly - -	12	0·61	1·48	2·18	3·68	5·23	10·65	11·97	12·31	7·88	3·94	0·41	0·15	60·49
Howrah - -	8 to 19	0·49	1·52	2·79	2·31	3·95	12·71	12·99	13·00	10·00	5·05	0·35	0·10	65·26

Speaking generally, we may say that the rain-fall of this division varies between 50 and 70 inches, and that the stations in the south, and therefore near the sea-coast, receive a heavier rain-fall than the northern ones. There is also apparently a diminution of rain-fall from the east towards the westerly portion of this division, but this is perhaps not so marked as is the case in the other divisions.

Bhagulpore.—This is one of the Behar divisions, and is therefore situated at a considerable distance from the sea, and consequently the rain-fall is here less than in the divisions formerly discussed. The wind directions are determined at two stations, Monghyr and Purneah, and throughout the early months in the year there is a decided preponderance of westerly winds; it is not till July that the wind becomes south-east and south-south-east, when it is from this quarter that the greater part of the rain comes; the easterly element is here stronger than in the more southerly divisions. In this division there are 15 rain-fall recording stations which have sent in returns from periods varying from 4 to 20 years, and the average monthly result obtained from these, together with the average rain-fall of some of the principal stations, are herewith given in a tabular form :—

RAIN-FALL in the BHAGULPORE DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 20	0·51	1·26	0·51	1·06	2·96	9·09	12·72	11·24	9·90	3·26	0·03	0·04	52·58
Monghyr - -	19 to 20	0·39	0·57	0·42	0·42	1·55	6·12	11·51	10·90	8·05	3·61	0·04	0·10	43·68
Bhagulpore - -	18 to 19	0·46	0·57	0·34	1·09	2·26	8·47	11·03	10·73	7·67	5·05	0·01	0·08	47·76
Purneah - -	6 to 7	0·40	0·43	0·21	1·84	2·56	12·36	14·90	13·62	10·98	3·88	—	0·05	61·23
Mya Doomka -	6	0·44	0·72	0·71	1·19	3·39	10·72	13·51	13·78	9·49	3·08	0·01	0·03	57·07

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From this table it will be seen that no heavy rain-fall takes place in this division until June, and generally towards the close of this month, whilst the rains almost cease by the beginning of October; the wettest months are July and August, and in September it is clear that there is a weakening of the monsoon current.

Speaking generally, the stations in the south and east of this division, and those lying nearest to the line of the Himalayas, receive a greater rain-fall than those in the west. This is illustrated by the fact that Purneah receives an annual rain-fall of 61·23 inches, whilst Monghyr receives only 43·68 inches. The former station is only 65 miles from the foot of the Himalayas, whilst Monghyr is, more or less, protected from the monsoon winds by the rocky and elevated country of Hazaribagh, which stretches to the south of this district. The average rain-fall of this division may be said to vary between 40 and 60 inches.

Orissa.—This division, although one of the most westerly in the provinces under the Lieutenant-Governor of Bengal, receives ordinarily a fairly large proportion of rain, larger indeed than the three divisions previously described. This is, however, accounted for by the fact that it lies on the sea-coast, and therefore receives its portion of the monsoon current in its original humid condition.

As might be expected, the wind directions are here somewhat different to those of other districts. In January the wind instead of being north-west or north is usually north-east, whilst as early as February the influence of the south winds begins to be felt; in March they blow steadily from a decidedly south-westerly direction, and continue at or almost this quarter until September; at the middle or end of October the wind goes round to the north-west, and continues northerly until the end of the year. In this division the rain is brought entirely by south-westerly winds instead of by south-easterly winds, as is the case in most of the other divisions of this province.

There are 10 rain-fall recording stations here, and the periods for which observations are available vary between 4 and 19 years. The average monthly rain-fall for the whole division and for some of the principal stations is shown in the following table:—

RAIN-FALL in the ORISSA DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 19	0·51	0·73	0·82	1·62	2·83	10·37	12·98	11·46	9·64	7·59	1·34	0·22	60·11
Cuttack - -	16 to 18	0·54	0·35	0·94	1·52	2·09	10·39	12·32	10·89	9·68	6·50	0·98	0·52	56·63
False Point - -	10	0·46	0·58	1·19	1·42	2·58	11·36	16·06	13·51	11·41	13·73	3·11	0·13	76·04
Pooree - -	17 to 20	0·22	1·15	0·61	1·14	2·27	7·99	9·43	11·85	9·29	8·45	1·98	0·72	55·10
Balasore - -	14 to 16	0·94	1·24	1·68	2·54	4·26	10·54	11·22	12·20	12·27	7·48	0·59	0·12	65·78

The rain-fall of this division may be said to vary between 50 and 75 inches, and other things being equal, the stations near the sea-coast will receive a heavier fall of rain than those in the interior. This is clearly shown by the pair of stations, False Point, which is on the coast, and which has an average annual rain-fall 76·04 inches, and Cuttack, which is some 50 miles inland, only receives 56·63 inches.

Chota Nagpore.—This division includes a considerable tract of elevated land, which in the case of Hazaribagh is as high as 2,010 feet. Most of the country is indeed, more or less, elevated and undulating, and also much covered with jungle. As might therefore be expected, the meteorological conditions of different parts of the division vary somewhat according to the elevation and position of the stations.

At one station only in this division is the wind direction recorded, and these observations have been made for the last 10 years. Starting in January with a well-defined north-westerly wind, it generally becomes more and more westerly until June, when it becomes south-west, and from this quarter the first considerable quantities of rain come; the wind afterwards becomes more southerly, and in September south-easterly, but in October it passes back to the north-west direction. It is during July and August that the greater part of the rain falls, when the wind is nearly south, whilst by the beginning of October the rains have almost ceased. During the cold weather months also usually small quantities of rain fall, but this is apparently due to the winter anti-monsoon current, as was explained in the general description of monsoon currents in Bengal. This division is represented by seven rain-fall recording stations from which statistics are available for periods varying from 4 to 20 years.

The average monthly rain-fall of the whole division, together with that of some of the principal stations, is here given in a tabular form:—

RAIN-FALL in the CHOTA NAGPORE DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 20	0·61	0·94	0·85	0·76	1·64	8·64	12·95	11·75	8·23	3·43	0·09	0·10	49·99
Hazaribagh -	15	0·48	0·69	0·62	0·35	1·00	8·62	13·05	12·33	7·26	3·60	0·24	0·09	48·33
Ranchee - -	16 to 18	0·92	1·04	1·31	0·58	1·52	7·43	12·50	10·90	7·81	3·45	0·13	0·09	47·68
Chybassa - -	7 to 8	0·69	0·83	1·24	0·95	2·90	8·62	13·61	12·03	9·47	4·17	0·14	0·12	54·77
Purulia - -	10 to 12	0·55	0·78	0·78	0·93	1·53	8·55	11·36	11·92	6·80	4·37	0·08	0·19	47·84

The rain-fall of this division may be said to vary between 45 and 55 inches, about one-half of which is usually received in the two months July and August. Generally speaking, there is a diminution in the amount of rain-fall in the stations from east to west and from north to south. Thus Hazaribagh has a mean rain-fall higher than Manbhoom, which is situated 70 miles to the eastward, and Chybassa again has an annual rain-fall 6 or 7 inches higher than Hazaribagh, which is 100 miles to the northward. As a rule, the monsoon commences rather later and closes rather sooner in the district of Chota Nagpore than it does in the more southerly and westerly districts of Bengal.

Patna.—This is the most westerly and northerly of the divisions in this province, and therefore, as before pointed out, the average rain-fall will be the smallest. In all the Behar stations the mean rain-fall is low, and in most respects their climate is similar to that of the North-Western Provinces. In this division there are two stations, Patna and Gya, at which the wind directions are recorded, and the average of 10 years observations at these places shows that, as in the case of Chota Nagpore, in the early months of the year there is a strong preponderance of westerly winds; there is, however, one very curious point about the wind directions here, that following on the westerly winds we have northerly and north-easterly ones, and finally in July the winds become almost due east. This change of direction is the reverse of what usually occurs. At the end of July the winds become south-east or east-south-east, and it is from this quarter that the vapour-bearing current reaches this division. In October the wind again goes round to the north-west and the rains cease. Before, however, the south-east and east-south-east winds can reach the division, they have to pass over a small tract of elevated ground as that in the Sonthal Pergunnah district, and consequently they have already deposited a considerable portion of their moisture before reaching this division. The rain-fall here is accordingly light, varying from nearly 40 up to 55 inches. In this district there are 22 rain-fall recording stations which have furnished returns for periods varying between 4 and 29 years. The average monthly divisional rain-fall, together with that of some of the principal stations in the division, is given in the following table:—

RAIN-FALL in the PATNA DIVISION in INCHES.

Names of Stations.	Number of Years of Records.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Divisional Average	4 to 20	0·63	0·45	0·46	0·54	1·45	7·71	12·12	10·73	8·57	2·34	0·02	0·09	45·11
Patna - -	17 to 19	0·65	0·49	0·25	0·30	1·32	6·87	9·77	8·51	7·47	2·63	0·13	0·15	38·54
Gya - - -	11 to 13	0·72	0·44	0·47	0·35	0·40	6·17	11·78	9·72	6·89	3·32	—	0·09	40·35
Arrah - -	17 to 19	0·84	0·45	0·59	0·76	1·06	7·10	12·91	10·04	9·65	2·63	0·21	0·07	46·31
Mozufferpore -	13 to 15	0·71	0·33	0·62	0·63	1·87	6·26	10·51	9·68	9·16	3·67	0·03	—	43·47
Durbhunga - -	6	0·33	0·18	0·36	0·88	1·69	7·24	12·89	9·84	10·90	1·81	—	0·07	46·19
Chupra - -	17 to 20	0·68	0·35	0·50	0·52	0·93	5·93	8·77	8·79	7·03	2·62	0·02	—	36·14
Motihari - -	11 to 12	0·37	0·18	0·83	0·67	2·38	8·81	10·34	11·31	9·27	3·87	—	0·14	48·17

In this division the rain-fall appears to be more generally distributed than is the case in the other divisions, and it is difficult to trace any general principle in the slight variations which occur; apparently however, a line through the middle of this division following nearly the course of the Ganges will represent the line of least rain-fall, whilst north and south of this there is increased precipitation of rain.

The monsoon commences in this division about a fortnight later, and ends rather earlier than in South and Eastern Bengal, and the greater portion of the rain-fall is in the months of July and August. This division also usually receives a certain portion of the winter rains brought by the winter anti-monsoon current.

In concluding our review of the rain-fall of these divisions, we may make the following general statements. It may be comprehensively said that the rains brought by the south-west monsoon commence earlier and fall in larger quantity and with greater regularity in the divisions to the east of these provinces, and that they commence later and diminish in quantity and also in regularity in passing towards the western districts; so that the eastern divisions are altogether more moist than those of the west; and that in all probability the western and north-western divisions of this province will always be more subject to drought and famine than those to the east.

The following two tables are a resumé of the results as given above; they show in the first table the average monthly wind directions of stations in each division, and in the second table the average monthly divisional rain-fall:—

AVERAGE WIND DIRECTIONS in BENGAL.

Names of Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Sibsagar -	N. 63° E.	N. 65° E.	N. 64° E.	N. 56° E.	N. 44° E.	N. 89° E.	S. 34° W.	N. 6° E.	N. 67° E.	N. 72° E.	N. 63° E.	N. 74° E.
Goalpara -	S. 89 E.	N. 86 E.	N. 80 E.	N. 87 E.	S. 86 E.	S. 76 E.	S. 55 E.	S. 15 E.	S. 67 E.	S. 85 E.	S. 87 E.	S. 87 E.
Silchar -	S. 22 E.	S. 33 E.	S. 60 E.	S. 82 E.	N. 71 E.	N. 57 E.	N. 21 E.	S. 49 W.	S. 42 W.	S. 46 E.	S. 74 E.	S. 55 E.
Chittagong -	N. 26 W.	N. 40 W.	S. 60 W.	S. 13 W.	S. 7 W.	S. 30 E.	S. 42 E.	S. 31 E.	S. 27 E.	N. 19 W.	N. 19 W.	N. 24 W.
Dacca -	N. 50 W.	S. 79 W.	S. 22 W.	S. 8 E.	S. 21 E.	S. 19 E.	S. 21 E.	S. 16 E.	S. 78 E.	N. 74 E.	N. 17 W.	N. 34 W.
Darjeeling -	S. 50 W.	S. 65 W.	S. 67 W.	S. 68 W.	S. 51 W.	S. 14 W.	S. 12 E.	S. 13 E.	S. 23 W.	S. 48 W.	S. 38 W.	S. 38 W.
Calcutta -	N. 38 W.	S. 81 W.	S. 32 W.	S. 3 W.	S. 11 E.	S. 4 E.	S. 11 E.	S. 17 E.	S. 27 E.	N. 48 W.	N. 17 W.	N. 26 W.
Saugor Island	N. 7 E.	S. 68 W.	S. 41 W.	S. 25 W.	S. 17 W.	S. 21 W.	S. 29 W.	S. 27 W.	S. 8 W.	N. 11 E.	N.	N. 12 E.
Jessore -	N. 21 W.	N. 63 W.	S. 66 W.	S. 12 W.	S. 7 E.	S. 18 E.	S. 16 E.	S. 16 E.	S. 23 E.	N. 63 E.	N. 1 E.	N. 10 W.
Berhampore	N. 35 W.	N. 65 W.	S. 79 W.	S. 8 W.	S. 35 E.	S. 37 E.	S. 44 E.	S. 45 E.	S. 45 E.	N. 3 W.	N. 26 W.	N. 26 W.
Burdwan -	N. 38 W.	N. 57 W.	S. 72 W.	S. 39 W.	S. 4 W.	S. 16 E.	S. 21 E.	S. 40 E.	S. 16 E.	N. 16 E.	N. 15 W.	N. 25 W.
Monghyr	S. 72 W.	S. 73 W.	N. 83 W.	N. 45 E.	N. 71 E.	N. 85 E.	S. 84 E.	S. 69 E.	S. 81 E.	S. 82 W.	S. 87 W.	S. 69 W.

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Names of Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Purneah	N. 77° W.	S. 80° W.	N. 81° W.	°—	N. 80° E.	°—	°—	°—	S. 77° E.	N. 49° W.	N. 73° W.	N. 79° W.
Cuttack	N. 64 E.	S. 9 W.	S. 19 W.	S. 16 W.	S. 5 W.	S. 28 W.	S. 42 W.	S. 48 W.	S. 7 W.	N. 30 E.	N. 17 W.	N. 5 E.
False Point	N. 45 E.	S. 27 W.	S. 46 W.	S. 44 W.	S. 36 W.	S. 49 W.	S. 63 W.	S. 63 W.	S. 32 W.	N. 40 E.	N. 20 E.	N. 30 E.
Hazaribagh	N. 64 W.	N. 69 W.	N. 78 W.	N. 73 W.	S. 89 W.	S. 30 W.	S. 13 E.	S. 41 W.	S. 57 E.	N. 48 W.	N. 49 W.	N. 58 W.
Patna	N. 78 W.	N. 75 W.	N. 72 W.	N. 30 W.	N. 41 E.	N. 68 E.	N. 82 E.	S. 67 E.	S. 84 E.	N. 33 W.	N. 66 W.	N. 79 W.
Gya	N. 59 W.	N. 85 W.	N. 89 W.	N. 60 W.	N. 31 E.	N. 84 E.	S. 69 E.	S. 50 E.	S. 76 E.	N. 48 W.	N. 28 W.	N. 65 W.
Durbhanga	—	—	—	—	—	—	—	—	—	—	—	—

AVERAGE RAIN-FALL in the DIVISIONS of BENGAL in INCHES.

Names of Stations.	Number of Stations in Divisions.	Number of Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Assam	21 to 23	4 to 20	0·86	1·83	3·90	9·57	14·53	22·86	23·13	18·05	14·11	9·34	0·68	0·29	115·15
Chittagong	6 to 7	4 to 19	0·71	0·83	2·04	4·96	10·37	22·17	21·11	18·25	11·99	6·89	0·87	0·21	100·40
Dacca	11 to 14	4 to 16	0·71	1·12	1·79	4·23	8·50	16·48	15·27	12·74	10·57	4·86	0·20	0·13	76·60
Cooch Behar	5	4 to 7	0·73	0·41	1·34	5·53	10·46	30·14	29·60	26·59	22·81	6·73	0·11	0·12	134·57
Rajshahye	10	5 to 20	0·52	0·92	1·09	3·34	6·68	15·21	14·67	12·48	12·37	5·09	0·30	0·11	72·78
Presidency	25 to 26	4 to 47	0·57	1·10	1·31	2·73	5·15	11·63	10·70	10·98	8·43	4·96	0·32	0·10	57·98
Burdwan	15	4 to 20	0·56	1·30	1·42	2·16	4·14	10·00	11·47	11·65	8·62	5·29	0·33	0·17	57·11
Bhagulpore	12 to 15	4 to 20	0·54	1·26	0·51	1·06	2·96	9·09	12·72	11·24	9·90	3·26	0·03	0·04	52·58
Orissa	10	4 to 19	0·51	0·73	0·82	1·62	2·83	10·37	12·98	11·46	9·64	7·59	1·34	0·22	60·11
Chota Nagpore	7	4 to 20	0·61	0·94	0·85	0·76	1·64	8·64	12·95	11·75	8·23	3·43	0·09	0·10	49·99
Patna	22	4 to 20	0·63	0·45	0·46	0·54	1·45	7·71	12·12	10·73	8·57	2·34	0·02	0·09	45·11

With reference to the question "within what limits can the rain-fall vary," and also with reference to the three succeeding questions, it must be explained that the Meteorological Department receives no statistics of any kind as to the agricultural conditions of this province; consequently, it is unable to give any detailed or definite information on these subjects. Generally it may be stated that it is not so much the *absolute* amount of rain which is received by any particular district that determines whether the crops are good or bad, but rather that this depends upon the rain which comes, falling at seasonable times. Again, as the time at which rain may be acceptable will vary according to whether the land cultivated is high or low-lying, or whether backward or forward in cultivation, it would be a difficult matter to say exactly when rain is really or generally required.

Also an excessive rain-fall at many parts of the year is just as bad for the crops as a want of rain, and a flood is in all probability as disastrous as a drought.

Again, in the majority of instances, one inch of rain falling daily on four alternate days may do more good than a continued drizzle of half an inch of rain on each of eight consecutive days; and there is no doubt that either of the former would do vastly more good than a violent rain in which 4 inches fall, say, in a couple of hours. Looking at these considerations, it is not possible to do more than advance the most general of all general statements, and say that *in all probability* a variation of more than 10 or even 15 per cent., either above or below the average rain-fall in each month (provided only the fall is seasonably distributed), might not be attended with serious consequences; but that *in all probability* a variation of 25 or 30 per cent. would cause damage, whether the variation was above or below the average fall, and of the two the smaller quantity of rain would produce the greater damage.

The last and only other question which could possibly be dealt with from the records of the Meteorological Department is the second half of the last question in paragraph 1, namely, "what is "the combination of circumstances under which the "worst results have been produced."

Now undoubtedly the worst results which have been produced are those of the two famine years 1865 and 1873, and an examination of the distribution of rain-fall in these two years in comparison with the average fall will perhaps throw some light on this question.

In order to illustrate this difference of the average rain-fall and of the rain-fall of 1865, a map is attached which shows the average rain-fall of Bengal in red lines, whilst the blue figures are the rain-fall of 1865. Inspection of this will show at a glance that the general rain-fall was not very deficient except in Orissa; but Statement I. will show clearly that the rains almost entirely ceased about the middle of September.

The total quantity of rain-fall for the year was not unusually small in the larger part of Bengal, but it fell abnormally and unseasonably. Much rain fell in the early months of the year before it was of much good, for the usual sowing time had not arrived, and the rains which usually fall in the latter end of September and commencement of October, and which are so essential to the crops, entirely failed. The crops, however, in the more humid districts of Eastern Bengal (where the rain-fall commences earlier) ripened notwithstanding the early cessation of the rains; but in the drier districts of Orissa and Western Bengal the crop was prematurely cut off. In Orissa, the general fall of rain having also been very deficient, the results were much worse than in the greater part of Western Bengal.

The season 1873 was also one which was marked by famine in these provinces, and the cause of this

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is clearly shown by the rain-fall statistics of that year.

A chart of the rain-fall of 1873, compared with the average rain-fall of these provinces, was prepared for the Meteorological Report for 1873, from which it appears that, generally speaking, in the year 1873 the rain-fall of Bengal was very deficient. As, however, this chart only shows us the general result of the year, Statement II. has been prepared showing the monthly divisional rain-fall of 1873 compared with the averages of many years.

From this it may be again seen that with rare local exceptions the rain-fall of 1873 was considerably below the average, and that also, as a general rule, the deficiency was not confined to any one portion of the year, but that it was fairly distributed throughout the season. As might be expected, however, the deficiency was not equally distributed throughout the province, and the variations exhibited some peculiar features which led Mr. Blanford to believe that "while the monsoon current as a whole was either "unusually weak or unusually dry, that portion "which came from the Bay of Bengal failed to a "greater extent than that which came from the "Arabian Sea." This failure of the rains was greatest in the division of Rajshahye, where the deficiency amounted to between 40 and 60 per cent. of the average, and in the Bhagulpore division generally it was almost equally great. In Northern Tirhoot the deficiency averaged from 25 to 40 per cent. of the normal fall, but in the Patna division generally, and in the Monghyr district of the Bhagulpore division, the deficiency was not so great, and on the average it was scarcely so much as 20 per cent. In the Chota Nagpore division the fall was somewhat in excess of the average, and at the two stations Hazaribagh and Ranchee the excess amounted to about 15 per cent. Even in these districts, however, the partial failure of the crops, which is said to have happened, appeared to have been produced rather by the early cessation of the rains than by any absolute deficiency in their total quantity.

In the deltaic districts of Lower Bengal the deficiency was on the average from 30 to 40 per cent.; but this amount varied, and in the western district the rain-fall was much nearer the normal amount than in the eastern. In one station on the west, at Sooree, there was indeed an actual excess above the average fall. In the eastern division of this Presidency the deficiency was about 20 per cent. of the average fall; but even this statement is liable to exceptions, for at Noakholly 17 per cent. above the average fell. The greatest local deficiency appeared to be in the Assam Hills, for in the case of Cherapoonjee the rain-fall was no less than 241 inches below the average, or about 46 per cent. of the normal amount. The rain-fall in India in this year appeared to be above the average on a line running nearly north and south through Hazaribagh, Ranchee, Jhansi, and Agra, that is, on or about the line where the monsoon current from the Bay of Bengal meets with the monsoon current coming from the Arabian Sea.

In the two last months of the rains (September and October), which perhaps may be considered almost of the greatest importance from an agricultural point of view, there was very considerable deficiency, and it may be noticed that in those divisions which suffered most from famine that the rain-fall was so considerably deficient as to almost cease in September, and in all probability this early cessation of the rains was one of the chief, if not the chief, cause of the famine which occurred.

Mr. Blanford, in his review of the Meteorology of the year 1873, says, "I think it not improbable that "the dryness of the year was in great part due to a "persistent barometric depression in the south-east "of the Bay, probably extending also both eastward; "but the irregular (barometric) depression in the "upper part of the Gangetic valley, and the high "pressure in Eastern Bengal, were certainly also "influential in the result, as has already been shown "at a previous page of the report."

So far, then, as our present experience goes, it appears that the worst results have been produced by the failure of the latter part of the rains, namely, in the months of September and October, but, as before pointed out, this affects the drier divisions of the western part of this Presidency to a greater extent than the eastern and more humid divisions.

Partial failure of the monsoon at the commencement or at the middle of the rainy season will of course be serious; but it may only be the means of throwing back the crops, and such would be the usual result; but failure of the rains at the close of the monsoon season means destruction of the principal crop of the year, upon which agriculturists in this province principally rely.

No. 1.—Statement showing the Rain-fall of 1865 compared with the Average Rain-fall.

Division.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total of 1865.	Total of Average.
	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.	1865.	Average.		
Chittagong	0·27	0·71	1·15	0·83	0·73	2·04	5·65	4·96	14·13	10·37	28·43	22·17	30·32	21·11	10·08	18·25	7·63	11·99	2·79	6·89	—	0·87	—	0·21	96·71	100·40
Dacca	—	0·71	1·17	1·12	1·18	1·79	21·93	4·23	19·66	8·50	21·28	16·48	24·41	15·27	8·56	12·74	5·44	10·57	1·38	4·86	0·53	0·20	—	0·13	105·01	76·60
Cooch Behar	—	0·73	—	0·41	—	1·34	—	5·53	—	10·46	—	30·14	—	29·60	—	26·59	—	22·81	—	6·73	—	0·11	—	0·12	—	134·57
Rajshahye	—	0·52	2·23	0·92	1·73	1·09	6·35	3·34	9·27	6·68	14·58	15·21	26·85	14·67	8·42	12·48	6·49	12·37	0·52	5·09	—	0·30	0·87	0·11	71·31	72·78
Presidency	0·16	0·57	2·22	1·10	1·99	1·31	3·19	—	15·88	5·15	8·19	11·63	11·09	10·70	6·83	10·98	10·13	8·43	—	4·96	—	0·32	—	0·10	59·68	57·98
Burdwan	—	0·56	2·23	1·30	3·23	1·42	3·93	2·16	10·90	4·14	11·17	10·00	12·45	11·47	6·77	11·65	8·20	8·62	0·17	5·29	—	0·33	0·03	0·17	59·08	57·11
Bhagulpore	0·07	0·51	1·00	1·26	1·47	0·51	2·50	1·06	7·37	2·96	4·92	9·09	16·10	12·72	10·92	11·24	5·50	9·90	—	3·26	—	0·03	0·95	0·04	50·80	52·58
Orissa	0·12	0·51	1·57	0·73	3·27	0·82	2·85	1·62	12·27	2·83	4·92	10·37	5·10	12·98	6·92	11·46	7·25	9·64	0·15	7·59	—	1·34	—	0·22	44·42	60·11
Chota Nagpore.	0·50	0·61	2·50	0·94	1·95	0·85	0·40	0·76	4·20	1·64	5·10	8·64	11·40	12·95	8·30	11·75	4·30	8·23	—	3·43	—	0·09	—	0·10	38·65	49·99
Patna	0·08	0·63	0·63	0·45	1·78	0·46	2·14	0·54	2·75	1·45	2·12	7·71	12·06	12·12	5·98	10·73	2·82	8·57	—	2·34	0·07	0·02	0·25	0·09	30·68	45·11

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No. 2.—Statement showing the Rain-fall of 1873 compared with the Average Rain-fall.

Division.	January. 1873.	January. Average.	February. 1873.	February. Average.	March. 1873.	March. Average.	April. 1873.	April. Average.	May. 1873.	May. Average.	June. 1873.	June. Average.	July. 1873.	July. Average.	August. 1873.	August. Average.	September. 1873.	September. Average.	October. 1873.	October. Average.	November. 1873.	November. Average.	December. 1873.	December. Average.	Total of 1873.	Total of Average.
Chittagong -	0·41	0·71	0·06	0·83	1·32	2·04	6·41	4·96	6·40	10·37	19·99	22·17	19·96	21·11	20·02	18·25	8·73	11·99	4·27	6·89	0·41	0·87	0·67	0·21	88·65	100·40
Dacca -	0·10	0·71	0·14	1·12	0·95	1·79	4·78	4·23	5·88	8·50	9·77	16·48	15·10	15·27	13·68	12·74	6·92	10·57	1·55	4·86	0·34	0·20	0·64	0·13	61·85	76·60
Cooch Behar	0·10	0·73	0·22	0·41	1·32	1·34	7·03	5·53	3·81	10·46	35·99	30·14	21·35	29·60	20·44	26·59	14·48	22·81	0·25	6·73	—	0·11	0·18	0·12	105·17	134·57
Rajshahye -	0·26	0·52	0·14	0·92	1·03	1·09	3·64	3·34	1·48	6·68	10·58	15·21	9·31	14·67	11·75	12·48	5·16	12·37	0·23	5·09	0·04	0·30	0·25	0·11	43·87	72·78
Presidency -	0·12	0·57	0·10	1·10	1·09	1·31	2·12	2·73	3·31	5·15	4·59	11·63	13·81	10·70	11·87	10·98	2·32	8·43	0·82	4·96	0·29	0·32	0·24	0·10	40·68	57·98
Burdwan -	0·06	0·56	0·01	1·30	1·52	1·42	2·00	2·16	3·56	4·14	4·41	10·00	16·97	11·47	11·83	11·65	5·48	8·62	0·69	5·29	0·17	0·33	0·51	0·17	47·21	57·11
Bhagulpore -	0·24	0·51	—	1·26	0·84	0·51	0·97	1·06	0·74	2·96	4·78	9·09	12·21	12·72	10·61	11·24	4·94	9·90	0·03	3·26	0·01	0·03	0·16	0·04	35·53	52·58
Orissa -	0·08	0·51	—	0·73	1·00	0·82	1·03	1·62	3·08	2·83	3·74	10·37	11·48	12·98	12·87	11·46	6·57	9·64	5·58	7·59	0·52	1·34	0·50	0·21	46·45	60·11
Chota Nagpore.	0·03	0·61	0·01	0·94	1·55	0·85	0·91	0·76	1·14	1·64	2·76	8·64	19·49	12·95	13·27	11·75	7·75	8·23	0·29	3·43	0·04	0·09	0·19	0·10	47·43	49·99
Patna -	0·31	0·63	0·03	0·45	1·42	0·46	0·30	0·54	0·52	1·45	3·56	7·71	15·54	12·12	9·64	10·73	2·24	8·57	0·01	2·34	0·01	0·02	0·12	0·09	33·70	45·11

CENTRAL PROVINCES.

Central Provinces.

Dr. Barter and Mr. Nicholls.

The watersheds are these,—

The Vindhyan.
The Nerbudda.
The Tapti.
The Satpura.
The Godavari.
The Mahanadi.

The "Vindhyan" comprises the north and south escarpments of the Vindhyan range; the Ganges receives the waters of the former, and the Nerbudda those of the latter; the districts of Saugor, Damoh, and the subdivision Murwara are in this area.

The "Nerbudda" embraces the valley of the Nerbudda situated between the Vindhyan and Satpura ranges; it includes the districts of Jubbulpore, Narsinghpur, Hoshangabad, and Nimar. The Nerbudda river receives the waters of this tract.

The "Tapti" lies to the west of the main spur of the Satpura range; and in the Central Provinces is confined to the subdivision of Burhanpur and a part of Betul; it is drained by the Tapti river.

The "Satpura" division comprises the high lands of the Central Provinces running from east to west; the districts are Mandla and Balaghat, Seoni, Chhindwara and Betul. The drainage of the northern slopes falls into the Nerbudda, that of the western reaches the sea by means of the Tapti, and that of the southern is carried by the Godavari into the Bay of Bengal.

The "Godavari" comprises the plain country south of the Satpuras; the districts from east to west are Bhandara and Chanda, Nagpur and Wardha; the Godavari river receives the drainage of this tract.

The "Mahanadi" division comprises the plains of Chhattisgarh and Sambalpur; this tract is drained by the Mahanadi.

These divisions indicate the rain-fall systems. Striking the most western portion of the provinces in the Tapti division, the monsoon currents are divided by the Satpura range into the northern and southern, local peculiarities of hill and forest increasing or diminishing the amount of rain-fall. The higher ranges of hills, as Pachmarhi or the Mahadeo group, and the more eastern or trap formation, as the Mohtoor range, receive the heaviest rain-falls, which reach about 80 inches; whilst Burhanpur receives the lowest, or on an average about 28. Passing eastwards the rain-fall increases: thus Khandwa receives about 35, Hoshangabad 47, Narsinghpur 55, Jubbulpore 60, and the Vindhyan districts about 55. Similarly the hill districts receive from 40 on the western border to 60 on the eastern. Passing onwards over the southern part of the provinces, the monsoon strikes the Wardha district first, where the fall is about 35 inches, Nagpur receives 40, Chanda 43, and Bhandara 50, the plains of Chhattisgarh receive between 40 and 50, and the most eastern district, Sambalpur, receives 55 inches; this district and part of Chhattisgarh receives a portion of its rain-fall from a north-easterly direction.

The south-west monsoon commences in June; occasionally within the first 10 days; at other times it is delayed until the third week; it continues until some time in September and occasionally until October.

The eastern districts receive also some rain from a north-easterly direction, but particular observation has not hitherto been directed to this question.

Rain-gauges are kept at head-quarters of districts and of tahsils; also at meteorological observatories, where the officials attached to the Courts and observatories respectively keep up the registers. The following table gives the results recorded for the past 10 years. Registers are also kept at dispensaries.

Average Rain-fall registered in the several Districts of the Central Provinces for 10 Years, from 1868–1877.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1868 - -	1·62	0·28	0·50	0·07	0·46	7·25	9·61	5·76	4·80	0·09	—	0·07	30·51
1869 - -	0·08	0·12	0·77	0·17	0·37	4·26	15·54	12·51	10·96	3·93	0·02	0·67	49·40
1870 - -	1·22	0·12	1·02	0·52	0·02	10·76	16·94	8·30	7·41	3·27	0·59	—	50·17
1871 - -	0·56	0·49	0·04	0·13	1·03	12·54	15·37	6·61	10·96	0·13	0·22	0·18	48·26
1872 - -	0·03	0·06	0·35	1·00	0·05	8·63	15·80	14·32	8·53	1·88	0·04	0·67	51·36
1873 - -	0·21	0·36	0·53	0·07	0·76	3·11	13·29	9·99	11·35	0·23	0·01	0·25	40·16
1874 - -	0·45	0·23	0·19	0·04	0·69	12·80	16·82	15·82	6·83	0·90	0·05	0·03	54·85
1875 - -	0·26	0·49	0·01	0·11	0·48	10·92	20·60	10·39	10·22	2·11	0·01	0·09	55·69
1876 - -	—	—	0·17	—	0·12	3·89	17·44	13·66	8·89	0·41	—	—	44·58
1877 - -	2·98	0·90	0·66	1·88	2·19	9·13	10·04	12·34	3·75	2·63	0·24	1·45	48·19
Mean - -	0·74	0·30	0·42	0·40	0·62	8·33	15·14	10·97	8·37	1·56	0·12	0·34	47·31

Dr. Barter and Mr. Nicholls.

In a report on the variation of rain-fall in tropical India, dated 18th of May 1877, by the Meteorological Reporter to the Government of India, the rain-fall for Nagpur and Jubbulpore for a series of years is given. Thus the average rain-fall for Nagpur for the years 1855–1876 inclusive was 39·85; the highest annual rain-fall was 57·75 inches in 1867, and the lowest was 25·49 in 1868. The average for Jubbulpore for the years 1845 to 1876 inclusive was 53·26; the highest being 86·93 in 1874, and the lowest 28·30 in 1868.

The Sanitary Commissioner's statistics show that the average fall for the provinces in 1868 was 30 inches; the Jubbulpore district received 28·3, Raipur 35·8, and Bilaspur 29·0, and in these districts there was a famine; but in Jubbulpore, if not in the other districts, there were predisposing causes; in other districts also, which received light falls, there was considerable distress,—thus in the Seoni district, which received 31·4, although there was not a wide-spread famine, there was widespread distress; but in this district, when times are hard, a large section of the community subsists on jungle produce, as berries, fruit, roots, &c., or eke out an existence with their aid; here then the effects of scarcity would not be so marked. The average rain-fall for the provinces during the months August, September, and October, for the 10 years ending 1867, and the fall during these months in 1868, is here given.

	Ten years.	1868.
August -	9·50	4·60
September -	6·40	1·70
October -	1·20	0·10

But the amount of rain absolutely required depends, to no small extent, on the nature of the fall. Should this occur in plumps or heavy falls, and, as a necessary consequence, run off the ground and be followed by long breaks, a larger rain-fall will be necessary; but should light constant showers occur with occasional or a few heavy downpours at the critical periods of transplanting and earing—and sufficient to fill tanks—in rice-growing districts, then a smaller quantity in the aggregate will be sufficient.

Again, the nature of the crops raised governs the minimum required; rice-growing lands demand a larger rain-fall than the heavy black soils where wheat, joár, &c. are grown; in the former, if fairly distributed, 35 to 40 inches may be regarded as the minimum; and in the latter 27 to 35, varying in different districts.

But an excessive or an unseasonable rain-fall may also do considerable damage and cause much distress; the unseasonable and, in some places, excessive rain of the past cold season has resulted in a general rust or blight of the wheat crop, a short linseed crop, and destruction of the gram crop and masur.

We consider the minimum for rice lands to be from 35 to 40 inches, varying in different districts, provided also that the distribution be fairly opportune.

For black cotton soils we consider that from 27 to 35 would be absolutely requisite, varying in different districts. But the distribution is not of such vital importance, provided that no considerable portion of this total amount comes in torrents so as to run off and not sink into the soil, and that at least three inches fall late in September. This is of especial importance for the sake of the rabi sowings.

As for the maximum, the black cotton soil could stand 50 inches in the monsoon, provided that there are intervals of sunshine to strengthen and give health to the plants, and to allow of weeding and the banking up of the earth around the roots of the joár and cotton plants, done by a small plough four or five times in the rains.

For rice lands, provided there are intervals of sunshine, too much rain is difficult to imagine, provided that it does not fall heavily after the middle of October. Kodo and kutki are generally sown on sandy soil and on sloping ground, and so can hardly be injured by excess of rain.

The black cotton soil, after a tolerably good monsoon, has produced fair crops without the aid of winter rain.

Rain not exceeding three or four inches, from the middle of December to the middle of January for the southern districts, extending to a fortnight later for the northern districts, will be of immense advantage, but rain in excess of this amount greatly increases the risk of blight. A long continuance of cloudy weather at this time is still more dangerous.

For the rice districts and tracts rain is absolutely necessary only during the monsoon. Probably the following distribution is necessary to produce fair crops in all these tracts,—Chhattisgarh, Sambalpur, the Bhandara rice country, including Balaghat and Chanda, and the north of Betul and Chhindwara, and the sandy soils of Saugor, Damoh, and Jubbulpore.

June, 2nd half -	3 inches	Sowing.
July, 1st half -	4 "	
July, 2nd half -	8 "	Transplanting.
August, 1st half	8 "	
August, 2nd half	4 "	Sunshine and showers.
September, 1st half	6 "	Earing period of early rice.
September, 2nd half	7 "	
October, 1st half	4 "	Earing of late rice.
	44 "	

The black* cotton soils require, to produce fair crops:—

June, 2nd half -	3 inches	Sowings.	
July, 1st half -	4 "		
July, 2nd half -	4 "		
August, 1st half	4 "	Showers and sunshine required for weeding operations.	
August, 2nd half	4 "		
September, 1st half	6 "		
September, 2nd half	7 "	Blossoming of cotton and joár.	
October, 1st half	2 "	Rabi sowing.	
December, 2nd half	1 "	Southern districts,	Earing of rabi crops.
January, 1st half	2 "		
January, 2nd half	2 "	Northern districts.	
	38 "	for southern districts.	
	39 "	for northern districts.	

These figures are intended to cover all districts. Some localities could do fairly well with something less.

The sowings and the maintenance of the crops, including the transplanting of the rice, depend on the south-west monsoon.

It is doubtful whether we have any other than the south-western monsoon. But the October showers called the "Hathi," or elephant showers, come from the east or south-east.

These rains are partial and uncertain, but are of great importance to strengthen the late rice and joár and cotton when in blossom, and to keep the rabi lands from hardening, and to reduce the temperature of the surface of the earth to fit it for the germinating of the seed. The winter showers generally come from the north-east, and strengthen the wheat and other crops at the critical time of earing or blossoming.

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* Nagpur division, except the Bhandara rice field; the west of Chhattisgarh; the Jubbulpore division, save the north of Saugor, of Damoh, and of Jubbulpore; and all the Nerbudda division, except the north of Betul and Chhindwara.

Chap. I. Qn. 1

BERAR.

Berar.

Mr. Dunlop.

The province of Berar, the area of which is 17,711 square miles, is geographically divided into three sections.

On the northern side is the Melghat forming a portion of the Satpura range of mountains. Its area is 1,649 square miles.

On the southern side is the Balaghat or up-land country, comprising the Ajunta ridge, and sloping down southwards from thence to the Hyderabad territory, and between these two ranges of hills lies the Pyanghat or low-land country, an extremely fertile valley running the entire length of the province from east to west, with a breadth of from 40 to 50 miles.

The Melghat is chiefly forest land; there is but little cultivation.

The Balaghat country includes the whole of the Wun and Basim districts, and the greater portion of the Buldana district.

The Pyanghat country includes the whole of the Amraoti and Akola districts, the Ellichpur district (except the Melghat), and one Taluka of the Buldana district.

Roughly speaking, the Balaghat and Pyanghat tracts are about equal in area, each comprising about 8,000 square miles.

The monsoon rains are heaviest in the Melghat, and lightest in the Pyanghat country, the average rain-fall at the head-quarter stations in these three divisions being as follows:—

		Inches.
Melghat		57·57
Balaghat	Wun	41·08
	Basim	38·66
	Buldana	29·06
	Average	36·26
Pyanghat	Amraoti	32·99
	Akola	28·98
	Ellichpur	28·06
	Average	30·03

Exclusive of the Melghat, the chief drainage of which is northwards into the Tapti river, the average annual rain-fall on the province in the past six years has been 33·88 inches.

The south-west monsoon commences about the second week in June, and continues until the end of September or beginning of October. In normal years we have showers from the east or north-east in December or January which are beneficial for the late crops, but it is on the south-west monsoon that we are really dependent for our rain-fall.

BOMBAY.

Bombay

Mr. Peil.

The rain-fall of the Bombay Presidency is derived from the south-west monsoon between June and October. From certain natural causes, the quantity of rain precipitated from this current varies greatly and regularly from north to south, being smallest in Sind and greatest in Canara. Thus the average fall from north to south is—

		Inches.
Sind		8·42
Katch		14·30
Kattywar		24
Guzerat		33
North Konkan		68
Bombay		73
S. Konkan	Colaba	108
	Vingorla	112
Kanara—Honawar		152

But the line of the Ghats, running parallel to the coast throughout the south of the Presidency from 50 to 30 miles from the sea, causes another variation. On the Ghats or Sahyadri range the average fall is 215 inches. The plain above them is a high plateau sloping from 2,000 feet above the sea at the Ghats to about 1,400 feet on the east frontier. This plateau may be divided into three parallel tracts—(1.) That immediately east of the Ghats, or West Deccan. The average fall in the West Deccan is 33 inches. (2.) The East Deccan. The average fall of the East Deccan is 23 inches. (3.) The tract between the East and West Deccan, which is drier than either, the rain-fall being 20 inches in the south of Kaladgi and east of Dharwar, and at Siroor (Poona), and Niphad (Nassick.) This is the district which requires protection from failure of the rain-fall. In the extreme East Deccan the fall is larger, owing to the recurve of the monsoon. Especially in September and October the rain-fall is larger in the East Deccan, and particularly in the south part of it, than in the Konkan or Guzerat.

Mr. Chamb

In order to obtain in tabular form a general and concise view of the rain-fall of the Presidency, I have selected the rain records of the following stations, and grouped them as shown below:—

(*a.*)

Sind.	Guzerat.	Konkan.	Sahyadri Range.	North Deccan.	South Deccan.	West Deecan.	East Deccan.
Kurrachee.	Surat.	Karwar.	Matheran.	Dhulia.	Satara.	Nasik.	Ahmednagar.
Sehwan.	Broach.	Honawar.	Mahableshwar.	Nasik.	Sholapur.	Malegaon.	Sholapur.
Tatta.	Kaira.	Vingorla.	Igatpuri.	Malegaon.	Kolhapur.	Poona.	Gokak.
Hyderabad.	Godhra.	Ratnagiri.		Ahmednagar.	Belgaum.	Satara.	Hubli.
Umerkot.	Ahmedabad.	Colaba Observatory.		Poona.	Gokak.	Kolhapur.	Nargund.
Nagan.	Boria.	Tanna.			Hubli.	Belgaum.	Kalghatgi.
Shikarpur.	Edar.				Nargund.		Bijapur.
Rohri.	Palanpur.				Kalghatgi.		
Jacobabad.	Rajkot.				Bijapur.		
	Deesa.						

The rain registers of the above stations are sufficient to show with tolerable accuracy the salient features of the rain-fall distribution of the Presidency. The normal monthly and annual rain-fall for each of these groups of stations is given below:—

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Bombay.

Mr. Chambers.

Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Year.
Sind - - -	0·37	0·23	0·27	0·10	0·14	0·60	2·78	2·82	0·72	0·12	0·12	0·15	8·42
Guzerat - - -	0·02	0·21	0·03	0·02	0·38	4·55	11·32	10·14	5·46	0·56	0· 5	0·05	32·89
Konkan - -	0·56	0·00	0·08	0·21	1·23	31·77	35·72	20·64	11·77	2·90	0·62	0·09	105·59
Sahyadri Range - -	0·28	0·01	0·23	0·46	0·78	38·23	83·09	59·83	26·75	4·59	0·50	0·13	214·88
North Deccan - -	0·42	0·05	0·10	0·34	0·76	5·18	4·72	4·29	4·38	2·92	0·66	0·24	24·06
South Deccan - -	0·15	0·02	0·26	1·00	1·71	5·52	6·68	4·88	3·35	4·24	0·59	0·75	29·15
West Deccan - -	0·25	0·03	0·15	0·91	1·36	6·94	9·43	6·15	3·86	3·74	0·84	0·30	33·96
East Deccan - -	0·20	0·03	0·28	0·75	1·56	4·27	3·39	3·57	3·71	4·11	0·44	0·86	23·17

In Guzerat, the Konkan, along the Sahyadri Range, and in the western portions of the Deccan bordering on the Sahyadri Range, the rain comes chiefly from the west and south-west, but it also falls in the monsoon months (June to September), during calms and in unsettled weather. In Sind and in the eastern portions of the Presidency rain seldom falls when the westerly monsoon wind blows with full force, but usually during the temporary cessations of the westerly wind and when the wind is from the eastward. The rain which falls on the Deccan in the month of October comes almost exclusively from the eastward.

With reference to "*the effect on the crops of the failure of any of these elements of rain-fall, and the combination of circumstances under which the worst results have been produced,*" I would point to the great per-centage deficiencies (given below in table (*e*)) of the rain-fall on the Deccan (particularly in the southern and eastern portions) in the three successive months (August, September, and October). The failure of crops on the Deccan in 1876 appears to have been chiefly due to this continued deficiency of rain.

The most important factor amongst the causes which determine a famine is probably a deficiency of the usual rain-fall. It is of this factor that I possess personal knowledge, and to which my remarks will therefore be confined.

Those portions of the country which have the smallest normal rain-fall will be most subject to famine, and those in which the normal rain-fall is heavy will be freest from it, not only because the rain-fall is usually small in amount in the former districts and large in the latter, but chiefly because the *per-centage variation* of the rain-fall in districts where the fall is normally small, is greater than in those where the fall is usually large.

Sind, the Thar, and portions of Rajputana are examples of regions in which food grains cannot be grown without irrigation, on account of the scantiness of the normal rain-fall; the Konkan and along the Sahyadri Range, of regions of normally heavy rain-fall, in which the fall of any individual year is rarely or perhaps never less than 50 per cent. of the normal quantity, and in which a total failure of the crops will very rarely or perhaps never happen. The remaining districts of the Presidency occupy positions intermediate between these two extremes, and it is in these districts mainly that a deficiency of rain is most severely felt.

The comparative greatness of the per-centage of the rain-fall in districts where the rain-fall is normally small may be illustrated by a consideration of the rain-fall distribution of the famine years 1876 and 1877.

A similar discussion of the per-centage rain-fall distribution of a large number of past years would doubtless be very informing, and would afford a broader basis on which to found any general conclusions, but this is a work requiring special provision for its accomplishment, and therefore at present impracticable.

The most convenient numerical form in which to study the rain-fall for practical purposes appears to be that of per-centages of the average fall. When put into this form the variations of the rain-fall may be taken as a comparative measure of their effects on the crops in different districts, an advantage which cannot be claimed for the numbers representing the absolute variations, for in a district where the average absolute fall is great a variation of a few inches more or less is of little consequence, whereas a variation of the same absolute amounts in districts where the fall is usually scanty might determine the success or failure of agricultural operations. The rain-fall of each district in the monsoon months (June to October), and the total for the year, is given in the per-centage form for the years 1876 and 1877, and in the two following tables:—

(*c.*) Per-centages of Normal Rain-fall in 1876.

Districts.	June.	July.	Aug.	Sept.	Oct.	Year.
Sind - -	8	173	114	57	—	112
Guzerat - -	31	107	100	117	—	92
Konkan - -	72	96	48	60	—	70
Sahyadri Range -	47	121	87	44	—	85
North Deccan -	87	102	79	25	5	59
South Deccan -	55	143	42	33	8	62
West Deccan -	63	141	64	29	11	71
East Deccan -	55	111	35	31	5	47

(*d.*) Per-centages of Normal Rain-fall in 1877.

Districts.	June.	July.	Aug.	Sept.	Oct.	Year.
Sind - -	18	8	—	290	117	54
Guzerat - -	60	30	8	99	612	53
Konkan - -	88	34	78	81	348	73
Sahyadri Range -	66	52	49	69	142	58
North Deccan -	124	39	97	85	88	88
South Deccan -	139	31	92	303	189	125
West Deccan -	128	29	74	165	137	83
East Deccan -	149	38	95	268	183	142

The figures given above show what per-centage of the normal fall of each month was received in each district; and the numbers given below show for the same years the *per-centage variation* (*i.e.*, excess or defect) from the normal quantity for each of the wet months of the year, which are June to October in the Deccan, and June to September elsewhere.

Mr. Chambers

(*e*.) PER-CENTAGE VARIATION of the RAIN-FALL of each DISTRICT in the YEARS 1876 and 1877.

Months.	Sind.	Guzerat.	Konkan.	Sahyadri Range.	West Deccan.	East Deccan.	North Deccan.	South Deccan.
1876.								
June	− 92	− 69	− 28	− 53	− 37	− 45	− 13	− 45
July	+ 73	+ 7	− 4	+ 21	+ 41	+ 11	+ 2	+ 43
August	+ 14	—	− 52	− 13	− 36	− 65	− 21	− 58
September	− 43	+ 17	− 40	− 56	− 71	− 69	− 75	− 67
October	—	—	—	—	− 89	− 95	− 96	− 92
1877.								
June	− 82	− 40	− 12	− 34	+ 28	+ 49	+ 24	+ 39
July	− 92	− 70	− 66	− 48	− 71	− 62	− 61	− 69
August	−100	− 92	− 22	− 51	− 26	− 5	− 3	− 8
September	+190	− 1	− 19	− 31	+ 65	−164	− 15	+203
October	—	—	—	—	+ 37	+ 83	− 12	+ 89
Sums	686	296	243	307	501	648	321	713
Means	85	37	30	38	50	64	32	71

The mean monthly per-centage variation for each district in the years 1876 and 1877 is obtained by taking the sum of the per-centage variations irrespective of signs, and dividing by the number of months. Arranging below these mean results in the order of the total annual rain-fall of each district, we find that the per-centage variation of the rain-fall is much greater in Sind and in the Deccan, where the normal rain-fall is small, than in the Konkan and Guzerat, where the normal fall is more considerable.

—	Sahyadri Range.	Konkan.	Guzerat.	Deccan, mean of East and West.	Sind.
Total normal annual fall in inches.	215	106	33	29	8
Monthly per-centage variation from normal.	38	30	37	57	85

This conclusion is the same as that given in my "Brief Sketch of the Meteorology of the Bombay Presidency in 1877," from which I quote the following passage:—

"Arranging below the per-centages of this month (July 1877), in the order of the absolute normal fall of each district, we find that there is a well-marked similarity of progression in the two sets of numbers:—

—		Sahyadri Range.	Konkan.	Guzerat.	West Deccan.	Sind.
July	Normal fall	83·09	35·72	11·32	9·43	2·78
	Per-centage fall in 1877.	52	34	30	29	8

"From these numbers it appears that when the rains directly dependent on the south-west monsoon current are deficient, the failure is most serious in those districts where the normal rain-fall due to this particular current is least, and that the failure does not affect in the same proportion those regions where the rain-fall is heavy. This is what might be expected from theoretical considerations, and the conclusion has an important bearing on any protective measures against the effects of famine that may be in contemplation for the benefit of these districts, for it shows very clearly that those regions which are subject to the greatest per-centage variations of their rain-fall are identical with those in which the rain-fall is normally scanty, and that, comparatively speaking, those in which the normal rain-fall is heavy may be left to take care of themselves, since the per-centage variations of rain-fall in those districts are comparatively small."

Mr. Peile.

The following is a summary of the answers to the latter half of question 1, the districts being taken in their order from north to south.

Kutch.—(Average fall 14·30 inches.) A fall of 10 inches would suffice well distributed, thus—

July	5 inches.
August	1 "
September	4 "

Kathiawar.—(Average fall 24 inches.) A fall of 20 inches is necessary for a good crop. In June 6 inches are required for sowing cotton, millet, *til*, and inferior grain. Sowing goes on to July 1. In July 5 inches, and in August 4 inches are wanted to develop the crops; in September 4 inches. For sowing the cold weather crops in October a fall of 5 inches is desired. These are wheat and rice. The failure of the July and August rain causes the early crops to wither. Failure of the October rains endangers the wheat and rice.

Kaira.—All depends on the way the rain-fall is distributed. The following falls would give full crops:—

June	5 inches.
July	10 "
August	7 "
September	6 "
October	2 "
Total	30 "

Surat.—No serious damage if the rain-fall is not less than half the average (average 42 inches).

Khandesh.—15 inches of rain falling advantageously, better than 30 inches badly distributed. After the first burst of 4 or 5 inches, a fall of 4 inches per month for four or five months sufficient. A combination of scanty rain and excessive heat produces the worst results.

Nasik.—A fall of 25 inches, if seasonable, is sufficient. Heavy rain coming when not wanted often does harm. Rain is required before sowing in June, after that a few falls at intervals, and good rain in September to enable the crops to ripen. Rabi crops are sown after the October rain, and require showers in December.

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BOMBAY.

Mr. Peile.

Poona.—The early crops are sown after the first fall of rain from the beginning of June to the end of July. A second fall is required in August to mature the crops. Further rain is necessary in September. Showers in October, November, and December are of great benefit to the rabi crops. If the rain falls seasonably, a small quantity only is required, about 15 inches being sufficient, well distributed.

Ahmednagar.—The monsoon season may be divided into the periods (1) from June 10th to August 15th, and (2) from September 1st to October 15th. A fall of 15 inches between June and October would give good crops if the rain fell favourably. This happened in 1873–74 in the Kopergám taluka. A fall of 30 inches would not cause damage. The kharif crop is principally bajra, sown in June or July, reaped in November or December. The rabi crop is wheat, jowári, and gram, sown in September, and reaped in February or March. Near the Western Ghats (Akola taluka) rice and nagli are also grown.

Sholapur.—The crops depend more on the time at which the rain falls than on the quantity. Kharif crops (quarter of the whole) are sown in June or July, as the rain falls; rabi crops in September and October.

now Bijapur

Kaladgi.—The Collector says the district is dependent on the monsoon for its rain-fall, and chiefly so on the south-west monsoon. The rain generally falls at intervals between May and October. A little often falls in April, but that is only useful as replenishing the water supply.

The average amount gauged in each of the months when the rain is useful for agriculture is as follows:—

	Inches.	Cents.
May - - -	1	67
June - - -	3	91
July - -	1	49
August - - -	3	23
September - - -	7	1
October - - -	4	4

The average fall for the year being 22 inches 64 cents. It is difficult to give any limit within which the rain-fall may vary without doing serious injury. The actual amount gauged is scarcely a criterion, because a heavy fall of a few hours may gauge much, but be of little good if it ceases entirely, whereas a gentle but continuous rain, which does not gauge much, may be most beneficial. For instance, the rain-fall in June 1876 (6 inches 83 cents) is the highest recorded in the 10 years, but yet that was the great year of famine. The rain in September 1877 (12 inches 3 cents) did infinite damage from its heaviness, whereas I cannot learn that that of September 1874 (22 inches 6 cents) did. Again, the fall of 1876 (13 inches 40 cents) resulted in severe famine, whereas the fall of 1871 (13 inches 92 cents) did not cause any bad effects. In that latter year the rain may be said to have fallen seasonably though scantily, and I would take the aggregate and monthly fall during it as a criterion of what is sufficient.

I believe from what I hear, and judging from the present year, the rain-fall may almost entirely fail in June and to the middle of July without causing serious injury, provided the rain falls seasonably afterwards.

Up to the middle of August the sowing of the kharif crops is dependent on the rain-fall, and from that time till the end of October the sowing of the rabi crops is so dependent.

If the rain fails, the crops either cannot be sown or get withered up. During 1876 the rain so fell that it was of benefit to neither crop, so that famine resulted.

Satara.—The Collector says the regular rain-fall takes place from about the 20th June till the 30th September. This is the westerly monsoon, on which the greater part of the district depends. It does not as a rule penetrate more than 20 miles east of Satara. The eastern part of the district depends upon storms at irregular intervals, from the 15th May to the 15th June. Some easterly rain occasionally falls about Christmas and in March or April. I consider that a fall of 32 inches, if favourably distributed, is sufficient for the district, but we cannot well do with less. The variation, therefore, should be between 32 inches and 53 inches. We require rain from May 15th to January. The minimum fall, if favourably distributed, would be—

May - - - -	3	inches.
June - - -	9	„
July - - -	5	„
August - - -	5	„
September - - -	5	„
October - - -	4	„
November - - -	–	„
December - - -	1	„
January - - -		
Total - - -	32	„

The May rain is required to prepare the fields and to cause the grass to begin to spring, so as to be ready to receive the westerly monsoon in June. About 5 of the 9 inches in June should fall between the 5th and the 20th of that month, so as to enable the cultivators to complete the preparation of their fields and to sow bajra in the east, early jowári and pulses in the centre, and rice and nachni in the extreme west of the district. The remaining 4 inches will cause the seed to germinate, and the crops to grow. The 5 inches in July should fall about the middle of the month, to enable bajra to be sown in the centre of the district. The rain in August and September is necessary for the proper growth of the crops, and if an inch or two falls at the end of September, with 4 inches at the beginning of October, the rabi crop can be sown, and will flourish, but it needs an inch in December or January, about Christmas or New Year's day, to help it on. If rain does not fall in May or June, the grass crop will probably fail in the centre and west of the district, and rice will probably not be sown. If rain falls early in June, and if there is a long break, the rice and nachni will wither. If rain does not fall in June or July, the kharif crop will not be sown. I give up to the 20th July for sowing kharif. If good rain falls in June and none in July or August, the kharif will be lost. If seasonable rain falls at the end of September and the beginning of October, the rabi crop will thrive. If none falls in September and October, but early in November, the rabi crop will not be so good; if no rain falls in September, October, or November, the rabi crop will fail. The worst results in this district have been produced by the failure of easterly rain, and a scanty fall from the west in June and July.

Dharwar.—Mr. Charles says the normal system of rain-fall in Dharwar may be divided into three periods. The first is from the middle of April till the end of the first week in June. During this period there should be heavy thunderstorms about every 10 or 15 days, with falls of from half to 2 inches, generally from the east. These falls are necessary for the rice fields all along the western side of the district, to enable the rice to be sown before the end of May. East of Hubli these rains are of no particular use, as in the black soil there is no rice, and no crops are sown before the end of June or beginning of July.

The next period is that of the S.W. monsoon, and lasts from the middle of June till the middle or end of September. The monsoon should begin with about a week of heavy rain, that is to say, heavy showers lasting some hours every day, to moisten thoroughly all the land intended for early jowári and nachni. After a week's rain, there should be a week of nearly fair weather, to enable fieldwork to go on, and early sowings of jowári should begin in the beginning of July.

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Bombay.

Mr. Peile.

The whole of July should be wet, with but few entirely dry days. August is generally a dry month, in average years the rain-fall being from 2 to 3 inches only. September should be moderately wet, with many fine days.

October is the month that exercises most influence on the harvest, and unfortunately it is also the month which has the most uncertain rain-fall. If there be no rain-fall at all, as was the case in 1876, the cotton, later jowâri, and wheat crops are entirely lost, as happened in 1877.

If it be unprecedentedly heavy, as in 1877, the early jowari is injured and the ears sprout, as was seen in November 1877.

The October rain comes entirely from the east, and is not of the nature of steady rain, but comes in sudden and very heavy downpours, lasting an hour or two.

The total rain-fall in October should be about 6 inches, from half an inch to 2 inches falling in one heavy plump every few days. This gives all the moisture necessary for the cotton and wheat and later jowâri crops, and after October the less rain that falls the better both for the harvesting of the early jowâri crop and for the cotton and wheat and rabi crops generally. But few seasons pass without a few days of rain, often heavy, in December and January, and any excess causes mildew in the wheat. This refers to the east of the district only, as the rice and early jowâri are cut in November and the beginning of December, and rain in January matters little in these parts.

Ratnagiri.—The Collector says we are dependent on the south-west monsoon, which comes about the 5th of June, and continues, with breaks, up to 15th October.

The rain-fall is gauged at every one of the 12 Taluka and Mahal head-quarters, and also at the civil hospitals at Ratnagiri, Vingorla, and Dapoli. The average rain-fall in the past 20 years has been as follows:—

	Inches.	Cents.
In June - - -	29	49
„ July - - -	32	57
„ August - -	18	2
„ September - -	12	33
„ October - -	2	59

The average fall in the year is 97 inches 62 cents; this would be a fair and sufficient amount. A smart fall for about 10 days is required with the burst of the monsoon, to enable the people to sow their seedling patches of rice and plough up their other lands, ready for soakage before transplantation. A break with light showers for a fortnight would then be serviceable.

In July there should be very heavy rain and storms. In fact there can then hardly be too much rain. During that month the ryot will be first soaking (by swamping) his lands, and will then be occupied in transplanting.

Heavy and steady rain with intervals of sunshine should follow throughout August, when the ryot will be weeding his fields.

Lighter rain and more sun should follow in September. At the end of September a few heavy falls will be seasonable. Early in October the "halway" or early crops on the uplands will be ready to cut.

About the middle of October heavy rain for some days will be seasonable, and conduce greatly to a good "warkas" or hill-crop season.

A late monsoon, therefore, results in a diminished area of cultivation, because the ryot has too short an interval between the first fall and the very heavy rains of July, and in a lighter crop, because the seedlings have not grown sufficiently strong for transplanting when the heavy rains come.

A drought in September and October necessarily results in the drying up and withering of the hill crops.

A combination of a late monsoon, therefore, with drought in September and October, brings ruin to the crops of the Konkan, especially to the hill crops.

Canara.—For rice crops on the coast the rain-fall should not exceed 120 inches or be less than 85 inches. In the latter case the fall should be spread through four months. Above Ghâts the fall may be as low as 30 inches. Rice land and the areca nut, cardamom, pepper, and cocoanut gardens are prepared and sown in May. The monsoon is expected by June 5th. Rice transplanting takes place in June and July. A second crop of rice is sown in December in the moistest lands. A deficiency of rain in June or July defers sowing, in August parches the crops, in September diminishes the out-turn. A total failure in June and July would produce the worst results.

Thana.—When the monsoon begins in June or July, the ground is ploughed and the rice seed sown in nurseries previously prepared with ash manure. A copious fall of rain in July is needed to prepare the fields to have the rice transplanted into them. After this sunshine and light showers for three weeks, and then a good fall is needed to fill the grain. Dry weather is required in October and November, when the crops are cut. Failure of timely rain injures the crop, but no disaster worse than a partial failure from scanty rain is recorded.

Colaba.—Rice is the staple crop. A seasonable rain-fall would be—June, 20 inches; July, 20 inches; August, 30 inches; September, 15 inches; October, 5 inches. Failure of rain when the rice is sown and transplanted is fatal to the crops.

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Sindh lies just outside the regular track of the south-west monsoon. Its rain-fall is therefore fluctuating, and as a rule scanty. The average annual fall is about 7 inches. The minimum may be put at 2½ inches; the greatest fall recorded since 1856 has been 28·45 inches. Excluding the rare years in which the fall is excessive, the average is about 5 inches. (Sindh Gazetteer, from observations of Kurrachee Meteorological Observatory.) The following are the monthly averages as recorded at five principal stations representing northern, central, eastern, and southern Sind.

Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Shikarpur - -	·34	·29	·51	—	·64	·20	·95	2·49	·30	—	—	·13
Sehwan - - -	·31	·10	·14	·3	·16	—	1·31	3·30	·87	—	—	·18
Umarkote - -	·7	·14	—	—	·11	·20	3·97	2·30	·2	—	—	·8
Hyderabad - -	·30	·29	·12	·5	·1	·57	3·13	1·69	·85	—	·8	·2
Kurrachee - -	·67	·3	—	—	·01	·30	4·08	·54	·34	—	—	·15
Average for province -	·34	·17	·15	·16	·18	·25	2·69	2·6	·47	—	·16	·11

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2. In regard to its agriculture, Sind may be said to be almost independent of rain, and the scanty average rain-fall above shown would, if rain were more regular, ensure abundant harvests. Unfortunately the fall is very fluctuating. In many years there is hardly any; in some years there is greatly too much. August is the only month in which there is, as a rule, no failure. A perfect rain-fall would be about as follows—

		Inches.
Kharif	June	·50 (beginning about 20th).
	July	2·50
	August	3·00
	September	·50 (not after 10th).
		Inches.
Rabi	December	[illegible] (beginning about 25th).
	January	[illegible]
	February	·40 (not after 25th).

Thus, a rainfall of 7·70 inches, if not fluctuating, is about the best quantity that can be had in aid of irrigation.

3. Failure of rain is more serious in the rabi than in the kharif season. In the latter it results in some deficiency, both in quality and quantity of the crop; but in the rabi the crops grown (especially wheat, the most valuable of all) on land flooded during the inundation are liable to nearly total failure if no rain falls during the cold season.

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For the purpose of illustrating the system of rain-fall of the Presidency, the year may be conveniently divided into two equal periods, viz., from the 1st October to the 31st March, and from the 1st April to the 30th September, the bulk of the rain-fall in these periods being due to the south-west and north-east monsoon respectively.

2. The south-west monsoon commences to blow in the end of May or beginning of June, and a great portion of the vapour brought with it from the Indian ocean is intercepted and condensed by the Western Ghâts and precipitated in torrents of rain on the strip of land between these mountains and the sea, which forms the district of Malabar and Canara, and the kingdoms of Travancore and Cochin. A portion, however, passes over the range, or through the gaps which here and there occur, and finds its way in more or less abundance to every district in the Presidency. Excluding the minor showers of April, which are not due to the influence of either monsoon, the average rain-fall of the six years ending 1875–76 during the south-west monsoon for each district is noted below.* It will be observed that according to this average the rain-fall is less in Malabar than in Canara, and the returns from the Trevandrum Observatory show that the fall in that State is considerably less than in Malabar. The same phenomenon occurs with what blows over the Western Ghâts, the fall in the Northern Districts of Ganjam and Vizagapatam being almost one fourth of that in Canara, while in the district of Tinnevelly to the extreme south of the Presidency the average amount registered is no more than 4·14 inches. Subject to this same rule of a greater fall in the more northerly districts, the amount of rain precipitated to the east of the Western Ghâts seems to vary directly with the distance the vapour has to be carried overland, the fall in the more inland districts being almost invariably less than in the districts nearer the coast in the line of the wind, the only exceptions to both rules being the district of Nellore and, in a much less degree, the adjoining district of Kistna, where the fall is less than in several other districts both further south and further inland.

3. The north-east monsoon blows from the Bay of Bengal, commencing about the middle of October and ending in December. The statement below* shows the average rain-fall in each district between the 1st October and the 31st December. The amount which falls is much less than that during the south-west monsoon, and its distribution seems to be governed by more complex laws.

4. Very little rain falls in the early months of the year, but before the burst of the south-west monsoon there are occasionally a few showers popularly known as "the mango showers," the average quantity of which is as shown below:—

	Inches.
Tinnevelly	5·86
Malabar	5·44
Tanjore	4·33
Madura	4·18
Coimbatore	3·20
South Arcot	2·77
Trichinopoly	2·82
Chingleput	2·61
Salem	2·35
South Canara	2·35
Madras	2·22
North Arcot	2·13
Ganjam	1·99
Vizagapatam	1·48
Nellore	1·24
Kistna	1·07
Godavari	1·02
Bellary	0·75
Cuddapah	0·73
Kurnool	0·47

The total average rain-fall in each district ranges thus:—

	Inches.
South Canara	143·60
Malabar	114·95

	Inches.
*South Canara	130·80
Malabar	97·07
Ganjam	30·27
Vizagapatam	26·02
Godavari	25·89
Kurnool	23·22
North Arcot	23·23
Salem	21·78
South Arcot	21·08
Kistna	21·08
Chingleput	20·97
Madras	20·76
Cuddapah	19·14
Bellary	17·68
Tanjore	16·00
Trichinopoly	15·14
Nellore	14·19
Coimbatore	11·54
Madura	7·96
Tinnevelly	4·14

	Inches.
*Madras	34·98
Chingleput	24·64
Tanjore	23·16
Nellore	21·04
South Arcot	20·92
Trichinopoly	16·98
North Arcot	14·98
Vizagapatam	13·15
Malabar	12·44
Godavari	12·37
Tinnevelly	12·85
Ganjam	11·77
Madura	11·59
Salem	11·17
Cuddapah	11·10
South Canara	10·45
Kistna	10·43
Coimbatore	10·07
Bellary	7·34
Kurnool	6·32

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	Inches.
Madras - - -	57·96
Chingleput - - -	48·22
South Arcot - -	44·77
Ganjam - - -	44·03
Tanjore - - -	43·49
Vizagapatam - -	40·65
North Arcot - -	40·34
Godavari - - -	39·28
Nellore - - -	36·47
Salem - - -	35·30
Trichinopoly - -	34·94
Kistna - - -	32·58
Cuddapah - -	30·97
Kurnool - - -	30·01
Coimbatore - -	24·81
Bellary - - -	25·77
Madura - - -	23·73
Tinnevelly - - -	22·85

It is to be noted that the rain-fall given above is merely the average for a district, and that it not unfrequently happens that the rain-fall in one part of a district varies as widely from that in another part of the same district as it does from that in stations in other districts, if not more so.

The following statement shows the proportion of the Ryotwar area cultivated under each of the monsoons in Fasli 1284, which was a favourable year. The figures, however, cannot be said to be absolutely correct, as the village accountants often enter the cultivation of one month in the month following; but they are sufficiently near the mark to furnish a rough idea of the extent to which the country is indebted to each of the monsoons. It must, however, be borne in mind that most of the crops, the cultivation of which is commenced under the south-west monsoon, are matured during the north-east monsoon.

Districts.	From April to September.			From October to March.		
	Dry.	Wet.	Total.	Dry.	Wet.	Total.
Ganjam - -	90	93	92	10	7	8
Vizagapatam -	82	83	83	18	17	17
Godavari - -	76	96	87	24	4	13
Kistna - -	51	70	53	49	30	47
Nellore - -	32	49	36	68	51	64
Cuddapah -	57	69	57	43	31	43
Bellary - -	68	63	67	32	37	33
Kurnool - -	65	80	65	35	20	35
Chingleput -	37	34	35	63	66	65
North Arcot -	73	69	72	27	31	28
South Arcot -	71	61	68	29	39	32
Tanjore - -	51	61	59	49	39	41
Trichinopoly -	57	62	58	43	38	42
Madura - -	50	38	48	50	62	52
Tinnevelly -	9	35	15	91	65	85
Coimbatore -	57	60	57	43	40	43
Nilgiris - -	65	100	65	35	—	35
Salem - -	81	75	80	19	25	20

N.B.—In Madras cultivation is trifling and not recorded, and for Malabar and South Canara monthly cultivation figures are not available.

A statement showing the average rain-fall of six years in each district in each month is annexed :—

STATEMENT of RAIN-FALL in each DISTRICT and for each MONTH on the AVERAGE of the SIX YEARS from 1870–71 to 1875–76 (inclusive).

Districts.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total of the whole Period.
	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Ganjam - -	6·25	6·27	6·73	9·09	9·74	1·49	0·54	0·22	0·11	0·52	1·14	1·91	44·03
Vizagapatam - -	4·60	5·33	5·97	8·01	10·68	1·55	0·92	0·09	0·28	0·30	0·81	2·11	40·65
Godavari - -	4·08	6·24	4·98	8·58	10·48	1·51	0·38	0·11	0·18	0·34	0·39	2·01	39·28
Kistna - - -	2·99	4·85	5·00	6·77	8·54	1·61	0·28	0·47	0·05	0·34	0·21	1·47	32·58
Nellore - -	1·43	3·04	3·45	4·82	11·07	7·65	2·32	0·35	0·57	0·19	0·13	1·45	36·47
Cuddapah - -	2·44	2·99	4·09	7·00	7·97	2·44	0·69	0·13	0·15	0·22	0·23	2·62	30·97
Bellary - -	2·96	2·69	3·49	5·91	6·41	0·71	0·22	0·06	0·01	0·14	0·54	2·63	25·77
Kurnool - -	3·29	5·32	4·19	8·37	5·24	0·74	0·34	0·04	0·00	0·14	0·29	2·05	30·01
Madras - -	3·17	4·58	4·84	6·08	14·34	16·27	4·37	0·10	1·10	0·39	0·63	2·09	57·96
Chingleput - -	2·72	3·94	5·32	6·17	9·66	12·14	2·84	0·26	1·69	0·21	0·45	2·82	48·22
North Arcot - -	2·53	3·46	5·26	7·51	7·83	5·81	1·34	0·28	1·03	0·50	0·32	4·47	40·34
South Arcot - -	1·79	3·16	6·27	6·51	8·19	9·62	3·11	0·25	1·35	0·20	0·97	3·35	44·77
Tanjore - -	1·88	2·43	4·60	4·34	8·28	10·21	4·67	0·71	1·50	0·25	1·87	2·75	43·49
Trichinopoly - -	2·01	1·88	4·49	4·32	8·34	6·50	2·14	0·35	0·95	0·10	1·42	2·44	34·94
Madura - -	1·30	0·86	2·36	1·83	5·12	5·03	1·44	0·56	1·03	0·60	1·99	1·61	23·73
Tinnevelly - -	0·73	0·34	0·71	1·05	3·56	7·42	1·87	1·59	1·53	1·08	1·66	1·31	22·85
Coimbatore - -	2·07	1·66	2·19	2·69	5·56	3·95	0·56	0·15	0·56	0·52	1·97	2·93	24·81
Salem - - -	2·40	2·70	4·77	6·63	7·22	2·89	1·06	0·07	0·40	0·62	1·26	5·28	35·30
South Canara -	38·09	47·57	22·08	14·56	8·55	1·63	0·27	0·82	0·18	0·26	1·09	8·50	143·60
Malabar - -	35·42	32·17	11·44	8·51	8·49	3·18	0·77	0·56	0·61	0·61	3·66	9·53	114·95

The average given in the statement is taken on the results of the six years ending 1875–76, and is, in the opinion of the Board, a fair approximation to the normal rain-fall so far as there can be said to be any "normal" rain-fall when the variations in the average of a district in six ordinary years are as great as are detailed below :—

District.	Maximum.	Minimum.
	In.	In.
Ganjam - - - - -	60·44	30·67
Vizagapatam - - - -	54·32	26·30
Godavari - - - -	47·35	26·91
Kistna - - - - -	36·63	26·37
Nellore - - - - -	44·36	28·97
Cuddapah - - - -	50·89	21·77
Bellary - - - -	39·19	19·63
Chingleput - - - -	76·01	29·39
North Arcot - - - -	55·93	25·80
South Arcot - - - -	63·81	33·42
Tanjore - - - -	57·06	30·27
Trichinopoly - - - -	46·26	24·35
Madura - - - -	29·73	15·61
Tinnevelly - - - -	27·93	19·33
Coimbatore - - - -	27·78	22·77
Salem - - - - -	42·98	27·71
South Canara - - -	183·87	114·42
Malabar - - - -	138·41	97·75
Kurnool - - - -	49·74	22·97

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The Board have not calculated the average on the results of a larger number of years, as correct figures are not available for years previous to 1870–71 as will be seen hereafter, and 1876–77 was altogether an exceptional year, the like of which, it is to be hoped, may not recur for a very long time.

As the quantity of rainfall required for agricultural operations depends upon various circumstances, such as the kind of crop raised, the nature of the soil and situation, and other considerations, the board requested the Collectors to consult the local experience of agriculturists, and to forward two statements showing for the principal crops in each district, (1) the maximum amount of rain they can bear each month without being injured, and (2) the minimum quantity they require to yield an average crop. The statements received have been tabulated, but it is evident that the information given is not very trustworthy. Many Collectors themselves state that the information furnished by them is not accurate, and in other cases there is abundant internal evidence to the same effect.

There can be no doubt that the experience of ages has taught the ryot to adapt his cultivation to the periods of rain-fall, by so timing his operations that his crop may arrive at particular stages of growth at periods of the year when the rain that is usually expected will benefit instead of injuring it. In those districts in which the mango showers fall with any degree of regularity, cultivation begins as early as April when the season is favourable. The light rains that fall enable the ryots to plough the ground and prepare it for receiving the seed. The seed is sown in the month of May, when moderate showers fall before the regular burst of the south-west monsoon. Where the mango showers cannot be depended upon, and even in other districts when it has been ascertained that the usual mango showers have failed, ploughing and preparing the ground is as late as the end of May or the beginning of June, and seed is sown before the end of the latter month, by which time the south-west monsoon has fairly burst in all the districts. In the tracts irrigated by the river systems fed by the rains of the south-west monsoon, such as the Godavari, the Kistna, and the Cauvery, the sowing takes place a little earlier, as the river freshes supply the required moisture before the south-west rains set in on the east coast. Paddy crop is from four to six months on the ground (one variety even less), and the dry crops generally between three and four months. The first crop of paddy (kar) and the dry crops generally take four months, and are reaped by the end of October before the north-east monsoon sets in. But the most extensively cultivated variety of paddy is samba, which is reaped in six months, and requires the rains of the north-east monsoon to bring it to maturity. After the first crop is reaped, if there is sufficient water, a second is sown and gathered about February or March. On dry lands also a second crop is sometimes raised of cholum, cumbu, ragi, or varagu, if the first harvest is over by October; if later, gram, oil seeds and pulses are sown in December and January, and matured by the moisture left by the north-east monsoon rains and the heavy dew which then falls. On the west coast the cultivation of cereals may be said to be almost confined to the growth of paddy. The first and the most important crop, called yenel in South Canara and kanni in Malabar, is reaped by September. The second crop is put in in November and reaped in January, and depends upon rivers, channels, and springs, assisted by the north-east rains. If there is sufficient water in the rivers and private tanks, a third crop is put in the ground in February and reaped in May.

It is to be borne in mind that the above is a very general description of cultivation, and that the times of reaping and sowing differ from place to place, according to local peculiarities and the kinds of crops raised. It will be seen that rain is essential at the sowing time, viz., in June and July, for otherwise the cultivation cannot be commenced. If the rain holds off till August, the cultivation under the south-west monsoon will, perhaps, be given up. If it is undertaken, it may suffer from the heavy rain of the north-east monsoon; and on the other hand, if the north-east monsoon fails, the crop must inevitably perish. Of the wet crops, "samba" paddy begins to ear in 4½ months, and "kar" at the close of the third month. Continued drought at this period will be most injurious, and the injury cannot be repaired by any subsequent rain-fall. The following extract from the report of Mr. Price, the Collector of Chingleput, puts this matter in a clear light:—

"There are two periods which are critical in regard to crops; first, when the flower is about to appear; second, when the ears are filling. An excess of rain or the reverse for a fortnight or three weeks decides what the fate of the crop will be. Subsequent rain-fall or fine weather may mitigate matters, but will not finally remedy them. Thus, as regards the early rice crop, if there is heavy rain at the end of June and into the middle of July, it would do harm; if it went on to the end of July and well into August, it would do still more; but if the rain held off during the latter part of July and it was fine in August, the flower which ought not to have had rain on it in June and July would, to a considerable extent, recover. So if when the ears began to fill towards the middle of July there was a want of rain, which would cause a good deal of the young ears to become chaff, and copious rain came at the end of the month, a good deal of the grain would recover. Generally speaking, it may be said that where there is either heavy rain or want of it for about three weeks beyond the period at which it should usually fall, or the reverse, and then that the season rights itself, no very material damage occurs; but if this time has elapsed, marked and permanent injury is occasioned. In the case of ragi, heavy rain will damage it when coming into ear, and when ripening; fine weather within three weeks in the first instance, and within ten days or a fortnight in the second, will put matters right. In the first instance the ears do not fill; in the second the grain apparently germinates whilst on the stem.

"The cumbu crop is much more delicate than either rice or ragi. If there is heavy rain at the time of its coming into flower, nothing will save the crop. On the other hand, if there is any dry weather near to the time that the first flower shoots should appear, and copious rain comes, the cumbu recovers in a marvellous way. Heavy rain again after the grain has formed causes injury by inducing a kind of spurious germination; fine weather within a fornight or three weeks will check this, but if there is too much dry weather after the heads are formed, no subsequent falls of rain will recover the crop. It may, however, induce the throwing out of young shoots, and the production of a light crop."

The quantity of rain-fall required for growth, as already stated, depends upon a variety of circumstances, such as soil, temperature, situation of the land, state of the atmosphere, and prevalence of winds, so that any general description must necessarily be no more than a rough approximation. Some crops can stand drought better and longer than others, and the quantity of rain required for certain crops and soils is much greater than that required for others. In slopes the moisture soon drains off, and a heavier rain-fall is necessary for the growth of crops there than elsewhere. Some soils, on the other hand, such as the black cotton soils of Bellary, are very retentive of moisture, and any large amount of rain will do injury. Rice crops can stand almost any amount of rain without being seriously injured, provided the plant is not wholly submerged in water. Varagu is a most hardy crop, can withstand drought long, and revive to a great extent if rain falls before it has actually perished. Gram, gingelly, &c., are very delicate, and will be injured even by comparatively moderate rains. The following remarks of Mr. Martin, the sub-collector of Madura, in regard to the effect of rain-fall on different crops will be found interesting:

"*Paddy.*—Excessive rain-fall will not injure this crop throughout its growth, except by breeding insects in, and knocking the grain out of, the ear. Scanty rain-fall will not repair damage under the circumstances. Deficient rain-fall will principally operate by affecting the sources of irrigation, so that field after field is deprived of its water. As it is known that paddy after being totally deprived of moisture for twenty days perishes, those fields only will be revived by copious rain-fall which have not been deprived of their supply for that length of time. The out-turn on fields so revived will vary by the length of time for which the field is dry; if for seven days it will be 40 per cent. below the average; for fourteen days 70 per cent.

"Copious rain after a failure can be remedied with paddy to a certain extent, because a variety of the plant can be sown on the withered fields the moment the tank, &c. receives a supply, and the crop may possibly only be retarded by the length of time that elapsed from the former sowing to withering, and this time may be shortened by choosing a crop that comes to harvest in a shorter time.

"*White Cholum.*—Excessive rain injures the stalk, turns it in the first month pale, and in later months red or dark brown with the final effect of disease in the ear affecting the size and consequent weight of the grain and its quality. The paleness in the first month will be quite remedied, and the crop restored by a month of scanty rain-fall. The redness in the older stage will be checked in extending, but plants already attacked will not be restored. The ear once having been formed in a deteriorated state will not be improved by scanty rain-fall. Cholum is a hardy crop, and will stand a deal of drought, springing almost as vigorously as ever from the old roots if it gets a copious rain-fall while in its first month. If it once dries up and looks scorched when the stalk is well formed it will give a bad return even though it gets copious rain.

"Varagu, ragi, and samai are very hardy plants, and will get on with very little moisture for nearly two months at first, and thrive luxuriantly afterwards under copious rain. Varagu and ragi stand a great deal of rain well, and are almost independent of a change into a light rain-fall. Samai will thrive under very heavy rain up to near harvest, when heavy rain will be fatal to it on account of the slight hold the grain has on the ear. Samai suffers from deficient rain-fall when it is well advanced.

"Cumbu follows cholum very nearly in its power to resist heavy rain or to be injured by deficiency. It is supposed to be able to do with less moisture, and at the same time to be less affected by excessive rain than cholum.

"Dhâl follows very much the same seasons as cholum, but it is less likely to suffer at any part of its growth if subject to scanty rain-fall. If when young it will always retain sufficient life to be made very luxuriant by a copious fall; the effect of deficiency on the advanced plants is both in the number of pods and size of the pulse, and this will not be remedied by copious rain after they have formed. Excessive rain long continued has a tendency to produce animal life to a very destructive extent in this crop, and subsequent scanty rain-fall will not remedy it.

"Horse-gram suffering from deficient rain-fall will rally very much under a copious fall and *vice versâ*, provided the creeping tendrils are nipped off and the plants prevented running into leaf."

The following extracts from the replies of the Collectors of Vizagapatam, Kurnool, Coimbatore, Tanjore, South Canara, and Malabar, and the sub-collector of Madura, who appear to have given a good deal of attention to the subject, will be useful as showing generally what amount of rain-fall is considered necessary in the respective districts to secure a fair harvest of all the crops grown. The principle underlying these replies is the same throughout, viz., that the times for conducting particular operations have been so fixed that the expected rains may not injure but assist the growth of the crop at its several stages. The remarks of the Collectors of Vizagapatam and Kistna may be considered to be applicable to the whole of the Northern Circars, of Kurnool to the ceded districts, of Coimbatore to Salem, of Tanjore to Trichinopoly, and of South Canara to Malabar. The Collector of Vizagapatam, Mr. Goodrich, says:—

"No two falls of rain are exactly alike in the suddenness of their fall and in the strength of the wind which accompanies them.

"Periods of drought vary in their mischievous effects infinitely according to rain-fall that may have preceded them.

"Paddy requires about 3 inches in June for the seed beds and to begin ploughing. In July or in the beginning of August there is needed a fortnight's rain amounting to 6 or 8 inches if a good plant-out is to be effected. There ought not to be more than 10 dry days consecutively between the 20th June and the 1st September. September needs about 4 inches, and thrice that amount will do no harm. Four inches will not be enough unless previous rains have been copious. October needs 6 or 8 inches, and twice that amount will do no harm.

"Light rain between 15th June and 15th September will do for ragi, provided that not more than 15 days' drought occurs at any time; 20 days nearly ruins the crop, unless there have been very heavy previous rain.

"Cumbu will bear almost any amount of rain without wind. If a gale accompanies rain after the 1st July, mischief is done to all riper fields in exposed situations.

"Jonna is not grown in this district as much as it deserves to be. On black soil, retentive of moisture, it will do with very little rain, but sandy soil if red will not produce it."

Mr. Crole writes of Kurnool—

"Judging from the registered rain-fall of the last 10 years as compared with the general character of out-turn as stated in annual reports, the amount of rain-fall required for the whole year for a good crop in this district seems to be about 25 inches. If, however, the rains are regularly distributed, about 15 inches would be sufficient as shown below:—

	Inches.
May	2
June	3
July	3
August	4
September	2
October	2

"The popular saying is, and there can be no doubt of its correctness, that one good fall of rain about an inch and a half, in each fortnight after seed is sown, is sufficient for agricultural necessities. But the success of a crop does not seem to depend so much on the quantity of rain which falls as on its proper distribution over the different periods of agricultural operations and at different stages of the crop growth.

"*Ploughing.*—This operation is conducted at any time of the year, provided there is sufficient moisture in the ground. In a very large number of cases the ryots do this during their leisure hours between reaping and sowing.

"This early preparation of the ground called 'magali' (or seasoning of the earth) is considered by the ryots as peculiarly favourable to the future crop. The general practice, however, is to plough the land in the months of April and May, immediately after the burst of the first rain. Any amount of rain may fall in these months without producing any bad result, neither does the absence of the rain seriously affect, though it may greatly inconvenience, future

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operations. In the beginning of June, however, or about a week before the commencement of the sowing season, a good fall of rain varying from one inch in light to two in clayey soils is absolutely necessary.

"The ryots say that the quantity of rain absolutely required for sowing purposes is as much as would suffice to moisten the ground to a depth of about 6 inches from the surface (or from 1 to 2 inches).

"If the rains are late, say about a fortnight, a shorter quantity of rain moistening a less depth of ground than 6 inches will be accepted as sufficient in the belief that the advancement of the rainy season would compensate for the deficient moisture.

"If the rains fail altogether during the first fortnight of July, yellow jonna cultivation has to be given up, because the sowing of this crop later than July would subject the tender plant to excessive rain in August and September, the chief rainy months, and lessen seriously its chance of getting enough rain in the third month of its growth, when rain is essential to the development of the pótta or opened tender ear of corn, so that people never grow yellow jonna in the latter part of July.

"If, however, heavy rains fall in July and August, so as to moisten the ground to the full depth, *i.e.*, as far down as the sub-soil, they prove highly useful for sowing the later jonna in September and October. The bad effect of the early failure would be neutralized by subsequent rains.

"Again, if the rains fall earlier than June, and even if a sufficient depth of ground is moistened, jonna is, as a rule, not sown in the belief that sowing early makes the plant grow too tall and proportionately lessens the size of the ear.

"After the seed is sown cessation of rain for at least three or four days is absolutely necessary. It is more so in black than in red soil. Otherwise the clods of earth firmly stick to the seed and thereby delay and sometimes prevent germination, while all sorts of weeds begin to grow and in a measure choke the seedling.

"About 20 or 30 days after germination the weeding operation is usually performed. The quantity of rain required during the interval is in proportion to the nature of the soil and the extent to which the ground has already been moistened.

"In light soils less rain, say a *padanu* within 15 days after sowing, would be sufficient. In more clayey soils, if the ground had been moistened to the full depth when seed was sown, a slight fall to moisten the plant would be sufficient. Otherwise more rain would be necessary. After a month rain would be absolutely necessary. Any excess of rain or continued fall will conduce to the rapid growth of weeds, and by keeping the land continually muddy prevent weeding, as has been the case in very many instances during the present season, and discolour the plant. If the rains fall at proper intervals, the aggregate quantity in a month, though large, will not affect the growing crop seriously. Hence the aggregate monthly quantity does not afford a good test by which to judge of the favourable or unfavourable result. A fortnightly report will give a more correct means of ascertaining the true state of crops.

"If the rains fail for 15 days in light soils and a month in black soils after sowing, the crop, it is said, will begin to droop.

"Again, if in the second month after the crop is weeded the rains should fail within 15 days, the crops whose vitality has already been weakened by the weeding process would begin to suffer. The lateness in the fall of this rain results in a proportionate decrease in the yield of the crop.

"*Weeding operation.*—The weeding process is generally gone through twice or thrice, according to the means of the ryot, and according to the quantity of the weeds requiring to be removed, which grow more or less with reference to the nature of the soil, and the amount of rain that may have fallen. For weeding, cessation of rain indispensable."

Mr. Martin, [illegible] collector of Madura, remarks—

"In April there are no dry operations and no crop to be injured by rain except by what is known as Tai bhogum crop under wells in Pulney Taluk which should be nearly ripe. Any amount of rain in April will be valuable for ploughing the dry land and preparing the wet lands for what is called the Kodai crop.

"In May there are no crops of any extent that can be injured by rain, and the more falls the better, so long as the tanks do not breach, for ploughing in dry lands will continue and sowing of wet lands.

"The highest record in this part of the country was in Fasli 1277, and then there were about 7½ inches without bad results in May. In June there is no general harvest nor general sowing, and the minimum rain-fall required for ploughing is 1 inch; there is no danger from heavy rain-fall. The minimum of July may be a little less than that of June to continue the ploughing and to sow. It is taken at three-quarters of an inch, because in the good year of Fasli 1284 that was the whole amount recorded.

"The maximum for July should be about four inches. More than that will interfere with cultivation by washing away the seed and making the ground too cold. In August the minimum required varies from three-quarters of an inch to two inches, according as the crops are only to be sown or brought on. These crops will bear as much as six inches as the maximum.

"The minimum in September varies from three-quarters to three inches. The maximum recorded in September was last year, and the crops did not suffer by it because it followed great drought; there is no data to show whether they could have stood it after heavy August rain; probably five or six inches would have been as much as would have been good for them considering the absence of sun in this month. In Fasli 1282 they stood with advantage nearly seven inches.

"In October and November the growing plants are strong, and will bear more rain than in August and September. There is also more sun. Three inches is about the minimum they should have in October except certain crops which require more moisture at different periods. Eight inches is about the maximum as the plants get stronger.

"In November the minimum required is about four inches for the majority of crops with similar exceptions.

"In December the crops are ripening and should have only a light equally distributed rainfall, the minimum being one and a half inches and the maximum four inches.

"In January, February, and March no agricultural operations are commenced on dry lands. Harvesting of both dry and wet lands go on in those months, and the only operations commenced are under wells. If these have received a proper supply they can do without rain; therefore, ordinarily, rain is not required at all in January, February, and March. In these months light rain equally distributed will do no harm, but any heavy long continued shower will do so by knocking the grain out of the ear. Two inches of violent rain in either January, February, or March will harm the grain and paddy wherever it falls, but as rain usually falls in local thunder showers, it is impossible to answer this question with reference to the whole harvest of a taluk.

"The tanks, if provided with proper escapes, will stand any amount of rain; and the above remarks have no reference to maximum rainfall for wet land. The wet crops suffer from deficient water in the tanks, and the minimum rain-fall necessary to secure the area usually irrigated at the different times of year has been assumed to be what is wanted."

Mr. E. Forster Webster, the Collector of Tanjore, says:—

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"The cultivation of paddy is carried on chiefly under river irrigation. In the month of September, when the rice plants are young and delicate, slight showers are required. In the month of October and November, when the plants of samba, pashanam, or later crop planted in September and reaped in February are about half grown, copious rains are required, followed by light showers in December and January. For the successful cultivation of rice crop regular and ample supply of water in the river is required during five months, viz., from July to November, a slight fresh being sufficient in the months of June and December. For dry crops rain is more or less necessary during eight months of the year, viz., from June to January, copious falls being required in the months of June and July, and also shortly before the harvest in October and November.

"In the case of paddy there should be no rain on the day next to that of planting. Excess of rain can do no harm if there is sufficient drainage for the land, otherwise the young plant will rot.

"After transplantation the plants require no rain for about a fortnight, and if light rains then fall the plants will be strong and healthy.

"Light rains do good to the plants when they are coming into ear, but very heavy rains at this time are likely to prevent the grain from forming properly, and are therefore most disastrous to the crop."

As regards Coimbatore, Mr. A. McCallum Webster remarks:—

"Cholum, ragi, and cumbu are the grains which form the staple food of the people in this district. During the ploughing season a heavy fall of rain of at least one inch is required, and for the subsequent ploughing and sowing another heavy fall necessary. Rain at intervals is most essential to them for about a month after they are sown. Failure of rain after they are sown would be mischievous or ruinous, depending upon the extent of the failure and the length of time it lasted. These crops require to be kept constantly moist for about a month or so after being sown. Failure of rain during that time for a space of 20 days would most probably be mischievous, and could not be remedied by good rain afterwards. When the plants are a little more than a month old, heavy and continuous rain would cause them to turn pale and become stunted, and thus would be mischievous. Again, when they are putting forth the ear (October and November) in ordinary seasons excessive rain would be mischievous. Crops come into ear about three months after sowing, except ragi, which ears in about two months, and to which excessive Coimbatore rain would not do any harm. Again, at harvest time (November and December) excessive rain would be mischievous. When the crops are at the middle of their growth (September and October) good rains are required. Failure then would be mischievous or ruinous, depending upon the extent of failure. It follows, therefore, that it is most important to the ryot to have his crops sown at the proper time, so that they may get good rains when they want them most and when they are most likely to get them. Failure of preliminary rains might thus do a great deal of harm eventually by preventing ploughing, &c., operations which necessarily precede, sowing being carried on at the proper time. The sowing would be late and the plants would get excessive rains when they might not be able to bear them."

Mr. Comyn, Collector of South Canara, writes:—

"The first rice crop being dependent on the falling rain, what is wanted is fairly continuous rain without long breaks. One inch a day for every day of these months would be ample; two inches a day would do no harm; but if 30 inches or more were to fall during any one week in the month, and there were no rain for the remaining three weeks, the crop would perish. A break of even a fortnight would do harm. In August continuous rain is not wanted except for the high-lying lands, from which water soon runs off, and even then sunshine is an advantage. In September, when the crops are approaching maturity, anything more than the maximum given would do harm; for a fair amount of sunshine is required to ripen the crop, while heavy rain lays the crop already heavy in ear level with the ground, and rots the straw and sometimes the grain. It is impossible to state accurately the maximum amount of rain which may fall without doing injury. Low-lying lands, locally termed 'Patla,' cannot be cultivated until the water standing on them subsides to a certain extent. The cultivation of these lands is taken up later than that of the ordinary rice lands, and is more liable to be injuriously affected by continuous excessive rain than lands situated on a higher level, which have means of drainage. The character and the position of the lands in the district is so varied, that any accurate general statement showing the maximum or minimum quantity of water that may be required for the growth of the crops cannot be given. The quantity shown as the minimum is that supposed to be necessary to secure an average crop of 12 annas, but agriculturists have a very vague idea of what an inch of rain means.

"The second rice crop is partly dependent upon the rains that fall in these months, but chiefly on water from tanks and streams which are rain-fed.

"The third rice crop does not require rain, but is cultivated with the aid of water obtained from tanks or streams by natural or artificial means. Some kind or other of reservoir or nullai constructed in every land cultivated with the second and third crops. The water supply of course depends on the character of the monsoon. The minimum rain-fall given at the head of this statement, though probably sufficient to bring the first rice crop to maturity, would not suffice to keep in full flow the rivers and channels on which the second and third rice crops depend. A much greater fall would be required for this. The maximum rain-fall in any one of the last 10 years was 181 inches (1874–75), and the minimum 116 (in 1873–74 and 1875–76), when the supply was not sufficient for the second and third rice crops. The average rain-fall of the last 10 years was 137 inches, which is ample for all purposes. The rain-fall should be evenly distributed. Injury by deficient rain-fall in May or June may be remedied by rain in July and August, but should the July rains also be scanty, no subsequent rain will be of any use for this crop. Excessive rain is not likely to prove so injurious as deficient rain. Excessive rain is only to be feared in September or the beginning of October when the first rice crop is ripening and is harvested. Such rain, however, is not without its use; for a prolonged and heavy monsoon is beneficial to the second and third rice crops, not because these crops depend on the falling rain, the case being the reverse, but on account of the plentiful supply of water which such a monsoon secures for the irrigation of the lands on which these crops are raised."

As will have been seen from the preceding remarks, seasonable distribution is of prime importance, and this is further illustrated by the fact that paddy is extensively grown in districts the average rain-fall of which varies from 143·60 to 22·85 inches. Dry crops are also cultivated within the same limits of variation, though not to any great extent; but even where these crops are grown as staples the average rain-fall varies from 48·22 to 22·85. For wet cultivation, however, in all but the West Coast Districts the question is really whether the rain-fall is sufficient to ensure a sufficient supply to the tanks and channels, and provided this is secured the distribution of the rain-fall is not of so much consequence as for dry cultivation, although it is generally considered that the total absence of falling rains or an excess of clear sky during the cultivation season affects the out-turn of crops even where there is sufficient water for irrigation. Garden cultivation may be said to be almost independent of rain-fall unless the drought is so great

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as to dry up the subsoil supply. In Malabar and South Canara, where the rains never entirely fail, crops are not so much injured by drought as by excess of rain; the soil is improved by being exposed to the action of the sun in March and April, and rain in these months is injurious.

The combination of circumstances under which the worst results are likely to be produced may be said to be unseasonable distribution, combined with deficient rain-fall. It may perhaps be safely said that where the actual rain-fall of any particular year falls below the average by a quantity exceeding 40 per cent. the result must be failure of crop.

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For agricultural purposes the divisions of the rains are considered to consist of three well-defined periods.

First. Those which fall between the beginning of the Hindu year, and the commencement of the south-west monsoon; *i. e.* from about the end of March to the end of the first week in June.

Second. The south-west monsoon from June to August.

Third. The later rains of September, October, and November.

The first or "Múngar" rains are known also as "Dodda" or "Addamale," that is heavy downpours, resulting from the crossing of currents of air, attended with thunder and lightning, and ordinarily coming from north or north-east.

The south-west monsoon rains are styled "Maddhya" or middle rains, and described as "Sône," that is continuous mild showers or drizzle, with steady south-west wind, unattended with storms, and the last are the "Hingar," or latest rains of the other monsoon. Showers and even heavy falls occur during the winter months, but this is not reckoned as a rainy season.

From this system of rain-fall is derived the principle on which the year is divided into seasons, comprising three periods :—

1. The "Múngar" or early season, including the two first periods of rain.
2. The "Hingar" or late season, including the second or "Hingar" period of rain.
3. The dry season. From the close of the Hingar to the beginning of the Múngar rains.

Each of these seasons has its own distinct crops requiring varied operations, and the crops sown in the "Múngar" or "Hingar" season take their names from the season in which they are sown. In their progress towards maturity, however, they extend into the next period, so that the "Múngar" crop, known also as "Kár," ripens and is cut in the Hingar season, while the "Hingar," styled "Hyne," or principal crop, is harvested in the cold weather.

This last period has also its own cultivation, consisting chiefly of a rice crop, sown in the cold weather, under tanks which have received a supply either from the thunder plumps in the early months of the year, or the later falls of the north-east monsoon in October and November. This may be shown as follows :—

Rains.	Period.	Seasons.	Crop.
Múngar, early "Dodda" or "Adda," "Male" or irregular rains.	From about end of March to end of 1st week in June.	Múngar.	Múngar.
"Sone" or S.W. monsoon, "Maddhya" or middle rains.	From June to August or September.	Hingar.	Hingar.
Hingar late rains, N.E. monsoon.	September to November or part of December.	Do.	Do.
Dry season.	December to March.	Dry season called "Garbha" or pregnant, from the idea that the clouds are gradually forming rain to descend at a future period.	Harvest in following year.

The terms "Múngar" and "Hingar" are, however, usually confined to crops on unirrigated lands, and which are dependent entirely on the monsoon or other rains. The river-fed channel crops, including rice, sugar-cane, and some pulses, are described simply as "Vyshak" and "Kártik," from the months in which they are ripe; and these terms are also applied to the rice crops under tanks which are dependent for their water supply upon the monsoons.

The early rains are the period for sowing Cholum and the Gid or shot Ragi, as well as oil seeds, and various pulses with good deal of Paddy, and all operations, including sowing, must be got through before the actual arrival of the south-west monsoon; for if the seed is not well above the ground by that time, the season may be said to be lost.

In addition to these cereals, a variety of other products are also sown during the first rains, to be cut during the Hingar period, and these are reckoned to be the following :—

Múngar or early dry crops.

A. Cereals.
  1. Cholum, great millet—Holcus sorghum.
  2. Gid ragi—Khar ragi—Cynosorus Corocanus.
  3. Sujje—Spiked millet—Holcus spicatus.
  4. Navane or Italian millet—Panicum Italicum.
  5. Sámé or Sáve—Little millet—Panicum frumentaceum.
  6. Baragoo—Little millet—Panicum Miliaceum.

B. Pulses.
  1. Ooddoo—Black gram—Phaseolus minimus.
  2. Hessaru—Green gram—Phaseolus mungo.
  3. Alasandi or Tadagani—Dolichos catiang.

C. Oil seeds.
  1. Wollellu or Achellu—Gingelly—Sessamum orientale.

The Hingar or Hyne dry crops.

A. Cereals.
  1. Ragi—Ragi—Cynosurus Corocanus.
  2. Cholum—Great millet—Holcus sorghum.
  3. Harka—Great millet—Panicum semiverticillatum.
  4. Sujje—Spiked millet—Holcus spicatus.
  5. Same or Save—Little millet—Panicum frumentaceum.
  6. Navane—Italian millet—Panicum Italicum.
  7. Baragoo—Italian millet—Panicum Miliaceum.

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B. Pulses.
  1. Ooddoo—Black gram—Phaseolus minimus.
  2. Hessaru—Green gram—Phaseolus mungo.
  3. Togari or Tovari—Pigeon pead hall—Cajanus Indicus.
  4. Alasandi or Tadagani—Delichos catiang.
  5. Avare—Cow gram—Dolichos labal.
  6. Hurali—Horse gram—Dolichos uniflorus.

C. Oil seeds.
  1. Hoochellu or Prantil—Foolish oil plant—Guizoteas oleifera.
  2. Wollellu or Achellu, Gingelly—Sessamum orientale.
  3. Haraloo—Castor oil—Recinus communis.

The dry crops given in the cold weather are.

I. Cereals,—nil.
II. Pulses.
  1. Kadale—Bengal gram—Cicer arietinum.
III. Oil seeds,—nil.

Special produce.

1. Sugar-cane.
2. Tobacco.
3. Cotton.

Miscellaneous produce.

1. Chillies.
2. Coriander seed.

The Hindoo agricultural year is reckoned from March to March, or from the date on which the sun enters Pisces to that on which he leaves Aquarius. The three main periods, namely, two rainy seasons of Múngar (early) and Hingar (late) and one Garbha (dry weather) are divided into 27 parts of 13½ days each, distinguished by the names of the principal stars of the asterisms in which the moon is set down in the calendar as entering and remaining, and in accordance with this division the rains are supposed to be distributed in corresponding periods, the division being continued throughout the dry season, though rain may not fall at that time.

The dates and duration of these for 1877 are given below, as well as the agricultural operations usually carried on at this time.

The three main periods or seasons.	No.	Names of the Stars from which the rains receive their names.	Principal Star of Asterism.	No. of days or duration of each Star.	English Months and Dates.	The Twelve Signs of the Zodiac.
	1	Oottrabhadrapati	A Andromedæ	13½	15th to 28th March	Pisces.
	2	Revati	S Piscium	13½	29th March to 10th April	
	3	Aswini	B Arietis	13½	11th to 24th April	Aries.
	4	Bharani	35 Arietis	13½	25th April to 7th May	
	5	Krittika	21 Tauri alcyonis	13½	8th May to 21st May	
	6	Rohini	A Tauri aldebaran	13½	22nd May to 4th June	Taurus.
	7	Mrugasira	Orionis	13½	5th to 18th June	
	8	Aridra	A Orionis	13½	19th June to 2nd July	Gemini.
	9	Punarvasu	B Geminorum pollux	13½	3rd to 16th July	
	10	Pooshya	Cancri	13½	17th to 30th July	Cancer.
	11	Aslesha	E Hydræ	13½	31st July to 13th August	
	12	Makha	A Leonis Regulus	13½	14th to 27th August	Leo.
	13	Poobba	Leonis	13½	28th August to 10th September.	
	14	Oottra	B Leonis	13½	11th to 24th September	
	15	Husta	Corvi	13½	25th September to 7th October.	Virgo.
	16	Chittah	A Virginis spica	13½	8th to 21st October	
	17	Swati	A Bootis Arctur	13½	22nd October to 3rd November.	Libra.
	18	Vishakha	V Libra	13½	4th to 16th November	
	19	Anoradha	Scorpionis	13½	17th to 29th November	Scorpio.
	20	Jeshta	A Scorpionis autares	13½	30th to 13th December	
	21	Mula	Scorpionis	13½	14th to 26th December	Sagittarius.
	22	Purvashada	Sagittarü	13½	27th December to 9th January.	
	23	Oottrashada	6 Sagittarü	13½	10th to 23rd January	
	24	Shravana	A Aquinla attair	13½	24th January to 6th February.	Capricornus.
	25	Dhanishta	B Delphini	13½	7th to 19th February	
	26	Shatebhisha	Aquarü	13½	20th February to 2nd March.	Aquarius.
	27	Purvabhdrapati	A Pegasi	13½	3rd to 14th March	

The time occupied by the preliminary operations connected with the Múngar crop,* its sowing, maturing, and harvesting, may be taken as extending from the latter end of March till near the close of August or middle of September, and the heavy falls required to ensure a good crop are known as "Hadas," or saturations of the soil to the depth of about a span, which is estimated by those who have compared it with the rain-gauge as equal approximately to one inch of rain.

It is very difficult to obtain information which can be relied on regarding the precise amount of rain required to ensure a good crop, and still more to determine how the fall can best be distributed or the extent to which either the quantity or the times can be varied without serious injury to the crop.

The total quantity shown as having fallen in any month is no certain test, as a small quantity falling in timely showers is often better than heavy downpours with long intervals between them.

The rain required varies with soil and locality. Different crops also prosper with greater or less quantities of rain; but a rough estimate of a favourable season gives for the Múngar or early dry crops about 20 inches for cereals, 17 or 18 for pulses and oil seeds between March and August.

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* Rain Múngar Crop.

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The average for these months of the seven years 1872–78 is :—

	Inches.	Cents.
Mysore - - -	13	88
Hassan - - -	16	80

The average of the same months for 12 years 1865 to 1876 is :—

	Inches.	Cents.	
Mysore - -	16	26	according to the Register at Mysore Jail.
Hassan - -	18	30	According to the Register at the Civil Hospital at Hassan.

The same rough estimate gives 30 inches as needed for the "Hingar" or late dry crops between April and November, while the average of 12 years for the period is :—

Inches.	Cents.	
26	30	at Mysore.
30	32	at Hassan.

RAJPUTANA.

Rajputana.

Dr. Moore.

The rain-fall is principally from the south-west monsoon, which, however, passing over the sands of Guzerat, loses much of its force before arriving over Rajputána, until, in the semi-desert district of Marwar, Jeysulmeer, and Bickaneer, the fall does not exceed 5 or 6 inches per annum. The more easterly districts to the east of the Aravelli mountains obtain also, during the earlier part of the monsoon, rain from the north-east, being the last gift of the clouds from the Bay of Bengal and the valley of the Ganges, which, instead of passing to the east, are deflected by the Himalaya mountains in a westerly direction, curving towards Central India, and even reaching the western districts of Rajputana. Roughly speaking, it may be stated that the rain-fall of Rajputána is determined by the Aravelli range of mountains, which, culminating in their highest altitude in the extreme south at Mount Aboo, run in a north-easterly direction almost through the centre of the province, being distinct as a wall for some 150 miles to Ajmere, and then continuing in a more broken manner as far as Delhi. To the west of the range the country is sandy, and the fall averages from 20 to 30 inches at the base of the hills, but, decreasing until in the far west at Jeysulmeer and Bickaneer, the fall does not exceed 5 or 6 inches, becoming almost *nil* in the extreme west, which may be regarded as the southern verge of the rainless tract stretching through from Central Asia to Northern Africa. To the east of the Aravelli range the rain-fall averages 30 inches, increasing as easterly progress is made, until the more copious rain-fall of the Central Provinces and of Central India is realised.

The rainy season commences about the beginning of July, accompanied on the east side of the Aravelli range by thunder-storms from the east, if the eastern monsoon (from the Bay of Bengal) is in force. August is the wettest month everywhere, September being often dry, but sometimes showery. There are also showers about Christmas from the north.

The rain-fall in Rajputana cannot vary much as regards diminution, without grave injury to the cultivation, and without causing a scarcity in the supply of grass, necessary for the enormous herds of cattle and flocks of sheep, forming the principal wealth of the province. It is scarcely possible for it to increase more than is acceptable, provided it does not fall at unseasonable periods. Too much rain, excepting perhaps in the extreme eastern districts, has scarcely fallen within the memory of man. Local storms may have sometimes flooded towns, or caused the downfall of some wretchedly constructed houses. But such falls have been emphatically local, the whole country never being deluged to the extent occurring in other provinces, where crops have been destroyed from such causes.

The amount of rain-fall for the whole year, which may be considered sufficient for agricultural purposes, is not less to the east of the Aravelli range than 30 inches. Here the soil is comparatively heavy, in some localities quite black, the country hilly, and much of the water is drained off by the Bunnass, the Chumbul, the Nej, and other smaller rivers piercing the country. To the west of the Aravelli range the country is sandy, the rain falling is absorbed and remains in the soil, and there are no draining rivers, the solitary exception being the Loonee, which, however, only passes through a small part of the country, the south of Marwar. Here, then, the smaller rain-fall of 12 inches suffices for the wants of the cultivators.

To furnish the best results, the rain-fall should be distributed throughout the wet months to the west of the Aravelli—3 inches in July, 8 inches in August, 2 in September, and 1 at Christmas. To the east of the Aravelli—6 inches in July, 18 in August, 4 in September, and 2 at Christmas. This is of course approximate.

Captain Barr.

Marwar and Jeysulmere.—The rain comes from the south-west and north-east, but the force of both monsoons appears to be exhausted before it reaches the semi-desert tracts of Marwar and Jeysulmere, for the average rain-fall is very small, and decreases from the south and south-west portions of the district to a minimum of 3 or 4 inches only in the north, north-west, and north-east.

The chief supply of rain comes from the south-west, and July, August, and the beginning of September is the period during which rain is expected. At Jodhpore, which may be taken as the centre of Marwar, the rain-fall gauged during the last seven years is as follows:—

	Inches.
1872 - - - -	22·45
1873 - - - -	11·00
1874 - - - -	6·38
1875 - - - -	13·92
1876 - - - -	25·9
1877 - - - -	4·5
1878 - - - -	19·5

Giving an average rain-fall of 14·78 inches. No register is kept of monthly falls, and, with the exception of that at Jodhpore, no rain gauge is maintained in any portion of the district. Generally speaking, a fall of 6 inches is sufficient, when well distributed, to produce an average out-turn of crops; anything less than this produces a failure both of food grains and of grass, upon which the wealth of the district mainly depends. To secure favourable harvests the rain-fall should be about 15 inches, and should be distributed as follows:—July 4 inches, August 5 inches, September 4 inches, December 2 inches.

The kharif crops of bajra, jowar, moth, moong, and maize are sown after the first fall of rain, the land being broken up after the early showers, which usually herald the approach of the south-west monsoon.

The sowings are generally completed early in July; rain is required during the month for the first spring of the crop, and later to promote its growth; the fall in August and September should be sufficient to keep the crops to their full strength during the process of growth and ripening.

CHAP. I. QN.

RAJPUTANA.

Captain Bar

The later rains, *i.e.* the last falls of either the north-east or south-west monsoon, have a double use in completing the success of the rain crops, and in moistening the soil preparatory to the rabi sowings, which generally commence in October, and are completed by the end of November. A fall of 2 inches in the end of December or the beginning of January is most beneficial to the rabi crops, which are then in the blade. An element which is worthy of notice, though frequently overlooked in the examination of registers of rain-fall, is the general condition of the weather during the months in which rain is expected. In some seasons the return of rain-fall is swelled by some unusually heavy falls at intervals during the monsoon months, the weather between these falls being marked by excessive heat, the sun being but little obscured, and the air dry. In other seasons, though the registered rain-fall was small, it has been well distributed, and the period between the falls has been marked by cool weather, a cloudy sky, and an air laden with moisture.

A failure of early fall in July is not disastrous in this district. Sowings are deferred, but with a good harvest the year before, the accumulations of food grains and grass are sufficient for present wants. It is only when the months of July and August pass without rain that hopes of the kharif fade. Should the drought continue throughout September, or the rain-fall be insufficient for the growth even of grass, the worst combination of circumstances may be said to have arrived, and a "tirkal" or a famine of water, grass, and grain falls upon the country.

CENTRAL INDIA.

CENTRAL INDIA.

Mr. Winga

Agency.	Station.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	Average.
		In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Bhopal -	Agency Hospital -	27·6	41·0	61·6	84·9	36·4	45·8	65·7	55·9	60·3	32·5	51·1
Baghelkhand -	Rewah „ -	—	—	—	—	56·4	53·5	66·7	83·5	84·2	36·4	63·4
	Sutna „ -	—	—	—	—	43·3	45·1	41·6	60·5	41·5	31·8	44·0
	Nagode „ -	—	—	—	—	47·0	55·2	52·2	85·4	58·6	40·4	56·4
Western Malwa -	Agar „ -	30·1	28·5	30·5	—	41·1	38·6	45·7	51·1	42·7	16·8	36·1
Deputy Bheel Agency	Manpur Dispensary	26·5	36·5	37·7	47·7	37·9	40·4	35·3	42·5	33·7	28·9	36·7

In the Bhopal and W. Malwa Agencies the rains are described as generally setting in from the east and north-east, though occasionally from the south-west.

The Baghelkhand and Deputy Bheel Agencies (Manpur), on the other hand, state the monsoon is mainly from the south-west, though supplemented from the north-east. As the meeting of the north-east and south-west currents is believed to occur hereabouts, the Baghelkhand Agency have taken some pains to record the wind direction with the rain-fall, with the following result:—

	From East.	From West.	Per-centage from East.
At Rewah -	19·29	41·09	31·9
At Sutna -	6·19	35·84	14·7
At Nagode -	10·33	43·70	18·0

The rains begin in the middle of June and cease about the end of September or beginning of October. July is usually the wettest month. Lieutenant-Colonel Bannerman (Baghelkhand) says one-third of the annual fall occurs in July.

Agency.	Limits within which rain-fall may safely vary.	Distribution.				Remarks.
		June.	July.	August.	Sept.	
Bhopal -	45 to 70	2	22	13	5	Actual fall of 1878; this may be taken as typical.
Baghelkhand -	23 to 60	1½	5½	10	7	A *minimum* fall of 26 inches, and includes 1 to 2 in., December–January.
W. Malwa -	32 to 40	8	6	12	6	A sufficient fall.
Rutlam -	——	5·5	12·5	12·0	8·2	Average monthly fall registered since 1868.
Manpur -	——	6	11½	8¾	8½	Monthly average for six years.

In W. Malwa in 1877 the fall only amounted to 12·21 inches from June to October, and yet the Indian corn was good and the joát unusually abundant, but the rabi suffered much.

In Central India the kharif is sown about June, and the rabi in October—November. Generally a heavier rain-fall injures the kharif and benefits the rabi. The winter rain appears to be very irregular, but benefits the wheat, gram, and opium, and is indispensable after an insufficient or scanty monsoon. In Baghelkhand, from 1½ to 2½ inches fall in December—January. In Rutlam, Mir Shahamat Ali, C.S.I., says the rain between 15th July and 15th August produces insects in the crops if not washed away by continued showers in the latter fortnight of August.

HYDERABAD.

HYDERAB

Moulvie M

What are the different agricultural operations depending on the due arrival of each of the expected monsoons, or seasonal rains? In answering this question we shall deal with Telingana and Marahatwari separately. The account given for the Telingana province is the result of inquiries conducted by the talukdars, while that for Marahatwari is taken from a book entitled "Notes on the Agriculturists of the Aurangábad District," by Mr. Fardunji Jamshedji.

H P.I. Qn. 1.

DERABAD.

C. Mahdi Ali.

Telingana.

Rohini (May 23rd to June 5th).—Rain sometimes falls during this naxtra,* which is not included in the category of the monsoon naxtras. The lands are first cleared of stones and scrub, and then ploughed for the kharif sowings. Sheep are folded on lands prepared for the abi rice crop. Thorns, &c. are collected for forming the field hedges. Agricultural implements, such as ploughs, harrows, &c., are mended, and the Bhagelas (a tribe) engaged as servants and labourers. The last harvesting of the tabi† rice takes place during this season.

Mirg (June 6th to 19th).—Ploughing mostly takes place on kharif lands, which are afterwards sown. Sawan, barag, kudru, kangni, maize, gingelly, urd, mung, lobha, and so forth, are sown during this month.

Ardra (June 20th to July 3rd).—Ploughing operations are still continued. Yellow jowar, hemp, cotton, and bajra are sown during this month. In garden lands vegetables are sown. Lands sown in *Mirg* are now worked with a bullock hoe. Irrigation beds are formed in lands prepared for the abi paddy crops. These are filled with water, and then the ground is ploughed thrice. It is subsequently worked with a harrow. Frequently vegetable matter is mixed with the slush formed on the surface of the fields, and allowed to rot there. The land is now re-ploughed, and is prepared to receive the seed. The seed, after being previously soaked in water for about three days, is sown broadcast. Fields are hedged in.

Punarwasu (July 4th to 17th).—Ploughing and sowing operations are carried on in the same way as that described above. Sowings of the abi paddy are general. Fields under kharif crops are weeded.

Pushya and Ashlesha (July 18th to August 14th).—Operations similar to those described above are conducted, excepting that not much ploughing is done during this naxtra. Transplantation of the paddy plants takes place in most of the fields; in others the crops are thinned, and weeded by hand. Fields under cotton are also weeded. Lands for the rabi are levelled with the bakhar.

Magha (August 15th to 28th).—This is the latest season for abi rice sowings. Tobacco is sown in nursery beds. The abi paddy crops are weeded, and transplantation takes place. Frequently the top shoots of the paddy plants are nipped off.

Purvá (August 29th to September 10th).—Of the kharif crops, mung is ready for harvest. The other operations are similar to those mentioned in the last two naxtras.

Uttra (September 11th to 24th).—The last weeding of the abi rice crops takes place. The tops of the plants are nipped off. Mung, urd, yellow joár, kangni, kudrú, and such crops are cut.

Hast (September 25th to October 8th).—Rabi crops, such as white joár, gram, linseed, barley, lakh, peas, safflower seed, &c., are sown; garden crops are also sown about this season, and the lands are manured. Bajra and yellow joár and the remaining kharif crops are now cut. The first cotton pickings take place. Tobacco seedlings are transplanted. Land for *tabi* crops is prepared, irrigation beds are formed, and the ground is watered.

Chitrá (October 9th to 21st).—The cultivators begin to cut and harvest the kharif crops. The gingelly crop is cut, bound up in bundles, three or four of them being placed in an upright position, resting one against the other, to prevent the seed dropping out. White joár, gram, safflower seed, linseed, and other rabi crops are sown. Besides the kharif and rabi crops, there is a third seasonal crop grown, which is termed *maghi*.

The maghi crops are grown about two or three weeks after the rabi sowings are finished, and these crops are raised on poor soils. Hollow ground is generally selected for this purpose, as it retains rain water. Lands for the mung crops are ploughed about this season.

Barley is sown in garden lands. The abi paddy is watered, and the crops watched. In some places this crop is harvested.

Swáti (October 22nd to November 3rd).—The kharif crops, such as bajra, yellow joár, &c., are threshed and winnowed. The abi rice is harvested. Land is prepared for sugar-cane, manure, &c. being applied. The last rabi sowings take place during this season. Land for the *maghi* crop is reploughed, and karela, kulthi, &c. are sown.

Vishakha (November 4th to 17th).—The rabi crops are weeded by means of a bullock hoe. The *maghi* crop sowings are finished during this season. The abi rice is harvested, and the straw is stacked. Sugar-cane is planted. Kolus (sugar-cane mills) are fixed and the juice expressed and prepared for *gur*. Land for the rabi rice crop is prepared with manure, and irrigation beds formed.

Marahatwari.

Jeshth (June).*—The cultivator is diligently employed in levelling his lands with the bakhar or hoe-plough. If the rains have been favourable and the ground well saturated, kharif sowings take place. Cotton, hemp, til, mung, and túr are sown through a bamboo seed-drill. Garden lands are prepared and manured for the sowings of ground-nut. Seedlings of red pepper, which have been raised previously in nursery beds, are now transplanted to garden land. Tobacco seed is also sown in nursery beds during this month. Sugar-cane fields are weeded by women, and other lands manured and prepared for planting the cane. The cane is watered about six times during this month. Guwari (dolichos fabœformis), bhendi (hibiscus esculentus), chaoli, and other vegetable seeds are sown. Varieties of gourd are also sown. The women assist the cultivator in collecting the scrub, weeds, &c., that are uprooted by the bakhar, and this they sometimes use as fuel.

Ashad (July).†—This is one of the few exceedingly busy months for the kunbi. Such lands as have not been sown during the preceding months are now worked again with the bakhar. All the cultivators are busy with this uncouth-looking, but very effective implement, wherewith both kharif and rabi lands are now levelled. The rest of the kharif sowings take place now, and are completed during the month. Bajri, maize, túr, urd, kulthi, hemp, rála, &c. are sown. In garden lands ground-nut is sown, and seedlings of egg-plant and red pepper are transplanted. Khonde joár (a coarse grain) is in this month ready for the sickle: this species of joár is only raised in garden lands, and is chiefly used for home consumption. Kaddol, which is raised for fodder, is also cut during this month, and the working bullocks fed on it: it is a rich fodder for cattle. About four waterings are given in this month to the sugar-cane.

Shravan (August).‡—Such lands for rabi as have not been ploughed for some years are now harrowed and then levelled with the bakhar. Fields under cotton, bajra, mung, &c. are hoed, and afterwards weeded by hand. Tobacco seedlings are transplanted from the nursery bed to the dry-crop field. Karela, a species of oil seed, is sown. Garden lands, in which ground-nut has been sown, are now weeded. The earth round the sugar-cane plant is dug, and heaped up over the roots, to strengthen the cane. Red pepper (mirch) is now ready and plucked from the plants.

Bhadrapud (September).§—Lands prepared for the rabi are levelled with the bakhar; joár, linseed, and kulthi are sown. The mung crop is harvested now

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* A naxtra or nakshatr is a division of time equal to 13½ days. There are 27 such in the year.

† Tabi rice is sown in December or January, and cut in May or June. Abi rice is sown in June or July, and cut in November.

* Rohini and Mirg.

† Ardra and Punarwasu.

‡ Pushya and Ashlesha.

§ Magha and Purva.

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Hyderabad.

Moulvie Mahd Ali.

(the pods being plucked from the plants), and by the end of the month some part of it is ready for the market. The ears of the bajra crop are just forming and have to be protected from birds, &c. In garden lands joár is now sown. Vegetables and edible herbs are ready for the market. The earth round the sugarcane is again dug out, and heaped up over the roots. Fields under tobacco and cotton are weeded, and also some of the garden lands. The hemp crop is ready now; the plants are uprooted and tied in bundles, to be placed in water, for the non-fibrous part to be rotted away. Fields under cotton are weeded, and in this work women are employed.

Ashvin (October).*—If the rains have not been very heavy, the rabi sowings are completed; otherwise they generally take place during the following month. Wheat and gram are now sown; the joár sowings are finished. In garden lands wheat and joár are beginning to be sown. Urd and mung are threshed, and the women are employed on this work. Grain is forming in the bajra ears, and the crop has to be watched; very often the cultivator has to sleep in his field. Where joár and vegetables have been raised in garden lands they are weeded now, and so are the fields under cotton. In garden lands wheat, gram, &c. are sown, and more of the mirch (red pepper) plucked from the plants. Vegetables are cut and sold in large quantities during this month.

Kartick (November).*—The bajra crop is now ready for the sickle, and both men and women are busily employed in gathering the harvest. At night the cultivators remain in the fields to watch the kharif crops. The first cotton is now picked, and here again women are employed. In garden lands buckwheat, gram, opium, rajura, mustard, &c. are sown.

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* Uttara and Hasta.

* Chitra, Swanti, and Vishakha.

CHAPTER I.—QUESTION 3.

Chap. I. Qn. 3.

Punjab.

Major Wac

Give any statistics you possess as to the average area in each district under cultivation yearly, distinguishing food crops from others; the average amount of the chief food grains produced per acre; the total consumption in the district of such grains; the surplus that remains for export, or the deficiency that has to be supplied by import in ordinary years. How are these statistics collected, what amount of reliance may be placed on them, and what suggestions can you make for their improvement? If you have no statistics on these subjects, give any approximation or estimate you can.

PUNJAB.

Statistics and their accuracy.—The statistics of cultivated areas published in the reports of each year are based on a very complete system of survey and registration. All the districts of the Punjab (a portion of the Kohat District alone excepted) have come under regular settlement, and the great majority of them have also been surveyed by the Revenue Survey. In the latter case the total area of the district is ascertained by scientific surveyors working with the most accurate methods known to science; and the cultivated area, as it exists at the time of survey, is also ascertained by the same agency, though by less exact methods. At the regular settlement of a district a less expensive method of survey is employed, with results which experience has shown to be, under proper supervision, scarcely less accurate (indeed as regards the exact area of cultivation, for reasons which I need not here explain, they are usually more accurate) than the returns of the scientific survey.

The object of a regular settlement is first to assess the land revenue, and secondly to provide a correct record of the land of which it is assessed and of the persons who have rights of ownership or occupancy therein. Many ends of the first importance are served by such a record; but the primary reason for its formation was the great difficulty of assessing and collecting the revenue without it.

The record is made up by villages, or rather by mauzas, of which perhaps the best translation is the word township. Each mauza, or (if they are small) each cluster of mauzas has an accountant, locally known as the Patwári, whose office is kept as far as possible hereditary, and whose business it is to report as they occur all successions and mutations which take place among the owners and tenants of his charge with a view to the record of holdings being kept up to date, and annually in October to inspect every field, noting the crops grown on it, and such mutations of ownership and occupancy as he may not already have reported. Immediately after this inspection he furnishes a statement showing the total cultivation of his charge for the kharíf just reaped and the rabi just sown.

It will be seen that this system is built up upon a reliable foundation. The total cultivated area of each mauza is ascertained at or before settlement, both by the Revenue Survey and by the settlement officers. The record of rights prepared for each village shows also the area of each field, cultivated or waste. Thus far we may be sure that errors are eliminated. The Patwári's reports each year cannot of course be so closely checked. But there is no reason to suppose that in the majority of instances they contain any very gross errors of area and classifications.

During the past 15 years great improvement has taken place in the returns of the 21 districts that have been under settlement. It is acknowledged that there is still room for improvement. But these remarks are written in order to show that there are good grounds for accepting as fairly accurate the crop areas published in the annual reports. They are not guesses. They are originally based on surveys admittedly accurate, and differ from those surveys only to the extent of the annual expansion or contraction of cultivation and variation of crops; the facts of which are ascertained annually in October by the village accountants.

Thus far as regards statistics of area and of crops cultivated. In regard to statistics of yield our position is much weaker. It may be said with truth that the very great majority of our statistics of yield are guesses. The difficulties surrounding this question even in an advanced European country are very great, and in India they are exaggerated many fold. The agriculturists keep no record of what their crops produce, and the replies of even the most intelligent and straightforward among them need to be very carefully weighed. The Financial Commissioner has found that the returns of yield of each crop reported from year to year by each district officer are not usually, in strict language, estimates of the yield for the year under report; they are approximations arrived at by the reporting officer by the use of the data of old experiments. These experiments are either those made when the district was under settlement, or others made independently by orders of the Financial Commissioner during the years 1872–75. As regards the settlement experiments Mr. Ouseley observes that their value for the purpose to which they are applied is open to question. The officers who

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Major Wace.

made them commonly mistrust the results; in practice they never assess up to the standard indicated by their produce estimates, and not uncommonly arbitrarily modify or frankly reject them. Also the small areas, usually small fractions of an acre, subjected to actual experiment, together with the limited periods over which the observations extend, greatly reduce their value as bases for generalisation. Concerning the value of the other set of experiments, those made by the order of the Financial Commissioner during the years 1872–75, Mr. Ouseley directs me to quote the remarks on the subject made by his predecessor, in forwarding them to Government for submission to the International Statistical Congress.

"As the experiments, the results of which have now been embodied, extend over a considerable period and number several thousands, the results may be considered to be fairly general in their nature. With regard to their accuracy it is necessary to remark that the facilities for supervision of such returns are limited, and that only of late have attempts been made to procure such statistics upon an extensive scale, and the subject is one which requires considerable experience on the part of those who make the observations, and a careful exclusion of all unreliable data, to an extent which the returns now furnished can hardly claim."

The last sentence expresses one of the greatest difficulties involved in the subject. And Mr. Ouseley considers that the improvement of our annual estimates of yield depends largely on our recognising this, and on the patient training of those on whom we depend for our observations.

At the same time, taking such estimates of yield as we possess for what they are worth, a table is appended showing the average produce of the principal staples of agriculture per acre, as reported by district officers for the five years ending 1876–77; and as ascertained by the Financial Commissioner's experiments during the years 1872 to 1875.

Suggestions for the improvement of existing statistics.—The Financial Commissioner considers that improvements of two kinds are possible. First, in observing actual out-turn; secondly, in the form and system of the general statistics. On the first point he considers that district officers should be urged to make independent and systematic observations. If we could succeed in observing in each district for 10 or 15 successive years the average out-turn of say 500 acres of land, selected as representing fairly the average fertility of the district; noting at the same time all the contingencies connected with its cultivation, such as expenses, losses, &c., a basis of much value would be obtained, from which to calculate the average rate of production, and the limits within which it varies. With the large revenue establishments at the disposal of Government such observations would be practicable; secondly, as to the form and system of the general statistics now annually reported, the Financial Commissioner considers them capable of material improvement in the following ways. At present the crop area of each year is ascertained by an inspection which takes place just after the kharíf has been harvested, and while the rabi is being sown; and the rabi yield is assumed as if all the field sown with the rabi came to maturity. This is a fertile source of error; many fields of wheat and barley are cut for fodder, or the seed fails to germinate; the gram crop constantly fails to a material extent; and for these and other reasons the area harvested never agrees with the area sown. Mr. Ouseley would oblige the Patwárís to inspect and record the area of each harvest at the reaping season, *i.e.*, in October for the kharíf and in April for the rabi. In the next place, the returns required from each district should be more carefully adapted to the circumstances of its agriculture. At present one uniform set of statements is required from each district, which give: 1st, a bare statement of the total acreage of each crop; 2ndly, a statement of the average yield of each crop per acre, and 3rdly, the maximum and minimum rate of rent paid by each crop. It is only in respect of the third subject that any distinction is drawn between irrigated and unirrigated land. The returns do not provide for the separate exhibition of the irrigated and unirrigated areas, and of their respective rates of yield. Only the main crops are shown, and the agriculture is very imperfectly classified. The extent to which manure is used, and its effect on the yield, is also entirely omitted.*

The omission of these details from the returns gives them an appearance of simplicity which is fallacious. The simplicity has been obtained by the excision of the most important details;—details without which they can neither be accurately compiled nor command the confidence of those who use them. It is of little use to state that wheat yields 800 lbs. per acre in one district and 600 lbs. in another, unless the proportion of crop which is irrigated in each can be stated. Situated as we are, the most important point of all is to know for each year how much of each food crop is irrigated, and how much is dependent on rain only. It is with no little difficulty and incompleteness, that an answer on this subject (see reply to question 4) could be framed, even after calling for special returns from district officers.

The Financial Commissioner does not think that the demanding of such details from district officers would necessitate the employment of more costly agency than we already possess in the village accountants and revenue establishments of the province; though it would involve an increase in special agency and the cost of supervision. Elaborate statistics are neither desirable, nor practicable; but if the returns required from each district are properly adjusted to the main features of its agriculture, it will be as easy, perhaps easier, to furnish them than the cruder returns now submitted. In brief, the annual returns required from district officers should be revised, so as to show:—

(1.) The total areas under each crop more correctly than is now done.

(2.) The area of each crop which is irrigated, aided by river floods, or solely dependent on rain; and, so far as practicable, the area manured.

(3.) The average yield of each crop under these several circumstances.

And a reasonable amount of variation should be allowed in the returns of each district; so that no one should be required to fill up tables unsuited to the agriculture which they are intended to describe, or which neglect important local specialities.

In conclusion, Mr. Ouseley would urge on the Government the creation of an appointment in the Punjab similar to that held by Mr. Buck as director of agriculture in the North-West Provinces. If the attention which Government desires its district officers to give to agriculture and its statistics is to be intelligently directed, and to achieve any results, this can only be by providing at least one officer in each province, who can give his sole attention to the supervision of the subject.

Having thus explained the nature of the statistics available, their shortcomings and the direction in which they are capable of improvement, I proceed to give the results of such statistics as have been collected in past years.

Average area in each district under cultivation.—A statement appended shows this with details of the area under each crop. The annual crop returns above described being available in the annual revenue reports; the only difficulties were to ascertain a fair average for each district, and to eliminate and correct any cases in which the returns were admittedly unreliable. To this end each district officer has been asked to state the general character of each harvest for the five years ending 1876–77; and the replies received show that the average of those five years is probably on the whole a fair one. These officers have also been asked to state whether the crop returns submitted during these five years are approximately true; the answers except in seven cases being that they are. The seven excepted cases* are those of districts under settlement; in which either the returns submitted have been estimates necessitated by the employment of the Patwárís in settlement work, or the settlement measurements have supplied more accurate data than those before available. In all seven instances the crop returns of the recent settlement measurements have been given instead of the average of the annual crop statements.

The following is a summary of the average thus obtained for the whole province; reduced to round numbers for perspicuity's sake:—

Description of Crop.	†Lakhs of Acres.			Per-centage of Total Cultivation.		
	Rabi.	Kharif.	Total.	Rabi.	Kharif.	Total.
A.—Food Grains.						
Cereals.—Wheat	64	—	—	30	—	—
Barley	17	—	—	8	—	—
Rice	—	7	—	—	3	—
Joár	—	22	—	—	10	—
Bájra	—	29	—	—	14	—
Maize	—	9	—	—	4½	—
China and Kangni	—	2	—	—	1	—
Total	81	69	150	38	32½	71
Pulses.—Gram	16½	—	—	8	—	—
Peas	1	—	—	½	—	—
Masur	1½	—	—	¾	—	—
Moth	—	11	—	—	5½	—
Másh and Mung	—	5	—	—	2½	—
Total	19	16	35	9¼	8	17¼
B.—Other Products.						
Drugs and spices	¼	1½	—	¼	¾	—
Oil seeds: Mustard	4	—	—	2	—	—
Oil seeds: Til	—	2	—	—	1	—
Oil seeds: Táràmírá	2	—	—	1	—	—
Cotton and hemp	—	8	—	—	4	—
Indigo	—	1	—	—	½	—
Sugar-cane	—	3½	—	—	1¾	—
Vegetables	1½	1	—	¾	½	—
&c.	1	—	—	½	—	—
Total (B.) other products	9	17	26	4½	8	12
Total (A.) food grains	100	85	185	47½	40	88
Grand Total	109	102	211	52	48	100

Production, consumption, and surplus or deficiency of grain.—District officers have not been asked to state the average amount of the chief food grains produced per acre, as it was considered that their annual reports for five years past supplied answers on the subject, which however defective would be less so than any hurried answers that could now be given. They have been asked to state the surplus of food grains exported from or deficiency exported into their districts. They have not been asked to furnish a complete estimate of gross production and consumption; it was considered that such estimates, if furnished, would have been unreliable; they would have been contributed by officers of varying degrees of experience, acting on conflicting rules and conclusions. But as an approximation to such an estimate, district officers were asked in replying to question 5, to state not only the staple food of the people, but also the average consumption per family. (Their answers in full on this subject will be found in the replies to that question).

Accordingly in the papers appended will be found the following returns, on which my reply to this question will be framed:—

(*a.*) A statement of average produce of principal staples of agriculture in each district, (1) as reported by district officers for the five years ending 1876–77; and (2) as ascertained by experiments conducted under the orders of the Financial Commissioner during the years 1872–75.

(*b.*) A tabular abstract of district officers replies to question 5, showing the staple food of the people, and the rate of consumption per head.

(*c.*) A statement of imports and exports of agricultural produce (external trade only) compiled from the Punjab Trade Returns of the five years, 1873-74 to 1877–78.

Some remarks are called for in connection with the two latter returns.

(*a.*) *Tabular Abstract of District Officers Replies, showing Staple Food and Rate of Consumption.*—District officers were asked to give the consumption of a family of five persons, viz., one old person, a man and his wife, and two children. In not a few instances the replies (summarised below) largely over-estimate this consumption. The most obvious cases of such over-estimating are Sirsa, a dry district, where the crops are precarious, and the poorer members of the population are often insufficiently fed; Dera Gházi Khan, where the rate given is an impossible one, and Hazára, to which the same remark applies, and where the poorer classes among the hill people certainly eat less grain than those of the plains, supplementing their meals with milk and herbs. The races of the Punjab are no doubt of larger stature than those of Southern and Eastern India; and the colder climate of this province would also cause a larger consumption of food than occurs in the rest of India. But any estimate based on an average consumption of food grains, amounting to 1 *ser* (2 lbs.) per head per diem is certainly excessive. It would be a large estimate to assume that a man and his wife in the prime of life together eat 2 *sers* per diem, and the two children with the old person will certainly on the average not eat 2 *sers*, thus giving less than 4 *sers* for five persons. The estimates submitted from each district multiplied by the population give an average for the whole province of 11⅓ *chitacks*, or 0·71 of a *ser* per head per diem. Allowing for the instances of over-estimate, the correct estimate is probably a consumption of 10 *chitacks* or 0·625 of a *ser* per head of population per diem.

TABLE showing AVERAGE DAILY CONSUMPTION per head of POPULATION per diem, in Sers and Decimals thereof; abstracted from District Officers' Reports.

Division.	District.	Average Daily Consumption per Head of Population.	
		By Agriculturists.	By Non-Agriculturists.
Delhi	Delhi	0·80	0·59
	Gurgaon	0·88	0·66
	Karnál	0·79	0·59
Hissar	Hissar	0·84	0·52
	Rohtak	0·85	0·61
	Sirsa	1·00	0·80
Umballa	Umballa	1·00	0·80
	Ludhiána	1·00	0·74
	Simla	0·79	0·59
Jullundur	Jullundur	1·05	0·80
	Hoshiárpur	0·88	0·77
	Kángra	0·78	0·66
Amritsar	Amritsar	0·71	0·57
	Siálkot	0·73	0·50
	Gurdáspur	0·82	0·66
Lahore	Lahore	0·79	0·57
	Ferozepore	1·00	0·80
	Gujránwála	0·88	0·79
Rawalpindi	Rawalpindi	1·06	0·91
	Jhelum	0·58	0·58
	Gujrát	1·04	0·67
	Shahpur	0·75	0·63
Mooltan	Mooltan	0·75	0·70
	Jhang	0·66	0·72
	Montgomery	0·77	0·62
	Muzaffargarh	0·82	0·80
Derajat	Dera Ismail Khan	1·00	0·70
	Dera Gházi Khan	1·60	1·40
	Bannu	0·75	0·64
Peshawar	Pesháwar	1·00	0·90
	Kohát	0·60	0·60
	Hazára	1·31	1·03

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* Delhi, Gurgaon, Mooltan, Jhang, Muzaffargarh, Dera Ismáil Khan, Kohát.

† Lakh = 100,000.

(*b.*) *Table of Imports and Exports for five years ending* 1877–78.—The figures are taken from the Punjab Trade Returns. They relate solely to the trade which crosses the frontiers of the province, and the results are to be relied on.

These, with the return of average areas under each crop before described, are the materials from which the estimate of production, consumption, and surplus of food grains desired by the Famine Commission must be formed. In the existing state of our statistics of average yield it is not practicable to submit with this report any such estimate for each district, or for each division; it is necessary to confine the attempt to an estimate for the whole province; an unavoidable simplification which is perhaps the less to be regretted in the case of the Punjab; as the replies to questions 2 and 16 to 21 show, that trade in past years has succeeded and will certainly in future years increasingly succeed in distributing the produce of the province according to the demand in each part of it. There is no real isolation of the several parts of the province. The estimate framed accordingly is as follows:—

ESTIMATE of FOOD GRAINS and PULSES produced, consumed, and remaining over for Storage and Export in an average Year in the PUNJAB.

	Food Grains.	PRODUCTION.			CONSUMPTION.					Surplus remaining for Storage or Export in Maunds.	Actual Exports for the 5 years ending 1877–78 in Maunds.	Difference between columns 10 and 11; *i.e.*, amount by which surplus thus estimated exceeds average actual exports from the province.	
		Average Area Cultivated in Acres.	Estimated Produce.		Population, Souls.	Consumption at 1¼ lb. or 10 Chitaks per Head of Population per Diem.	Add required for Seed Grains.		Total Consumption in Maunds.			Amount in Maunds.	Per cent. of Total Estimated Produce.
			Rate per Acre, Sers.	Total Produce, Mds.			Rate per Acre in Sers.	Amount required in Maunds.					
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
	Wheat	6,354,266	400	63,542,660	17,604,505 souls.	47,188,326	42	6,671,979	53,860,305	9,682,355	1,017,306	8,665,049	14
Inferior grains.	Barley	1,685,025	400	16,850,250		—	35	1,474,397					
	Rice	728,259	400	7,282,590		—	32	582,607					
	Jowár and bájra	5,129,248	250	32,057,800		—	5	641,156					
	Maize	921,968	300	6,914,760		—	14	322,689					
	Chiná and kangni	163,280	200	816,400		—	10	40,820					
	Total	8,627,780	296	63,921,800		37,148,256	—	3,061,669	40,209,925	23,711,875	3,499,184	24,761,619	29
Pulses	Gram	1,650,727	300	12,380,452			20	825,363					
	Others	1,887,073	200	9,435,365			8	377,415					
	Total	3,537,800	247	21,815,817		16,064,111	—	1,202,778	17,266,889	4,548,928			
	Grand Total	18,519,846	322	149,280,277		100,400,693	—	10,936,426	111,337,119	37,943,158	4,516,490*	33,426,668	22

* It is worth while noting, that the nett exports of these grains, down the Indus between the years 1861–62 and 1867–68, as registered at Mithankot, just below the junction of the Indus and Chenab, averaged only 480,242 maunds. Compare the later entries in the statement of exports appended. Exports by railway were impossible 10 years ago.

The rates of yield assumed in this estimate are the average of the rates reported by district officers for five years past; and whereas in the case of the inferior grains this could not be stated from those reports separately for each kind of grain, the average of the Financial Commissioner's experiments has been adopted. This was the only course open, as no other estimates are of a sufficiently general character. The rate of seed per acre is for the same reason taken from the Financial Commissioner's experiments. The rate of consumption assumed is 10 chitacks per head per diem, and the consumption is divided between wheat, inferior grains and pulses in the same proportion as is given in the appended tabulated statement of district officers replies, viz., wheat 47 per cent., inferior grains 37, and pulses 16. Given the produce and consumption at these rates (columns 1–9), the surplus remaining is compared in columns 10 and 11 with the nett average on rural exports. Columns 12 and 13 show the difference between this surplus and the average exports. The value of the estimate may consequently be held with fairness to depend on the possibility of giving a reasonable explanation of the discrepancy exhibited in columns 12 and 13. The details at our command limit the argument at the outside to the two heads of (1) wheat and (2) other food grains. If district officers have over-estimated the consumption of wheat relatively with other grains by even so small a proportion as 8 per cent., of the total food, the excess of wheat shown in column 12 of the estimate would disappear, and be transferred to the head of other grains. Therefore it is necessary to avoid details of kind, and to limit the argument to the total discrepancy; which is 33,426,668 maunds.

Now the estimate includes no allowance for the grain consumed by sheep, kine, camels, and horses. From data obtained from the Commissariat Departments I have ascertained that the military establishments in the Punjab (elephants, horses, mules, ponies, and bullocks) consume about 700,000 maunds of grain per annum; if we add to this the consumption of the horsed dâk lines, Government bullock trains, and the private establishments of our civil and military cantonments, we may take the total consumption on this head at 1,000,000 maunds per annum; though Mr. Ouseley thinks 900,000 maunds a safer conclusion.

There remains the grain consumed by cattle owned by the people of the country. The agriculturists do not usually feed their cattle with grain; but the townspeople do to a certain extent, especially their cows. The drivers of bullock carts always feed their cattle with two or three sers of grain when working. Bullocks, ponies, and mules are similarly fed when carrying pack loads. And there is a certain very limited consumption in feeding up cattle and sheep for slaughter. It is difficult to put the consumption under these various heads at less than 6,000,000

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maunds per annum; of which two-thirds is consumed by draught and pack cattle.*

And lastly, a certain reasonable amount should be allowed for dryage and loss in storage; say 5 per cent. of the total produce:—

	Maunds.
The surplus shown in the estimate was - -	33,426,668
Deduct on the grounds above stated,—	
(1.) Consumption of the military establishments, dák lines, and cantonments - -	1,000,000
(2.) Consumed by cattle, &c. -	6,000,000
(5.) 5 per cent. of total production for dryage and loss in storing - - -	7,464,014
Total deducted -	14,464,014

	Maunds.
So there remains over and above the estimated expenditure a balance of the estimated production amounting to maunds - - - -	18,962,654

This balance is 13 per cent., of the total estimated production: and the average estimated produce per acre of all food grains being 322 sers, or 644 lbs., this result indicates an excess estimate on the rate of production of 46 sers or 92 lbs. per acre. The estimate therefore indicates that on the whole province the average rate of production of food grains (pulses included) per acre is not more than 322 sers, and not less than 276 sers. The rate of consumption on which the lower estimate is based is certainly a moderate one. The consumption of grain by the cattle of the country is probably under-estimated; but as it is a point on which we have little information, a low estimate of it has been taken.

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* The total stock in the Punjab is,—

cows, bullocks and buffaloes - -	6,570,212
horses - - - -	84,634
ponies and mules - - -	51,895
donkeys - - -	288,118
sheep and goats - -	3,849,842
camels - - - -	165,567
carts - - - - -	97,909

STATEMENT in ACRES showing the average Area cultivated with each crop during the Five Years 1872–73 to 1876–77, compiled from Statements No. XXIX. appended to the Annual Revenue Reports for those Years.

NOTE.—The Districts marked * reported that these Returns were not reliable; and in such Districts Returns supplied from recent Settlement measurements have been substituted.

CEREALS AND PULSES USED AS FOOD.

Division.	District.	Harvest.	CEREALS.								PULSES.							TOTAL.		
			Wheat.	Jau (barley).	Rice.	Jowár (Great Millet).	Bájra (Spiked Millet).	Kangni (Italian Millet).	Makkai (Indian Corn).	China.	Gram.	Mattar (Peas).	Masúr.	Arhar.	Moth.	Másh.	Múng.	Cereals.	Pulses.	Total Food Grains.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Delhi	Delhi*	Rabi	1,26,899	66,292	—	—	—	—	—	—	72,266	1,429	100	—	—	—	—	1,93,191	73,795	2,66,986
		Kharif	—	—	11,819	1,03,115	90,320	76	8,040	266	—	—	—	290	7,215	1,213	16,063	2,13,636	24,781	2,38,417
	Gurgaon*	Rabi	75,827	1,43,837	—	—	—	—	—	—	1,14,798	280	100	—	—	—	—	2,19,664	1,15,178	3,34,842
		Kharif	—	—	809	1,58,723	2,89,962	166	627	—	—	—	—	191	1,28,253	218	19,542	4,50,287	1,48,204	5,98,491
	Karnál	Rabi	1,13,222	33,255	—	—	—	—	—	315	78,376	2	2,667	—	—	—	—	1,46,792	81,045	2,27,837
		Kharif	—	—	53,386	1,03,549	31,325	185	9,891	—	—	—	—	—	9,494	10,488	11,155	1,98,336	31,087	2,29,423
Hissar	Hissar	Rabi	41,514	36,921	—	—	—	—	—	—	61,275	—	—	—	—	—	—	78,435	61,275	1,39,710
		Kharif	—	—	10 756	2,18,853	6,92,571	—	1,325	—	—	—	—	13,300	1,95,388	19,356	76,295	9,23,505	3,04,339	12,27,844
	Rohtak	Rabi	1,16,467	70,436	—	—	—	—	—	45	1,25,256	—	400	—	—	—	—	1,86,948	1,25,656	3,12,604
		Kharif	—	—	4,080	1,88,324	1,65,491	141	559	—	—	—	—	—	23,768	10,412	19,824	3,58,595	54,004	4,12,599
	Sirsa	Rabi	43,768	81,676	—	—	—	—	—	36	31,277	279	790	—	—	—	—	1,25,480	32,346	1,57,826
		Kharif	—	—	6,982	97,732	4,50,720	11	268	20	—	46	—	—	1,59,505	629	4,596	5,55,733	1,64,776	7,20,509
Umballa	Umballa	Rabi	2,79,150	44,777	—	—	—	—	—	—	1,51,753	1,471	13,303	—	—	—	—	3,23,927	1,66,527	4,90,454
		Kharif	—	—	1,25,071	1,13,886	20,512	1,049	1,10,463	13,872	—	—	—	—	17,136	19,000	1,114	3,84,853	37,250	4,22,103
	Ludhiána	Rabi	1,88,123	65,240	—	—	—	10	—	—	1,47,728	—	3,065	—	—	—	—	2,53,373	1,50,793	4,04,166
		Kharif	—	—	3,316	1,10,756	6,308	32	56,238	159	—	—	—	—	56,493	9,130	11,641	1,76,809	77,264	2,54,073
	Simla	Rabi	3,066	1,260	—	—	—	—	—	—	8	2	21	—	—	—	—	4,326	31	4,357
		Kharif	—	—	1,109	174	149	40	1,287	923	—	8	—	—	—	165	—	3,682	173	3,855
Jullundur	Jullundur	Rabi	2,93,170	21,050	—	—	—	—	—	—	55,611	—	9,637	—	—	—	—	3,14,220	65,248	3,79,468
		Kharif	—	—	11,117	1,00,838	428	3,191	1,08,499	13,124	—	—	—	—	36,542	20,905	1,909	2,37,197	59,356	2,96,553
	Hoshiárpur	Rabi	3,30,709	37,475	—	—	—	—	—	—	53,086	1,358	21,863	—	—	—	—	3,68,184	76,307	4,44,491
		Kharif	—	—	55,996	45,797	11,969	3,186	1,01,949	7,593	—	—	—	738	28,667	23,683	5,281	2,26,490	58,369	2,84,859
	Kangra	Rabi	1,24,745	42,595	—	—	—	—	—	—	94,753	2,859	4,448	—	—	—	—	1,67,340	1,02,060	2,69,400
		Kharif	—	—	1,26,792	300	304	3,092	62,142	1,948	—	—	—	404	1,234	14,197	306	1,94,578	16,141	2,10,719
Amritsar	Amritsar	Rabi	2,60,688	37,313	—	—	—	—	—	—	89,967	—	4,296	—	—	—	—	2,98,001	94,263	3,92,264
		Kharif	—	—	23,515	70,389	12	4,045	46,876	8,312	—	—	—	—	18,491	12,418	889	1,53,149	31,798	1,84,947
	Sialkot	Rabi	3,43,718	82,412	—	—	—	—	—	—	13,356	1,711	20,139	—	—	—	—	4,26,130	35,206	4,61,336
		Kharif	—	—	81,049	55,497	4,043	8,664	42,271	1,050	—	—	—	10	12,269	10,550	1,524	1,92,574	24,353	2,16,927
	Gurdáspur	Rabi	2,05,847	1,29,682	—	—	—	—	—	—	22,533	2,806	12,671	—	—	—	—	3,35,529	38,010	3,73,539
		Kharif	—	—	79,214	38,821	10,574	6,577	38,067	1,485	—	—	—	—	17,990	16,620	1,302	1,74,738	35,912	2,10,650
Lahore	Lahore	Rabi	2,54,070	39,997	—	—	—	16	—	21	1,15,085	6	7,376	—	—	—	—	2,94,104	1,22,467	4,16,571
		Kharif	—	—	19,175	70,231	1,806	4,348	29,737	3,550	—	2	—	—	50,103	11,350	9,996	1,28,847	71,451	2,00,298
	Ferozepore	Rabi	2,07,192	1,45,050	—	—	—	—	—	45	1,48 630	571	15,400	—	—	—	—	3,52,287	1,64,601	5,16,888
		Kharif	—	—	3,947	1,95,092	65,973	1,913	34,237	4,601	—	300	—	—	86,279	24,680	26,524	3,05,763	1,37,783	4,43,546
	Gujánwála	Rabi	1,80,443	61,349	—	—	—	—	—	—	24,538	566	1,272	—	—	—	—	2,41,792	26,376	2,68,168
		Kharif	—	—	13,327	43,430	5,656	1,301	13,766	5,884	—	45	—	46	46,360	1,036	19,076	83,364	66,563	1,49,927
Rawalpindi	Rawalpindi	Rabi	3,65,797	50,321	—	—	—	—	—	—	37,729	201	2,023	—	—	—	—	4,16,118	39,953	4,56,071
		Kharif	—	—	1,129	44,569	1,68,262	2,733	44,061	—	—	—	—	—	48,187	4,558	20,036	2,60,754	72,781	3,33,535
	Jhelum	Rabi	4,13,619	36,492	—	—	—	—	—	33	27,693	114	992	—	—	—	—	4,50.144	28,799	4,78,943
		Kharif	—	—	1,760	39,987	2,01,202	192	2,920	2,342	—	5	—	—	36,056	1,763	12,208	2,48,403	50,032	2,98,435
	Gujrat	Rabi	2,40,813	67,876	—	—	—	—	—	9	28,874	311	7,873	—	—	—	—	3,09,328	37,058	3,46,386
		Kharif	—	—	28,482	55,172	1,20,802	1,130	16,476	2,127	—	—	—	—	29,292	3,512	2,150	2,24,189	34,954	2,59,143
	Shahpur	Rabi	1,57,085	11,124	—	—	—	—	—	2,308	11,884	158	613	—	—	—	—	1,70,517	12,655	1,83,172
		Kharif	—	—	890	18,785	74,660	426	911	1,595	—	3	—	—	7,614	244	1,532	97,267	9,393	1,06,660
Mooltan	Mooltán*	Rabi	2,47,917	4,578	—	—	—	—	—	115	14,883	27,010	1,145	—	—	—	—	2,52,610	43,038	2,95,648
		Kharif	—	—	8,827	64,658	11,469	994	163	2,958	—	—	—	—	271	1,557	216	89,069	2,044	91,113
	Jhang*	Rabi	1,75,493	6,188	—	—	—	—	—	—	13,969	8,487	2,435	—	—	—	—	1,81,681	24,891	2,06,572
		Kharif	—	—	150	38,004	1,829	852	2,259	4,374	—	—	—	—	403	9,173	551	47,468	10,127	57,595
	Montgomery*	Rabi	2,00,043	31,158	—	—	—	3	—	285	30,080	9,358	5,370	331	92	—	—	2,31,489	45,231	2,76,720
		Kharif	—	—	10,611	29,222	246	7,994	1,889	2,967	—	—	—	274	2,457	4,849	2,572	52,929	10,152	63,081
	Muzaffargarh*	Rabi	2,03,215	10,099	—	—	—	—	—	—	12,786	24,926	4,477	—	—	—	—	2,13,314	42,189	2,55,503
		Kharif	—	—	10,353	21,545	18,241	285	—	1,266	—	—	—	—	3,959	345	208	51,690	4,512	56,202

STATEMENT in ACRES showing the Average Area cultivated with each Crop—*continued.*

NOTE.—The Districts marked * reported that these Returns were not reliable; and in such Districts Returns supplied from recent Settlement measurements have been substituted.

OTHER PRODUCTS.

Division.	District.	Harvest.	DRUGS AND SPICES.							OIL SEEDS.				FIBRES.		DYES.		Vegetables.	Tea.	Sugar-cane.	Total other Products.	Grand Total Products.
0.	0.	0.	Poppy. 22.	Tobacco. 23.	Tumeric. 24.	Coriander Seed. 25.	Ginger. 26.	Chilies. 27.	Other kinds. 28.	Linseed. 29.	Sarso (Mustard). 30.	Til (Seasamum). 31.	Táramira (Spinapis erucea). 32.	Cotton. 33.	Hemp. 34.	Kasumbha (Shafflower). 35.	Indigo. 36.	37.	38.	39.	40.	41.
Delhi	Delhi*	Rabi	—	1,286	—	492	—	—	—	—	419	—	2,756	—	—	—	—	2,155	—	—	7,108	2,74,094
		Kharif	—	—	—	—	—	1,578	—	—	—	20	—	28,835	155	—	288	655	—	30,782	62,313	3,00,730
	Gurgaon*	Rabi	—	1,210	—	11	—	—	1,289	—	3,733	—	1,551	—	—	—	—	3,688	—	—	11,482	3,46,324
		Kharif	—	—	—	—	—	89	—	—	—	51	—	76,341	81	—	81	915	—	414	77,972	6,76,463
	Karnál	Rabi	63	1,584	—	24	—	19	2,686	103	8,410	—	37	—	—	400	—	982	—	—	14,308	2,42,145
		Kharif	135	—	—	—	—	465	1,954	—	—	2,093	220	24,188	1,152	—	410	800	—	13,730	45,147	2,74,570
Hissar	Hissar	Rabi	—	3,062	17	3,127	—	—	1,237	—	11,227	—	—	—	—	947	—	1,120	—	—	20,737	1,60,447
		Kharif	—	—	—	—	—	2,305	14	—	—	13,798	—	22,879	2,963	—	604	2,060	—	56	44,679	12,72,523
	Rohtak	Rabi	—	3,453	—	54	—	79	952	—	10,954	—	654	—	—	241	—	1,413	—	—	17,791	3,30,395
		Kharif	—	—	—	—	—	8	3,387	—	—	12,782	—	45,652	5,259	—	2,259	1,169	—	27,491	98,007	5,10,606
	Sirsa	Rabi	7	385	—	—	—	13	554	—	14,807	—	766	—	—	3	—	745	—	4	17,284	1,75,110
		Kharif	—	—	—	—	—	33	27	—	—	47,181	—	159	12	—	—	266	—	4	47,682	7,68,191
Umballa	Umballa	Rabi	2,306	3,480	—	91	—	2	834	2,190	19,369	—	4,647	—	—	7,648	58	2,811	—	—	43,436	5,33,890
		Kharif	—	—	—	—	86	917	1,662	—	—	2,716	—	35,987	2,123	—	1,287	1,798	—	25,036	71,414	4,93,517
	Ludhiána	Rabi	304	1,921	—	84	—	17	167	270	13,539	—	869	—	355	7	1	6,720	—	—	24,254	4,28,420
		Kharif	—	—	—	—	—	52	303	—	—	642	—	13,138	1,457	—	2,587	13,446	—	11,016	42,641	2,96,714
	Simla	Rabi	299	19	—	1	—	—	—	—	11	—	—	—	—	4	—	6	29	—	369	4,726
		Kharif	—	1	43	4	374	—	160	—	—	4	—	18	—	—	—	5	—	—	609	4,464
Jullundur	Jullundur	Rabi	641	3,423	—	46	—	—	1,275	217	7,320	—	859	—	—	195	—	5,231	—	—	19,207	3,98,675
		Kharif	—	—	15	—	—	739	8,329	—	—	2,147	—	26,294	4,090	—	1,939	2,233	—	36,378	82,164	3,78,717
	Hoshárpur	Rabi	233	4,888	4	246	17	—	42	2,116	15,531	1,800	5,063	—	341	11,017	127	1,419	—	—	42,916	4,87,407
		Kharif	—	—	12	—	—	189	61	—	—	2,478	1,241	25,465	5,788	—	845	1,937	—	40,598	78,604	3,63,463
	Kángra	Rabi	944	1,015	—	114	—	64	393	3,715	5,222	—	183	—	—	817	—	848	7,235	—	20,550	2,89,950
		Kharif	—	—	1,585	—	110	120	488	—	—	5,073	—	6,284	4,200	—	—	3,216	—	7,446	28,522	2,39,241
Amritsar	Amritsar	Rabi	1,116	2,982	—	6	—	—	4,489	539	23,951	—	633	—	—	383	—	7,512	—	—	41,611	4,33,875
		Kharif	—	—	—	45	2	666	872	—	—	1,425	22	26,052	1,176	—	—	3,912	—	30,247	63,919	2,48,866
	Siálkot	Rabi	465	4,898	—	139	—	—	3,143	4,263	7,475	—	1,600	—	—	197	—	5,654	—	—	27,834	4,89,170
		Kharif	—	117	222	—	—	1,545	2,861	—	1,993	7,013	—	34,137	2,071	—	—	5,923	—	41,648	97,530	3,14,457
	Gurdáspur	Rabi	248	5,000	27	561	—	—	3,352	5,738	6,521	—	2,248	—	—	385	—	2,189	—	—	26,269	3,99,808
		Kharif	—	542	684	—	—	3,076	89	—	987	8,590	—	18,197	3,104	—	—	2,998	—	31,313	69,580	2,80,230
Lahore	Lahore	Rabi	935	2,745	—	166	—	—	10,601	4	32,722	—	3,782	—	—	—	—	3,796	—	—	54,751	4,71,322
		Kharif	—	—	—	8	—	1,178	2,190	—	—	5,594	333	30,506	493	—	—	1,022	—	2,432	43,756	2,44,054
	Ferozepore	Rabi	305	4,639	—	729	—	—	7,161	4	38,668	—	6,084	—	—	3	—	1,852	—	—	59,445	5,76,333
		Kharif	—	—	—	—	—	1,949	5,827	—	—	8,786	—	7,392	2,010	—	6	1,444	—	616	28,030	4,71,576
	Gujránwála	Rabi	184	4,552	—	75	—	51	2,160	273	3,271	—	1,269	—	—	20	—	15,024	—	—	26,879	2,95,047
		Kharif	—	—	—	—	—	172	346	—	10,871	2,759	—	36,740	714	—	—	27,214	—	26,096	1,04,912	2,54,839
Rawalpindi	Rawalpindi	Rabi	33	705	1	29	—	—	48	14	29,420	—	40,454	—	—	228	—	3,835	—	—	74,267	5,30,338
		Kharif	—	833	1	—	—	111	27	1	—	1,621	—	32,421	730	—	16	2,177	241	1,403	39,582	3,73,117
	Jhelum	Rabi	62	826	—	19	—	1	1,433	355	11,461	—	40,198	—	—	98	—	2,096	—	—	56,549	5,35,492
		Kharif	—	—	—	—	—	259	1,781	—	—	1,035	—	24,359	725	—	—	965	—	276	29,400	3,27,835
	Gujrat	Rabi	260	2,862	—	429	—	—	6,378	2,081	14,532	—	25,418	—	6	2,313	—	13,616	—	—	67,895	4,14,281
		Kharif	—	—	—	—	—	284	2,033	—	6,226	9,245	—	23,732	3,972	—	94	7,848	—	6,827	60,261	3,19,404
	Shahpur	Rabi	1,659	911	—	12	—	—	24	28	164	—	1,732	—	—	—	—	13,992	—	—	18,522	2,01,694
		Kharif	—	—	—	—	—	—	—	—	—	2,158	—	24,491	10	—	—	1,745	—	878	29,282	1,35,942
Mooltan	Mooltan*	Rabi	—	1,302	—	—	—	—	—	—	—	—	6,151	—	—	—	—	40,517	—	—	47,970	3,43,618
		Kharif	—	—	—	—	—	—	—	—	—	9,775	—	36,095	10	83	50,746	272	—	3,672	1,00,653	1,91,766
	Jhang*	Rabi	13	987	—	—	—	—	—	—	204	—	390	—	—	1	—	18,256	—	—	19,852	2,26,424
		Kharif	—	—	—	—	—	—	1	—	—	3,191	—	28,443	—	—	11	10,056	—	209	41,910	99,505
	Montgomery	Rabi	111	1,343	—	238	—	—	—	—	10,929	—	9	—	1	2	—	1,398	—	—	16,352	2,93,072
		Kharif	—	—	—	—	—	111	2,821	—	2	9,654	183	18,243	140	—	7	1,004	—	242	29,795	92,876
	Muzaffargarh*	Rabi	61	1,122	—	12	—	—	209	1	13,417	—	8,244	—	—	88	—	1,031	—	—	25,849	2,81,352
		Kharif	—	—	—	—	—	149	1,873	—	—	4,220	—	29,582	1	—	20,658	160	—	4,280	59,050	1,15,252

STATEMENT in ACRES showing the Average Area cultivated with each Crop—*continued.*

NOTE.—The Districts marked * reported that these Returns were not reliable, and in such Districts Returns supplied from recent Settlement measurements have been substituted.

CEREALS AND PULSES USED AS FOOD.

			CEREALS.								PULSES.							TOTAL.		
Division.	District.	Harvest.	Wheat.	Jau (Barley).	Rice.	Jowár (Great Millet).	Bájra (Spiked Millet).	Kangni (Italian Millet).	Makkai (Indian Corn).	China.	Gram.	Mattar (Peas).	Masur.	Arhar.	Moth.	Másh.	Múng.	Cereals.	Pulses.	Total Food Grains.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Derajat	Dera Ismail Khan*	Rabi	3,19,502	14,907	—	—	—	—	—	—	18,084	17,162	1,620	—	—	—	—	3,34,409	36,866	3,71,275
		Kharif	—	—	1,970	25,917	2,62,908	1,816	139	92	—	—	—	—	724	50	2,576	2,92,837	3,350	2,96,187
	Dera Ghází Khan	Rabi	1,26,340	11,228	—	—	—	16	—	11	2,452	6,256	5,231	1	—	155	—	1,37,595	14,095	1,51,690
		Kharif	—	—	11,073	93,616	31,767	99	61	60	—	—	—	—	230	372	144	1,36,676	746	1,37,422
	Bannu	Rabi	2,34,572	28,599	—	—	—	—	—	—	48,895	6,918	5,172	—	—	—	—	2,63,171	60,985	3,24,156
		Kharif	—	—	334	11,641	89,228	—	24,045	—	—	—	—	—	4,764	3,063	3,742	1,25,248	11,569	1,36,817
Peshawar	Pesháwar	Rabi	2,90,552	2,12,280	—	—	—	8	—	—	189	138	1,648	88	—	—	—	5,02,840	2,063	5,04,903
		Kharif	—	—	10,329	62,853	2,327	1,611	59,827	34	—	—	—	433	16,555	3,257	3,429	1,36,981	23,674	1,60,655
	Kohát*	Rabi	97,533	10,014	—	—	—	—	—	—	1,984	—	—	—	—	—	—	1,07,547	1,984	1,09,531
		Kharif	—	—	2,361	2,213	47,342	2,106	12,920	—	—	—	—	—	6,327	4	11,473	66,942	17,804	84,746
	Hazara	Rabi	93,167	49,544	—	—	—	—	—	—	929	234	1,078	—	—	—	—	1,42,711	2,241	1,44,952
		Kharif	—	—	8,530	1,148	26,010	20,515	90,055	2	—	1,434	—	—	10,812	2,436	5,144	1,46,260	19,826	1,66,086
	Grand Total	Rabi	63,54,266	16,85,025	—	—	—	53	—	5,853	16,50,727	1,14,613	1,57,225	420	92	155	—	80,43,197	19,23,232	99,66,429
		Kharif	—	—	7,28,259	22,24,837	29,04,411	78,770	9,21,968	80,604	—	1,843	—	15,686	10,62,838	2,41,183	2,93,018	69,38,849	16,14,568	85,53,417

TOTAL OF EACH DIVISION.

		4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Delhi	Rabi	3,15,948	2,43,384	—	—	—	—	—	315	2,65,440	1,711	2,867	—	—	—	—	5,59,647	2,70,018	8,29,665
	Kharif	—	—	66,014	3,65,387	4,11,607	427	18,558	266	—	—	—	481	1,44,962	11,869	46,760	8,62,259	2,04,072	10,66,331
Hissar	Rabi	2,01,749	1,89,033	—	—	—	—	—	81	2,17,808	279	1,190	—	—	—	—	3,90,863	2,19,277	6,10,140
	Kharif	—	—	21,818	5,04,909	13,08,782	152	2,152	20	—	46	—	13,800	3,78,661	30,397	1,00,715	18,37,833	5,23,119	23,60,952
Umballa	Rabi	4,70,339	1,11,277	—	—	—	10	—	—	2,99,489	1,473	16,389	—	—	—	—	5,81,626	3,17,351	8,98,977
	Kharif	—	—	1,29,496	2,24,816	26,969	1,121	1,67,988	14,954	—	8	—	—	73,629	28,295	12,755	5,65,344	1,14,687	6,80,031
Jullundur	Rabi	7,48,624	1,01,120	—	—	—	—	—	—	2,03,450	4,217	35,948	—	—	—	—	8,49,744	2,43,615	10,93,359
	Kharif	—	—	1,93,905	1,46,935	12,701	9,469	2,72,590	22,665	—	—	—	1,142	66,443	58,785	7,496	6,58,265	1,33,866	7,92,131
Amritsar	Rabi	8,10,253	2,49,407	—	—	—	—	—	—	1,25,856	4,517	37,106	—	—	—	—	10,59,660	1,67,479	12,27,139
	Kharif	—	—	1,83,778	1,64,707	14,629	19,286	1,27,214	10,847	—	—	—	10	48,750	39,588	3,715	5,20,461	92,063	6,12,524
Lahore	Rabi	6,41,705	2,46,396	—	—	—	16	—	66	2,88,253	1,143	24,048	—	—	—	—	8,88,183	3,13,444	12,01,627
	Kharif	—	—	36,449	3,08,753	73,435	7,562	77,740	14,035	—	347	—	46	1,82,742	37,066	55,596	5,17,974	2,75,797	7,93,771
Rawalpindi	Rabi	11,77,314	1,65,813	—	—	—	—	—	2,980	1,06,180	784	11,501	—	—	—	—	13,46,107	1,18,465	14,64,572
	Kharif	—	—	32,261	1,58,513	5,64,926	4,481	64,368	6,064	—	8	—	—	1,21,149	10,077	35,926	8,30,613	1,67,160	9,97,773
Mooltan	Rabi	82,668	52,023	—	—	—	3	—	400	71,718	69,781	13,427	331	92	—	—	8,79,094	1,55,349	10,34,443
	Kharif	—	—	29,941	1,53,429	31,785	10,125	4,311	11,565	—	—	—	274	7,090	15,924	3,547	2,41,156	26,835	2,67,991
Derajat	Rabi	6,80,414	54,734	—	—	—	16	—	11	69,431	30,336	12,023	1	—	155	—	7,35,175	1,11,946	8,47,121
	Kharif	—	—	13,377	1,31,174	3,83,898	1,915	24,245	152	—	—	—	—	5,718	3,845	6,462	5,54,761	15,665	5,70,426
Pesháwar	Rabi	4,81,252	2,71,838	—	—	—	8	—	—	3,102	372	2,726	88	—	—	—	7,53,098	6,288	7,59,386
	Kharif	—	—	21,220	66,214	75,679	24,232	1,62,802	36	—	1,434	—	433	83,694	5,697	20,046	3,50,183	61,304	4,11,487
Total	Rabi	63,54,266	16,85,025	—	—	—	53	—	5,853	16,50,727	1,14,613	1,57,225	420	92	155	—	80,43,197	19,23,232	99,66,429
	Kharif	—	—	7,28,259	22,24,837	29,04,411	78,770	9,21,968	80,604	—	1,843	—	15,686	10,62,838	2,41,183	2,93,018	69,38,849	16,14,568	85,53,417

STATEMENT in ACRES showing the Average Area cultivated with each Crop—*continued.*

NOTE.—The Districts marked * reported that these Returns were not reliable; and in such Districts Returns supplied from recent Settlement measurements have been substituted.

OTHER PRODUCTS.

Division.	District.	Harvest.	DRUGS AND SPICES.							OIL SEEDS.				FIBRES.		DYES.						
			Poppy.	Tobacco.	Turmeric.	Coriander Seed.	Ginger.	Chillies.	Other kinds.	Linseed.	Sarso (Mustard).	Til (Seasamum).	Táramíra (Spinapis ernea).	Cotton.	Hemp.	Kasumbha (Shaf-flower).	Indigo.	Vegetables.	Tea.	Sugar-cane.	Total of the Products.	Grand Total Products.
0.	0.	0.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.	41.
Derajat	Dera Ismail Khan*	Rabi	—	666	—	5	—	—	—	19	57,459	—	24,286	—	—	65	—	1,218	—	—	83,718	4,54,993
		Kharif	—	—	—	—	—	—	50	—	—	2,037	—	33,392	—	—	—	2,043	—	76	37,598	3,33,785
	Derá Ghází Khan	Rabi	531	1,843	—	14	—	—	140	3	8,240	—	10,656	—	—	32	—	576	—	—	22,035	1,73,725
		Kharif	—	—	—	—	—	74	32	—	—	494	—	23,095	—	—	19,603	563	—	23	43,884	1,81,306
	Bannu	Rabi	14	694	86	9	—	—	223	1	177	—	3,498	—	—	—	—	1,233	—	—	5,935	3,30,091
		Kharif	—	—	85	—	—	192	479	—	—	621	—	9,334	—	—	—	1,255	—	4,224	16,190	1,53,007
Peshawar	Pesháwar	Rabi	46	1,281	23	21	—	19	5	—	22,551	—	757	—	—	—	—	2,338	—	—	27,041	5,31,944
		Kharif	—	244	—	—	—	9	690	—	—	5,189	—	17,456	22	7	23	2,109	360	8,301	34,410	1,95,065
	Kohat*	Rabi	—	3,307	—	—	—	—	—	—	62	—	494	—	—	—	—	519	—	—	4,382	1,13,913
		Kharif	—	—	—	—	—	—	—	—	—	4,792	—	6,896	—	—	—	80	—	20	11,288	96,034
	Hazára	Rabi	67	1,570	—	5	—	—	469	—	8,062	—	214	—	—	—	—	197	—	—	10,584	1,55,536
		Kharif	—	—	703	—	—	10	5	—	21	2,436	—	10,912	3	—	—	150	—	404	14,644	1,80,730
	Grand Total	Rabi	10,907	69,961	158	6,759	17	256	53,250	21,934	3,99,828	1,800	1,95,502	—	703	25,094	186	1,63,559	7,264	4	9,57,182	1,09,23,611
		Kharif	135	1,737	3,350	57	572	16,082	33,376	1	20,100	1,79,620	1,999	7,76,265	42,461	90	1,01,464	1,01,440	601	3,56,138	16,35,428	1,01,88,845

TOTAL OF EACH DIVISION.

Division.	District.	Harvest.	Poppy.	Tobacco.	Turmeric.	Coriander Seed.	Ginger.	Chillies.	Other kinds.	Linseed.	Sarso (Mustard).	Til (Seasamum).	Táramíra (Spinapis ernea).	Cotton.	Hemp.	Kasumbha (Shaf-flower).	Indigo.	Vegetables.	Tea.	Sugar-cane.	Total of the Products.	Grand Total Products.
Delhi		Rabi	63	4,080	—	527	—	19	3,975	103	12,562	—	4,344	—	—	400	—	6,825	—	—	32,898	8,62,563
		Kharif	135	—	—	—	—	2,132	1,954	—	—	2,164	220	1,29,364	1,388	—	779	2,370	—	44,926	1,85,432	12,51,763
Hissar		Rabi	7	6,900	17	3,181	—	83	2,743	—	36,988	—	1,420	—	—	1,191	—	3,278	—	4	55,812	6,65,952
		Kharif	—	—	—	—	—	2,346	3,428	—	—	73,761	—	68,690	8,234	—	2,863	3,495	—	27,551	1,90,368	25,51,320
Umballa		Rabi	2,909	5,420	—	176	—	19	1,001	2,460	32,919	—	5,516	—	355	7,659	59	9,537	29	—	68,059	9,67,036
		Kharif	—	1	43	4	460	771	2,125	—	—	3,362	—	49,143	3,580	—	3,874	15,249	—	36,052	1,14,664	7,94,695
Jullundur		Rabi	1,818	9,326	4	406	17	64	1,710	6,048	28,073	1,800	6,105	—	341	12,029	127	7,570	7,235	—	82,673	11,76,032
		Kharif	—	—	1,612	—	110	1,048	8,878	—	—	9,698	1,241	58,033	14,078	—	2,784	7,386	—	84,422	1,89,290	9,81,421
Amritsar		Rabi	1,829	12,880	27	706	—	—	10,984	10,540	37,947	—	4,481	—	—	965	—	15,355	—	—	95,714	13,22,853
		Kharif	—	659	906	45	2	5,287	3,322	—	2,980	17,028	22	78,386	6,351	—	—	12,833	—	1,03,208	2,31,029	8,43,553
Lahore		Rabi	1,424	11,936	—	970	—	51	19,922	281	74,661	—	11,135	—	—	23	—	20,672	—	—	1,41,075	13,42,702
		Kharif	—	—	—	8	—	3,299	8,363	—	10,871	17,139	333	74,638	3,217	—	6	29,680	—	29,144	1,76,698	9,70,469
Rawalpindi		Rabi	2,014	5,304	1	489	—	1	7,883	2,478	55,577	—	1,07,802	—	6	2,639	—	33,039	—	—	2,17,238	16,81,805
		Kharif	—	833	1	—	—	654	3,841	1	6,226	14,059	—	1,05,603	5,437	—	110	12,735	241	9,384	1,58,525	11,56,298
Mooltan		Rabi	185	4,754	—	250	—	—	4,195	1	24,550	—	14,794	—	1	91	—	61,202	—	—	1,10,023	11,44,466
		Kharif	—	—	—	—	—	260	209	—	2	26,840	183	1,12,363	151	83	71,422	11,492	—	8,403	2,31,408	4,99,399
Derajat		Rabi	545	3,203	86	28	—	—	363	23	65,876	—	38,440	—	—	97	—	3,027	—	—	1,11,688	9,58,809
		Kharif	—	—	85	—	—	266	561	—	—	3,152	—	65,821	—	—	19,603	3,861	—	4,323	97,672	6,68,098
Pesháwar		Rabi	113	6,158	23	26	—	19	474	—	30,675	—	1,465	—	—	—	—	3,054	—	—	42,007	8,01,893
		Kharif	—	244	703	—	—	19	695	—	21	12,417	—	34,764	25	7	23	2,339	360	8,725	60,342	4,71,829
	Total	Rabi	10,907	69,961	158	6,759	17	256	53,250	21,934	3,99,828	1,800	1,95,502	—	703	25,094	186	1,63,559	7,264	—	9,57,182	1,09,23,611
		Kharif	135	1,737	3,350	57	572	16,082	33,376	1	20,100	1,70,620	1,999	7,76,205	42,461	90	1,01,464	1,01,440	601	3,56,138	16,35,428	1,01,88,845

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PUNJAB.

ajor Ware.

ABSTRACT IN ACRES.

DIVISION.	Harvest.	Cereals.	Pulses.	Total.	Other. Products.	GRAND TOTAL.	
						Harvests.	Total.
Delhi	Rabi	5,59,647	2,70,018	8,29,665	32,898	8,62,563	21,14,326
	Kharíf	8,62,259	2,04,072	10,66,331	1,85,432	12,51,763	
Hissar	Rabi	3,90,863	2,19,277	6,10,140	55,812	6,65,952	32,17,272
	Kharíf	18,37,833	5,23,119	23,60,952	1,90,368	25,51,320	
Umballa	Rabi	5,81,626	3,17,351	8,98,977	68,059	9,67,036	17,61,731
	Kharíf	5,65,344	1,14,687	6,80,031	1,14,664	7,94,695	
Jullundur	Rabi	8,49,744	2,43,615	10,93,359	82,673	11,76,032	21,57,453
	Kharíf	6,58,256	1,33,866	7,92,131	1,89,290	9,81,421	
Amritsar	Rabi	10,59,660	1,67,479	12,27,139	95,714	13,22,853	21,66,406
	Kharíf	5,20,461	92,063	6,12,524	2,31,029	8,43,553	
Lahore	Rabi	8,88,183	3,13,444	12,01,627	1,41,075	13,42,702	23,13,171
	Kharíf	5,17,974	2,75,797	7,93,771	1,76,698	9,70,469	
Rawalpindi	Rabi	13,46,107	1,18,465	14,64,572	2,17,233	16,81,805	28,38,103
	Kharíf	8,30,613	1,67,160	9,97,773	1,58,525	11,56,298	
Mooltan	Rabi	8,79,094	1,55,349	10,34,443	1,10,023	11,44,466	16,43,865
	Kharíf	2,41,156	26,835	2,67,991	2,31,408	4,99,399	
Derajat	Rabi	7,35,175	1,11,946	8,47,121	1,11,688	9,58,809	16,26,907
	Kharíf	5,54,761	15,665	5,70,426	97,672	6,68,098	
Peshawar	Rabi	7,53,098	6,288	7,59,386	42,007	8,01,393	12,73,222
	Kharíf	3,50,183	61,304	4,11,487	60,342	4,71,829	
Grand Total	Rabi	80,43,197	19,23,232	99,66,429	9,57,182	1,09,23,611	2,11,12,456
	Kharíf	69,38,849	16,14,568	85,53,417	16,35,428	1,01,88,845	

ABSTRACT IN PER-CENTAGE.

DIVISION.	Harvest.	Cereals.	Pulses.	Total.	Other. Products.	Total.	REMARKS.
Delhi	Rabi	26	13	39	1	40	100
	Kharíf	41	10	51	9	60	
Hissar	Rabi	12	7	19	2	21	100
	Kharíf	57	16	73	6	79	
Umballa	Rabi	33	18	51	4	55	100
	Kharíf	32	7	39	6	45	
Jullundur	Rabi	40	11	51	4	55	100
	Kharíf	30	6	36	9	45	
Amritsar	Rabi	49	8	57	4	61	100
	Kharíf	24	4	28	11	39	
Lahore	Rabi	39	13	52	6	58	100
	Kharíf	22	12	34	8	42	
Rawalpindi	Rabi	47	4	51	8	59	100
	Kharíf	29	5	34	7	41	
Mooltan	Rabi	53	9	62	7	69	100
	Kharíf	15	2	17	14	31	
Derajat	Rabi	45	7	52	7	59	100
	Kharíf	34	1	35	6	41	
Peshawar	Rabi	59	1	60	3	63	100
	Kharíf	27	5	32	5	37	
Total	Rabi	38	9	47	4	51	100
	Kharíf	33	8	41	8	49	

AVERAGE PRODUCE OF PRINCIPAL STAPLES OF AGRICULTURE IN THE PUNJAB.

Crop.	Period.	Produce per Acre in Lbs.	Authority.
Wheat	1872–77	826	District reports.
„	1872–75	884	Financial Commissioner's experiments.
Rice	1872–77	869	District reports.
„	1872–75	854	Financial Commissioner's experiments.
Inferior Grains :	1872–77	665	District reports.
Barley	1872–75	1,015	Financial Commissioner's experiments.
Joár	„	610	„ „ „
Bajra	„	477	„ „ „
Maize	„	598	„ „ „
Kangni	„	447	„ „ „
China	„	458	„ „ „
Peas	„	493	„ „ „
Masur	„	224	„ „ „
Moth	„	393	„ „ „
Mash	„	418	„ „ „
Mung	„	412	„ „ „
Gram	1872–77	756	District reports.
„	1872–75	253	Financial Commissioner's experiments.
Oil Seeds :	1872–77	421	District reports.
Rape or Mustard	1872–75	458	Financial Commissioner's experiments.
Linseed	„	372	„ „ „
Til	„	274	„ „ „
Taramira	„	313	„ „ „
Cotton	1872–77	107	District reports.
„	1872–75	363	Financial Commissioner's experiments.

STATEMENT of IMPORTS and EXPORTS of FOOD GRAINS, OIL SEEDS, and BUTTER (GHI), compiled from the PUNJAB TRADE RETURNS commencing 1869-70 and ending 1877-78.

Explanation.—The North Frontier trade is with Bajaur (North of Peshâwar) and with Kashmir and Central Asia North thereof.
The West Frontier trade is with Afghanistan.
The South Frontier trade is with Sindh, Bahâwalpur, Bikâner, and Jaipûr. Nearly all the river trade is with Sindh.
The East Frontier trade is with the North-Western Provinces and other British Provinces supplied through them. The Railway exports to Calcutta and Bombay for Europe are consequently included under this head

Across what Frontier.	WHEAT.		OTHER FOOD GRAINS.		GHI.		OIL SEEDS.		OIL.		TOTAL.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
						1873–74						
North Frontier—By native carriage	—	—	26,803	10,653	20,963	21	5,074	69	25	—	52,865	10,743
West Frontier—By native carriage	—	—	901	126	2,670	—	—	—	—	—	3,571	126
South Frontier: By native land carriage	—	—	36,095	4,05,142	3,621	1,419	4,606	13,038	—	4,045	44,322	4,23,644
South Frontier: By native boats on the Indus	—	—	49,269	6,51,678	42	7,147	15	1,80,747	2,510	209	51,836	8,39,781
South Frontier: By Steam Flotilla on the Chenab and Indus.	—	—	Not shown		Not shown		Not shown		Not shown		Not shown	
Total	—	—	85,364	10,56,820	3,663	8,566	4,621	1,93,785	2,510	4,254	96,158	12,63,425
East Frontier: By native land carriage	—	—	2,04,500	14,38,359	770	365	13,471	85,776	310	1,565	2,19,051	15,26,065
East Frontier: By Sind, Punjab, and Delhi Railway.	Page 10 of Report.	5,94,788	Page 10 of Report.	27,01,990	Not shown		Not shown		Not shown		—	32,96,778
East Frontier: By East Indian State Railway	—	—	29,483	11,67,512	21,019	746	25,316	1,01,660	—	—	75,818	12,69,918
Total	—	5,94,788	2,33,983	53,07,861	21,789	1,111	38,787	1,87,436	310	1,565	2,94,869	60,92,761
Grand Total	—	5,94,788	3,47,051	63,75,460	49,085	9,698	48,482	3,81,290	2,845	5,819	4,47,463	73,67,055
						1874–75						
North Frontier—By native carriage	20,900	98,059	46,016	55,548	36,093	3,400	7,882	962	1,468	725	1,12,359	1,58,694
West Frontier—By native carriage	73,438	39,079	15,521	19,387	3,952	13	149	—	1,031	860	94,091	59,339
South Frontier: By native land carriage	78,121	1,69,854	1,93,702	6,15,590	6,445	4,821	39,515	38,563	2,034	10,053	3,19,817	8,38,881
South Frontier: By native boats on the Indus	140	2,86,993	13,770	2,18,196	—	2,896	—	2,06,792	4,012	11,732	17,922	7,26,609
South Frontier: By Steam Flotilla on the Chenab and Indus.	Not shown		Not shown		Not shown		Not shown		Not shown		Not shown	
Total	78,261	4,56,847	2,07,472	8,33,786	6,445	7,717	39,515	2,45,355	6,046	21,785	3,37,739	15,65,490
East Frontier: By native land carriage	4,03,468	10,73,869	1,73,672	3,79,350	2,325	8,302	10,692	34,296	2,284	4,796	5,92,441	15,00,613
East Frontier: By Sind, Punjab, and Delhi Railway.	6,109	7,28,512	68,153	20,10,449	571	72	2,929	47,007	4,245	19,774	82,007	28,05,814
East Frontier: By East Indian State Railway	73,674	2,49,523	—	—	30,352	508	—	—	—	—	1,04,026	2,50,031
Total	4,83,251	20,51,904	2,41,825	23,89,799	33,248	8,882	13,621	81,303	6,529	24,570	7,78,474	45,56,458
Grand Total	6,55,850	26,45,889	5,10,834	32,98,520	79,738	20,012	61,167	3,27,620	15,074	47,940	13,22,663	63,39,981

						1875–76							
North Frontier—By native carriage		37,303	90,579	64,723	83,402	42,616	3	11,153	1,622	3,618	2,079	1,59,413	1,77,685
West Frontier—By native carriage		19,643	37,084	7,002	38,970	5,390	2	286	125	53	762	32,374	76,943
South Frontier	By native land carriage	30,036	1,53,801	2,46,889	3,46,190	3,987	3,382	79,016	48,680	36,549	4,853	3,96,477	5,56,906
	By native boats on the Indus	—	4,22,267	3,683	1,82,879	5	2,920	—	2,99,628	509	739	4,197	9,08,433
	By Steam Flotilla on the Chenab and Indus.	—	2	1,041	3,517	2	114	—	3,25,537	3,171	24	4,214	3,29,194
Total		30,036	5,76,070	2,51,613	5,32,586	3,994	6,416	79,016	6,73,845	40,229	5,616	4,04,888	17,94,533
East Frontier	By native land carriage	3,67,593	12,130	1,10,390	1,55,219	906	6,194	4,584	67,801	726	3,310	4,84,199	2,44,654
	By Sind, Punjab, and Delhi Railway.	37,740	4,175	2,06,686	2,10,150	495	77	1,147	60,592	5,833	44,763	2,51,901	3,19,757
	By East India State Railway	3,38,339	20,539	—	—	15,581	258	25,906	16,882	1,144	1,360	3,80,970	39,039
Total		7,43,672	36,844	3,17,076	3,65,369	16,982	6,529	31,637	1,45,275	7,703	49,433	11,17,070	6,03,450
Grand Total		8,30,654	7,40,577	6,40,414	10,20,327	68,982	12,950	1,22,092	8,20,867	51,603	57,890	17,13,745	26,52,611
						1876–77							
North Frontier—By native carriage		16,758	88,820	33,127	55,752	43,462	11	22,438	539	2,143	1,460	1,17,928	1,46,582
West Frontier—By native carriage		24,618	49,320	14,964	34,879	8,841	32	459	160	97	898	48,979	85,289
South Frontier	By native land carriage	41,358	1,48,431	2,79,811	3,29,378	10,969	2,040	1,44,813	43,279	8,222	8,623	4,85,173	5,26,751
	By native boats on the Indus	—	5,77,756	4,710	1,80,556	—	7,063	33	6,40,782	1,171	2,316	5,914	14,08,473
	By Steam Flotilla on the Chenab and Indus.	—	17,397	309	15,742	—	224	—	4,17,929	2,337	4	2,646	4,51,296
Total		41,358	7,43,584	2,84,830	5,25,676	10,969	9,327	1,44,846	11,01,990	11,730	5,943	4,93,733	23,86,520
East Frontier	By native land carriage	5,07,681	26,404	1,17,999	3,05,665	3,389	9,527	4,671	57,412	4,134	1,524	6,37,874	4,00,532
	By Sind, Punjab, and Delhi Railway.	28,736	16,782	2,75,194	5,14,394	79	79	6,766	39,600	8,399	15,577	3,19,174	5,86,432
	By East Indian State Railway	68,231	2,15,101	1,09,324	1,55,229	1,875	2,089	37,884	2,81,870	6,994	956	2,24,308	6,55,245
Total		6,04,648	2,58,287	5,02,517	9,75,288	5,343	11,695	49,321	3,78,882	19,527	18,057	11,81,356	16,42,209
Grand Total		6,87,382	11,40,011	8,35,438	15,91,595	68,615	21,065	2,17,064	14,81,571	33,497	26,358	18,41,996	42,60,600
						1877–78							
North Frontier—By native carriage		38,175	2,14,315	35,437	1,27,463	45,427	2	23,169	288	5,406	1,026	1,42,614	3,43,094
West Frontier—By native carriage		12,684	31,620	7,703	20,246	11,290	7	171	25	186	25	32,034	51,923
South Frontier	By native land carriage	60,568	98,291	1,69,342	2,91,935	3,975	2,973	29,955	7,499	2,151	2,433	2,65,991	4,03,131
	By native boats on the Indus	1,855	12,14,584	11,758	3,38,330	60	23,820	831	2,87,108	3,255	—	17,759	18,63,842
	By Steam Flotilla on the Chenab and Indus.	—	86,176	224	48,570	—	6,124	200	1,26,393	4,556	662	4,980	2,67,925
Total		62,423	13,99,051	1,81,324	6,78,835	4,035	32,917	30,986	4,21,000	9,962	3,095	2,88,730	25,34,898
East Frontier	By native land carriage	7,38,807	1,47,307	78 251	13,58,159	9,633	6,709	21,049	72,837	5,437	748	8,53,177	15,85,760
	By Sind, Punjab, and Delhi Railway.	48,772	9,01,833	1,30,206	58,33,217	1,366	2,022	23,978	12,511	21,987	1,477	2,26,309	67,51,060
	By East Indian State Railway	6,788	3,47,672	1,21,368	60,121	5,466	2,073	82,322	32,646	11,572	327	2,27,516	4,42,839
Total		7,94,367	13,96,812	3,29,825	72,51,497	16,465	10,804	1,27,349	1,17,994	38,996	2,552	13,07,002	87,79,659
Grand Total		9,02,649	30,41,798	5,54,289	80,78,041	77,217	43,730	1,81,675	5,39,307	54,550	6,698	17,70,380	11,709,574

ABSTRACT of the foregoing.

—	1873–74.			1874–75.			1875–76.			1876–77.			1877–78.			Average of the Five Years ending 1877–78.		
	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.	Imports.	Exports.	Excess of Exports.
Wheat - - - -	—	5,94,788	5,94,788	6,55,850	26,45,889	19,90,039	8,30,654	7,40,577	—90,077	6,87,382	11,40,011	4,52,629	9,02,649	30,41,798	21,39,149	6,15,307	16,32,613	10,17,306
Other food grains - -	3,47,051	63,75,460	60,28,409	5,10,834	32,98,520	27,87,686	6,40,414	10,20,327	3,79,913	8,35,438	15,91,595	7,56,157	5,54,289	80,78,041	75,23,752	5,73,605	40,72,789	34,99,184
Total - -	3,47,051	69,70,248	66,23,197	11,66,684	59,44,409	47,77,725	14,71,068	17,60,904	2,89,836	15,22,820	27,31,606	12,08,786	14,56,938	1,11,19,839	96,62,901	11,88,912	57,05,402	45,16,490
Oil seeds - - -	48,482	3,81,290	3,32,808	61,167	3,27,620	2,66,453	1,22,092	8,20,867	6,98,775	2,17,064	14,81,571	12,64,507	1,81,675	5,39,307	3,57,632	1,30,096	7,10,131	5,80,035
Oil - - -	2,845	5,819	2,974	15,074	47,940	32,866	51,603	57,890	6,287	33,497	26,358	—7,139	54,550	6,698	—47,852	31,514	28,541	—2,973
Ghi - - -	49,085	9,698	39,387	79,738	20,012	—59,726	68,982	12,950	—56,032	68,615	21,065	—47,550	77,217	43,730	—33,487	68,727	21,491	—47,236
Grand total -	4,47,463	73,67,055	69,19,592	13,22,663	63,39,981	50,17,318	17,13,745	26,52,611	9,38,866	18,41,996	42,60,600	24,18,604	17,70,380	1,17,09,574	99,39,194	14,19,249	64,65,565	50,46,316

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

NORTH-WESTERN PROVINCES AND OUDH.

The statistics now submitted of the average cultivation, produce, and consumption in the districts of the North-Western Provinces are derived from four sources:—

(i.) The administration reports of the Board of Revenue for 10 years from 1867.

(ii.) The latest settlement reports available.

(iii.) The village field records compiled under the new system for 1876–77 (those for 1877–78 are not used, being of an abnormal character on account of the drought).

(iv.) The replies of district authorities to the famine queries.

In the returns, figures, except for total area, are given in even thousands.

Sources (ii.) and (iii.) are not available for the permanently settled districts.

The statistics of administration reports are very unsatisfactory and unreliable since the same figures have been repeated without alteration for a long series of years, and are evidently not the result of fresh inquiry each year.

The settlement statistics are of varied value—those of earlier years being very much more imperfect than those of later date, but both are equally subject to defect on the following grounds:—

(i.) That landholders purposely throw land out of cultivation in the years of measurement in order to deceive assessing officers.

(ii.) That settlement surveyors often omit to record crops not standing at the time of survey, so that estimates of produce deduced from their returns must often be below the mark.

The village returns under the new system of field records ought to provide the best statistics, but the year for which they are reported was the first year in which the system was introduced, and a great deal of inaccuracy resulted from inexperience and delay in commencing work.

The district officers replies are probably based on one or other of the above data, but so little explanation was afforded concerning the figures originally submitted that it was found necessary to make further inquiries, which have not been as yet completely answered.

Mode of Collecting Agricultural Statistics.—It is necessary to notice here the machinery by which agricultural statistics are now collected in the North-Western Provinces.

To every cultivated area of 1,500 to 2,000 acres there is a native official called the village accountant (or *patwari*), whose duty it has now been made to note each year in a field-book the agricultural circumstances of each field in his circle—*e.g.*, crop or crops, rent, tenancy, &c. Abstracts are compiled from the field-book, which show in tabular forms the complete agricultural circumstances of every village. To superintend every 30 or 40 *patwaris* is an overseer, called a *kanungo*, whose duty it is to instruct and supervise them in their work, and also to compile similar abstracts for each portion of the district under his supervision.

The question is asked whether any suggestions can be offered for the improvement of agricultural statistics. It is sufficient to reply that, as far as these provinces are concerned, the system which has been described forms the most complete basis which it is possible to establish for the collection of agricultural statistics, and only requires thorough supervision by district officers to ensure accurate results. The Government of these provinces and the Board of Revenue have taken measures through the Agricultural Department to maintain sufficiently strict inspection for the purpose. The outcome of the system will be a series of statistical volumes, which, containing annual entries excerpted by *kanungos* from the *patwaris'* records of the year, will exhibit under appropriate heads the fiscal and agricultural history of each mahal, village, and district for the period over which they extend, and thus provide a sound basis for future revenue and settlement operations.

The "further inquiries," to which reference has been made, have been instituted through this agency, and the replies received must be accepted as the best obtainable, as there is no time for further revision. A great deal of the information required would previously have been forthcoming had it not been for the occurrence of the late drought, which compelled district officers to utilise the establishment for more urgent work (connected with the exigencies of the season) almost immediately after the introduction of the new system.

DIVISION OF PROVINCE INTO BELTS.

In dealing with the statistics of the province some acquaintance with the changes which occur in its physical characteristics from north-west to south-east, is necessary. Tracts differing in climate, temperature, soil, and moisture are followed by different agricultural conditions, are differently affected by a failure of rain, and require different treatment as regards irrigation. Changes, such as those to which reference is made, are not conterminous with district boundaries, a fact which makes it difficult to accept the district as the unit with which we should deal.*

The province is divided into four belts approximately parallel to the Himalayas, of which the characteristics are more or less different; but it must be borne in mind that the change from one belt to another is not abrupt but gradual, and it must also be remembered that a simultaneous and gradual change in physical conditions also occurs from north-west to south-east at right angles to the line of the belts.

I.—SUB-HIMALAYAN BELT.

The first or Sub-Himalayan belt has water near the surface, and the soil is usually so moist that artificial irrigation is not needed. The main crops are sugar-cane, rice, and cereals, of which even sugar-cane is not artificially irrigated, a fact which has surprised many accustomed to the necessity of plentiful watering for cane in other parts of the province. To give instances at either extremity of the belt:—Of the cultivated area in the district of Bijnor only 5·8 per cent. was irrigated at the time of settlement, whereas sugar occupied 14 per cent. of the area; and of Tilpur, a typical pargana in the north of Gorakhpur District, the settlement officer writes: "Irrigation is not cared for. The soil is lusty and moist, producing all the ordinary crops in abundance without any artificial watering. There are 390 wells used, generally not for irrigation, but for the other purposes of life. The average depth of water is 8 feet, and of the water itself 6 feet."

The settlement officer of Bijnor writes: "Masonry wells are hardly ever constructed, but earthen wells (mere excavation of a shaft) can be made almost everywhere." Of Bareilly: "Owing to the abundant rainfall and nearness of water to the surface, irrigation is not nearly so necessary with us as in the Doab. In the northern parganas (*i.e.*, the nearest to the hill range), fine wheat and even sugar-cane are grown without any irrigation at all," and even where wells are used "only one watering for spring cereals is necessary." So also the settlement officer of Sháhjahánpur writes: "One watering is sufficient, and that often a sprinkling rather than a slushing, so that it is impossible to give any average area of irrigation per well.

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* Another reason is that information from some districts is not only deficient but misleading.

Some use has, however, been made of rivers in utilising the fall of streams issuing from the hills both in small canals and in damming up channels, but in considering this source of irrigation it must be distinctly remembered that districts in Rohilkhand run closer to the foot of the range than districts in Oudh and east of Oudh, where they are separated from the hills by a strip of level plain belonging to Nepal. The utilisation of stream fall is therefore easier towards the west than towards the east of our Sub-Himalayan belt. Small canals have been made in Bijnor, the most westerly district, but the settlement officer still remarks that "the irrigating power of the Bijnor river, is by no means worked up to its potential limit," and while General Ramsay has shown what can be done at the very foot of the mountain slope in his Bhábar canals, but little scientific work has been effected in any other portion of the belt, the most notable exception being the almost thorough protection of a Government grant estate by its owner in the north of the Gorakhpur District.

The above is a general indication of existing circumstances in the north or Sub-Himalayan belt.

II.—Rohilkhand and Ganges-Gogra Belt.

The second belt, roughly termed the Rohilkhand and Ganges-Gogra belt, approaches in the northern direction the Sub-Himalayan character,* and the Doáb character towards the south. One of the leading characteristics of the belt is its intersection by broad river valleys themselves serrated by the constantly changing courses, old and new, of shifting streams, which are at intervals fed from smaller river courses falling into them from either side. The main difference between the river system here and in the Sub-Himalayan tract is that water runs through broader and less contracted beds in the former than in the latter. The shallowness of the river channels and the wide extent of arable land on either side of them leads to an extensive use of dams and to various arrangements between zamindars and cultivators for distributing the cost of utilising river water.

Subsoil water has now become further from the surface, and is generally not found at a less distance than 10 to 15 feet, but on account of the decreasing humidity of soil and atmosphere wells are far more abundantly used than in the sub-Himalayan tracts. It is necessary, however, to divide the Rohilkhand and Ganges-Gogra belt into two sections for the following reasons:—The soil is sandier and less consistent in the west than in the east, and tanks and wells are, therefore, more easily maintained in the latter than in the former. Partly owing to this cause, partly to the greater value of the stiffer soil (which makes irrigation pay better), partly to the more forward condition (owing to historical causes) of the eastern districts, means of irrigation exist to a much higher extent in the east than in the west, notwithstanding that climatic conditions and produce are similar. Rice, sugar, and spring cereals are predominating crops in both. The difference in irrigation (gauged by a reference to the figures for the lower tracts of Budaun, Sháhjahánpur, and Bareilly, and to those for Jaunpur and Azamgarh) is that in the former about one-half, and in the latter very nearly three-fourths is irrigated; and while in the former hardly a masonry well exists, in the latter they are very numerous. It is also the case that earthen wells are often more stable in the east than in the west, where they seldom last more than one year.

III.—Doáb Belt.

The two portions of the Doáb belt differ (as elsewhere explained) in the large proportion of sand in the west (IIIA.) and in the prevalence of saline efflorescence in the east (IIIB.) Both are traversed by canals as far as Cawnpore, irrigation from which covers nearly one-eighth of the cultivated area of the districts from Sahâranpur to Cawnpore. Wells are more easily maintained in the east than the west (for the same reason that reh is more easily collected and retained), namely, because soils are on the whole firmer and less permeable.

The following brief description is given of a central tract (North Cawnpore) in the lower Doáb country in Mr. Buck's note on reh*:—

"The main stratum of the country is a light soil containing a good deal of silica. It is intersected by a succession of small rivers, more or less parallel, which flow in a slanting direction into the great rivers, the Ganges and the Jumna. They are usually flanked on each side by an undulating strip of varying width which the drainage has cut up and rendered sandy. But between each pair of rivers, and *skirted by the sandy strips*, is a depressed table-land of some few miles in width in which the soil is *principally loam*, and which is full of lakes or jhíls and reh-infected tracts, which lakes themselves form the source of a new or intermediate stream. Sometimes, as I proved by the persistent examination of earthen wells over a tract 400 or 500 square miles in extent, the loam stratum is very shallow, a mere veneer as it were above the more sandy stratum, and sometimes it disappears entirely or alternates with patches of sand, but on the whole loam, becoming clayey in depressions, is the prevalent soil."

Towards the north-west, *i.e.*, as we approach belt IIIA., loam becomes less and less prevalent, and extensive tracts of light brown sand begin to appear more and more frequently in which irrigation of any kind is both difficult and unremunerative. Such is the class of land which (as explained elsewhere) chiefly gives rise to the large per-centage of the cultivable margin (not cultivated) in the districts of belt IIIA. Wells, although more easily maintained in the east, are, however, practicable in most parts of the Doáb, whether in IIIA. or in IIIB.; but wherever the Ganges or Jumna is approached the water level sinks until it often occurs that water cannot be found

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* The climate is much like that of most parts of Oudh and Rohilkhand, drier than that of lower Bengal, but moister than that of the Doáb; and the country throughout the year, except in the months of May and June (till the rains come on), has some pretensions to looking green and fresh, and is not brown and parched like the Doáb. It is quite an exception for two full months to pass at any time of the year without some rain, and usually the winter rains are pretty regular and copious about Christmas time, or during the first fortnight in January.

The Settlement Officer of Azamgarh writes:—

"There are numerous swamps which are dry, or nearly so, during the hot season, but in the rainy season they spread over considerable areas. Much of the land along their edges and within reach of them is then under rice cultivation, and beyond the depth at which cultivated rice can grow there is generally a broader or narrower fringe of rushes (*narai*) and wild rice (*tinni*)."

* Compare Mr. Evans' report of Farukhabad:—

Description of the Minor Doábs.—"The general physical features of these tracts between pairs of rivers are described by Mr. Elliott. First we have at each limit north and south the alluvial beds, *i.e.*, the strip of land lying between the sandy slopes leading down to the river beds and the rivers themselves, and year by year more or less flooded by the rivers in the rains. Passing inwards are two sandy tracts rising from the basins of the rivers, the outer edge cut up by ravines which carry off the drainage of the country. These gradually become more level as one passes onwards. At the same time the soil also gradually changes, becoming firmer and less sandy by degrees, until after a while a loamy soil called dumat appears; no distinct boundary line between the two being generally perceptible. This dumat tract forms the central watershed of the Doab, and along the central line of it lie reh plains and the lakes that accompany them, when the cultivation, instead of being continuous, lies in patches of various sizes like islands in the usar. These central dumat strips may be said, roughly speaking, to be the irrigated portion of the district. In them wells are made with little difficulty and expense; they require little or no artificial assistance, such as is afforded by wattle coils or wooden or masonry frames, and last for a considerable time. In the sandy tracts wells either cannot be sunk at all, or last but a year or two, unless built up with masonry from the spring level."

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nearer than 60 or 70 feet, and well irrigation becomes too expensive to use except on the very best land. The same circumstance happens to a smaller degree in the marginal land of the streams feeding the two large rivers, where not only is water further from the surface than in the central tracts, but substrata are more sandy and shifting, making the maintenance of wells more difficult than in the middle strips, where water is nearer. It is also the case that, owing to the greater depth at which water is found throughout the Doáb as compared with the north Ganges country, a greater variety of strata have to be pierced before water is reached in the former than in the latter, and it may therefore be easily understood that localities frequently occur where the substrata are so loose that earthen excavations will not stand. The consequence is that tracts fully protected and tracts not protected at all are dovetailed together somewhat promiscuously.

It is unfortunate, however, that canals and canal branches, led as they must be along water-sheds, follow the very lines which in the Central Doáb at least are best suited for wells, a circumstance proved by the small gain in revenue "due to canal" in the Central Doáb districts (land formerly "well" irrigated being classed as giving no revenue to canal).

"Other sources," *i.e.*, tanks, jhíls, and rivers, form a very small portion of the irrigation in the Doáb. The dryness and greater permeability of the soil, which, even when loam or clay above, is usually sandy under the surface, will not allow of the retention of water to any very serviceable extent, and what irrigation is derived from collected rainfall is confined chiefly to the series of shallow lakes or ponds in the central depressions (described in the note above quoted), from which water is lifted for rice or for the irrigation of young cereal crops in the first month or two after the rains; artificial tanks are so unusual that their existence as an irrigating factor may be ignored, while river water is very little used on account of the depth of water below the cliffs and the small width of the alluvial beds which are within irrigating reach.

Crops in IIIA. differ from those in IIIB. in that the former grows more sugar and wheat and less cotton and indigo. Cotton and indigo are, however, grown in the lower part of IIIA., and the upper part of IIIB. to a greater extent than in the extreme north-west, or than in the extreme south-east of the belt. In the latter indigo is stopped by the absence of canal irrigation, for it must be noted that indigo cannot, as in Bengal, be grown without water in the North-Western Provinces, and in the former cotton is subject to too heavy rainfall.

IV.—SOUTH JUMNA BELT.

The south belt is marked by decreasing rainfall and increasing depth to water. Soils are poor, and produce on account of the dryness of the atmosphere as well as of the want of humidity in the ground, is subject to great oscillations. The only exception is the black soil formation which runs through Bundelkhand, and which is tenacious of moisture, but at the same time almost impracticable under irrigation. The crops grown are in the autumn chiefly cotton with the millets and pulses, and in the winter gram and oil seeds are more common than in most districts north of the Jumna. Water lies at great depths, very often below 50 feet. In the tracts of Muttra and Agra, cultivated as they are to a great extent by the industrious Jat community, masonry wells are numerous, and large areas fully watered, but in the similar tracts of Jalaun, Hamírpur, and Bánda wells for irrigation are almost unknown.

Physical Changes from West to East.

The synopsis which has been sketched in the preceding paragraphs, indicates in the roughest way the broad outlines of variation with respect to existing physical conditions which are met with in receding from the Himalayas towards Central India. To sum up the facts in a still briefer abstract it may be said that rainfall and atmospheric moisture decrease, and that subsidence of water below the soil and difficulty of irrigation increase in proportion to distance from the Himalayan Range. It may also be noticed that this decrease in moisture (above and below the soil) is crossed at right angles by steady changes of another kind both in atmosphere and soil, the first of which may be described as the transition from the west to the east wind region, and the second as the transition from sand to loam.

The north-westerly districts, except those close to the Himalayas, have far greater aridity in the dry weather, a fiercer heat in the summer months before the rainfall, and more prolonged cold with a lower temperature in the winter, which circumstances are chiefly due to the prevalence of the dry west wind which blows over them, and which hardly reaches the south-easterly districts. The change is marked by no well-defined limit, but varies in intensity and in position from year to year, and always assumes a more or less gradual character.

The transition from sand to loam is equally difficult to define, for sand and loam tracts are intermixed in a confusing way throughout the central districts of the Doáb; but it may be noticed that large stretches of sand dunes occur in the districts in the neighbourhood of Meerut, which indicate an extensive prevalence of sandy soil, while below Cawnpore the class of "light blown sand," so common in the west, disappears almost completely from the settlement officer's record.

Physical Changes accompanied by Changes in Produce.—The gradual changes of atmosphere and soil in both directions are roughly marked by changes in the character of production. While, for instance, there is no cotton in the belt adjacent to the Himalayas, and little in the penultimate belt, it increases in the Doáb, and rises to a maximum south of the Jumna. Sugar, on the other hand, recedes in the same direction that cotton progresses. So, too, wheat, which likes winter cold and dryness of atmosphere, declines from west to east, while rice inceases in importance in the direction in which the stiffer soil and damper winds of the east tend to preserve the moisture which it requires. There are a variety of other cross lights which could (with closer statistics of detail), be clearly mapped and traced to their physical causes, but the above broad shades will sufficiently delineate the leading characteristics which belong to the different quarters of the province, and which bear a very intimate relation to its requirements for irrigation.

Statistical Statements.

(1.) *Character of Uncultivable Land.*—Noticing first the per-centage of cultivable area in each district, it will be found that the per-centage of cultivable area (not cultivated) is as a rule largest in those districts in which sand predominates. Light sand can hardly ever be called absolutely uncultivable, whereas almost all rocky stony soil, and very much of the land impregnated with saline admixtures, are absolutely uncultivable. It has also to be remembered that there is much saline land of which it is impossible to state whether or not it is cultivable, and that in consequence the per-centage of cultivable land allotted by one settlement officer to one district has not the same meaning as the per-centage allotted by another settlement officer in another district.

The uncultivable area in the northern belt consists chiefly (1) of stony undulations or slopes at the foot of the Siwaliks or Himalayas, which occur most prominently in the districts of Sahâranpur, Bijnor, and Tarái, in which it will be noticed that the per-centage of uncultivable land is very large, (2) of swamps, and (3) very light sand on the edge of river beds.

The Rohilkhand and Ganges-Gogra belt has on the

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whole a very small area of uncultivable land (especially on the side nearest the Himalayan Range), as will be seen by observing the figures for districts which lie either completely or almost completely within it, namely, Bareilly, Budaun, Sháhjahánpur, Hardoi, Sitapur, Kheri, Bahraich, Gonda, Basti. The north-west portion of the belt is characterised "by broad sandy ridges, lying above and along the wide valleys of the rivers of which some portion is uncultivable; but as the Settlement Officer of Bijnor remarks, "the places are very rare where sand so entirely predominates as to produce this result." There is also a large area of land which is rendered uncultivable by swamps and water lying on the land after the rains. In the south-east portion of the belt now under remark reh appears and renders uncultivable large areas, but not so extensive as those which are made sterile by the same cause in the Doab. The districts affected by reh are those which lie nearest the Ganges from Lucknow to Azamgarh, and to this cause may be attributed the rise in per-centage which occurs in the uncultivable area of those districts, although there is a suspicion that in some of them (and notably in Lucknow, Sultanpur, and Partabgarh) the area of uncultivated land may have been over-estimated.*

In the third or Doáb belt reh is the main cause of sterility. Reh appears to cross the Jumna from the districts north of Delhi on the Punjab side to the districts south of Delhi on the North-Western Provinces side, and, running through the centre of the Doáb as far as Allahabad, seems to find its way across the Ganges into Oudh, somewhere to the west of Lucknow, on the east of which district most of the country between the Ganges and the Gogra is affected by it, but, as observed, not so seriously as the Doáb. Reh is described by the Settlement Officer of Etáwah as appearing on "level plains from which water cannot escape." This is true, and it occurs more especially in the drainage basins (often several square miles in extent), from which the small river feeders of the Jumna and the Ganges take their rise. It is a noteworthy fact that in this region, *i.e.*, the Doáb belt, the water level, except near the Ganges, is from 20 to 30 feet below the surface, and it is probable therefore that there may be some connection between the conditions of humidity in the air and the soil and the appearance of reh at the surface of the district which lie in it. In the report on reh lately submitted to the Government of the North-Western Provinces and Oudh it was generally agreed that desiccation of atmosphere combined with a certain amount of moisture in the soil are necessary to produce that amount of evaporation which is sufficient to bring reh above ground. It is certain that in the Sub-Himalayan belt, where water is near the surface, and the atmosphere damp, and in the south belt, where water is distant and the air extremely dry, reh is practically absent. Whatever may be the case, however, the per-centage of uncultivable area in reh-infected districts is very large, rising in the Central Doáb to more than 30 per cent.

Passing now to the south-west belt, uncultivable area is due mainly to the extensive ravines which skirt the Jumna and some of its feeders, and to the stony undulating ground on the spurs from the Vindhya Range which penetrate the North-Western Provinces on its southernmost frontier from Gwalior to Rewah. Mr. Crosthwaite, the settlement officer of Etáwah, describes some tracts of that district which lie along the Jumna as "wild and inhospitable regions of ravines," terms which may be applied to much of the country on both sides of this river from Agra to Allahabad on the south boundary. The conformation of the hilly tracts in the districts of Jhánsi, Lalitpur, Hamírpur, Pánda, and Mirzapur, assimilates to that of the similar well-known country in Central India, and hardly needs further description.

(2.) *Cultivable Margin.*—The character of the cultivable margin follows very closely that of the uncultivated area: but, as noticed above, the per-centage of the former is as a rule smallest when that of the latter is greatest. The total figures show that about two-fifths of the province are uncultivated, of which, roughly speaking, more than one-half is cultivable.

Much of the cultivable margin, as well as of the uncultivable area, is reh-infected land, which would undoubtedly be brought under cultivation if reh could be eradicated, for it is a well-known fact that some of the best land of the province is that with which reh patches are intermixed. Mainpuri is a typical district, comprising as it does instances of three of the classes of land which have been described. In the north are the sandy tracts which characterise the upper part of the Doáb belt; in the centre the loam reh-infected tracts, which belong to the Central Doáb; in the south the poorer country terminating in ravines, which are included in the South Jumna belt. The following is the description given in a review by Mr. Crosthwaite, when secretary to the Board of Revenue, of the central portion: "This region," he writes, "of which the distinguishing features are *the prevalence of reh plains*, jhíls and marshes, and the wonderful fertility of the land under cultivation, is the *garden of the district.* From east to west it stretches in one uniform plain of high cultivation, luxuriant crops, and copious irrigation (the Arind runs down its centre, with the Cawnpore and Etáwah branches of the Eastern Ganges Canal on either side), culminating in the Mustafabad pargana, in which every advantage, natural and artificial, are found combined in a remarkable manner. The soil of this tract is *principally loam.*"

A great deal of the cultivable area of the Sub-Himalayan belt, and of the north portion of the penultimate belt, and some portion of that in other belts, is now occupied by forest or grass and is good land, but it is doubtful whether the province would not suffer by the diminution of pasturage which would occur if any material portion of this area were brought under the plough. As it is, the protection of forests has obliged the exclusion of cattle from much of the area in which they were accustomed to graze, and any further curtailment of grazing land is to be deprecated. Another useful service which the cultivable margin performs, especially in the moister belts of the country, is the supply of thatching and fodder grasses which grow abundantly in jhíls and marshes prevalent throughout the country between the Jumna and the Himalayan Range, which are more numerous still as the Himalayas are approached.

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* There is no reason to believe that Rae Bareli, which has over 17 per cent., and Jaunpur, which has only 10 per cent. of uncultivable land, are essentially different in character from the districts which lie between them, in which the per-centage is recorded as 24 and 30 per cent.

Elliott.

[*Supplementary note in continuation of Mr. Buck's Reply.*]

1. We come next to the question of the manner in which the cultivated area is sub-divided, *i.e.*, the crop acreage. And here we are met by the serious imperfection of the record, which makes it impossible as yet to deal with this subject as exhaustively as it deserves. The annual statements which every village accountant is bound to file contain an almost complete account of the agricultural condition of each village. They show the total area, the cultivated area, and the culturable waste. Against each field is recorded the name of the occupant, the area and the crop sown, whether the field is irrigated or not, and if irrigated, from what source it gets its water, the rent due and the rent paid for it—and these figures are totalled up for the entire village. If the village totals were similarly gathered together it would be easy to present to the eye a complete synopsis of the agricultural position of each district and each sub-

division of a district; and if the village returns were scrutinized by a body of competent officers, and a sufficient per-centage of them tested from time to time on the spot, and the entries compared with the actual facts, a high degree of accuracy would be obtained, and the general results would be worthy of entire confidence. Unfortunately several circumstances have combined to mar the seeming completeness of this scheme. In the first place, part of the North-Western Provinces (known as the Benares Province) is permanently settled; and in these districts there has been of late years no such careful field survey as is essential to provide the first data for agricultural statistics. Fields have altered in shape and size, and new land has been brought under cultivation, to such an extent that the old records are no longer trustworthy. In the second place, no sustained and combined effort was made to utilize the village records by totalling the figures up for districts until the new Agricultural Department was created for the North-Western Provinces in 1874; and though great progress has been made under that department, it has not yet succeeded in carrying out its main object in all districts of the North-Western Provinces, whilst its operations have not yet extended to Oudh. Mr. Buck has also already explained how the drought of 1877 disorganised his department, necessitating the diversion of the attention of officers to more immediately pressing subjects. There are, therefore, four classes of districts in the province: (1), the permanently-settled districts, as to which the total cultivated areas are very doubtful, and the detailed crop areas altogether unknown; (2), the Oudh districts which have been recently surveyed and settled, and regarding which the areas are therefore pretty accurately known, but the areas under each crop are less correctly recorded, because there has been no definite system of supervising the returns of the village accountants, and abstracting their general results; (3), six districts of the North-Western Provinces in which the Agricultural Department has not yet effected its desired reforms, so that the crop figures cannot be relied on; four of these are Himalayan or sub-montane districts, in which the areas are very large and the staff required for recording the crops is either inadequate or altogether non-existent; (4), twenty-four districts of the North-Western Provinces, into which the new system of the Agricultural Department has been definitely introduced, and the figures abstracted from the village returns are fairly trustworthy, though even here, as experience is gained and as supervision is more active, improvement is to be expected. It is proposed, therefore, in this reply, firstly, to give in full detail the crop areas for the 24 districts, so as to show what conclusions may be drawn from them, and then to apply the same ratios to the cultivated area of the entire province.

2. Before proceeding further, it may be as well to mention here the two great difficulties in the way of securing accurate crop statistics in Upper India. One of these is the habit of double-cropping. If all the land bore only one crop a year it would be sufficient to go over it once and to record the crop on it or just taken off it, and the total area under crops would agree with the total cultivated area. But where land is rich and highly manured, two and sometimes three crops are taken off it in the year; and to record these requires frequent visits and greater care, and it is necessary to bear in mind, what is often forgotten, that the cropped area should always be larger than the cultivated area. The second source of difficulty is the extraordinary extent to which mixed crops are grown. This habit makes the record confused and lengthy to a degree which can hardly be conceived. To give an example, a statement of the crops grown in the Moradabad District has been examined, with the result that, though the main kinds of articles are but 23, the combinations in which they can be grown with non-food grains and with each other amount to as many as 243. This enormously increases the difficulty of classifying the crops; and it is impossible to do it with perfect accuracy, since the proportion borne to the whole by each item in the mixed crop cannot be known, though a fairly approximate estimate may be formed.

3. The rate of produce per acre assumed as the average of each of the 24 districts will be found in the appendix.* The data on which these assumptions are made are as yet somewhat tentative, and no great degree of accuracy can at present be claimed for them. The main basis for the figures assumed has been obtained (1) by taking the estimates made by the different settlement officers while engaged in assessing the districts, during which time it has been very common to make experiments by cutting and weighing the produce of selected fields; (2) by comparing these figures with each other, and using them to modify each other, wherever, for example, there was much difference in the estimates for two adjacent districts with similar soils and system of cultivation; (3) by testing the general result by means of the requirements of the district. It may be taken as an axiom that the whole province produces on an average a little more food than its population ordinarily consumes. There is always more export than import of food. And the same rule applies, with very few exceptions, to each component part of the province—that is to each district. Large towns cause an exception to the rule, especially when the district in which they stand is small, as is the case with Benares. Another exception might be found in the case of a district largely given up to growing non-food crops which purchases part of its food from elsewhere. But this is not believed to be the case in any part of the North-Western Provinces, though the Rohilkhand districts come nearest to it. Growing an unusual quantity of sugar-cane, their out-turn of food grain comes closer to the actual need of the population than elsewhere; and Rohilkhand does frequently import food grains whenever it suffers from a short crop, paying for them by the price of its sugar. On the whole, however, this rule holds good, and it affords a sound general test of the accuracy of any calculation of average out-turn, since none can be correct which does not result in a figure slightly exceeding consumption.

4. *External Trade of the Province.*—An assertion such as this might probably be made in safety, in reliance on the known facts of the province and the general experience and consent of the officers engaged in the administration. It should, however, be capable of further demonstration by provincial trade statistics, if these had been kept up as long and supervised as carefully as has been the case in the Punjab and the Central Provinces. This, however, has not been done in the North-Western Provinces. Indeed, no statistics at all had been collected till it was decided in 1875 to establish a system corresponding to that of the adjoining province, by keeping up registering posts on the chief lines of communication. The year 1877–78 was the first year during which this system was fully at work; and it has now been decided by the orders of the Secretary of State that the system should be abolished. Short, however, as the period has been, the statistics collected have furnished some useful information. It will not be overlooked that 1877–78 was an altogether abnormal year. The kharif crop failed almost totally, and hence there was a net import of grain instead of a net export to supply the deficiency. Cotton also, and sugar, which are the products of that crop, were produced in much smaller quantities than usual; and trade was slack throughout the year, as the purchasing power of the people was much reduced. The following statement shows in abstract form what is furnished in greater detail in Mr. Buck's two annual reports, the net exports or imports of the main articles of commerce:—

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* Statement No. 2.

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Articles.	1877-78.		1878-79.	
	Net Imports.	Net Exports.	Net Imports.	Net Exports.
Cotton	84	—	—	153
Piece goods	102	—	519	—
Drugs	13	—	15	—
Dyes	—	11	—	25
Wheat	—	359	—	2,238
Other grains	8,183	—	—	2,271
Lac	11	—	—	—
Metals	417	—	775	—
Oil seed	—	3,450	—	6,221
Opium	—	129	—	91
Ghi	—	77	—	141
Salt	1,561	—	2,384	—
Saltpetre	—	7	—	—
Spices	21	—	46	—
Stone	145	—	—	—
Sugar, refined	—	722	—	476
„ unrefined	—	873	—	1,654
Tea	—	1	—	—
Tobacco	—	49	9	—

Note.—The figures are in maunds, 000's omitted.

As far as it is possible to draw any conclusions from the figures of only two years, one of them an exceptionally bad one, they should apparently be these. The normal imports of the country are piece goods, drugs, metals, salt, spices, and stone. Cotton was imported in 1877-78, because of the failure of the crop that year; but in 1878-79 the crop was an ordinary one, and it resumed its place among the exports.

The chief normal exports are wheat and other food grains, ghi, oil seeds, sugar, opium, and indigo. With regard to tobacco it is difficult to say what the facts are; but the general impression seems to be that the province, as a rule, consumes a little more tobacco than it grows, and does not ordinarily export, though it did so in 1877-78. How much the ordinary course and balance of trade were affected by the drought of 1877 is seen from the fact that in 1876-77 the North-Western Provinces exported by rail alone net 210,000 tons of wheat or 5,880,000 maunds, while in 1877-78 the net export was only a sixteenth of this, and was counterpoised by a very large import of inferior grains.

The trade of the province during 1878-79 with its neighbours was valued at—

	Rs.
Imports	7,05,63,000
Exports	8,80,75,000

leaving a slight balance in favour of exports, while the trade with foreign countries through the ports of Bombay and Calcutta was valued at—

	Rs.
Imports	5,64,29,000
Exports	11,13,96,000

leaving a balance of Rs. 5,49,67,000 in favour of the exports.

5. Having then obtained this general view as to the extent to which the producing powers of the province fall short of or exceed the requirements of its inhabitants, the next step is to consider what those requirements are.

As to the amount required for human food, the data for the calculation are as follows. The North-Western Provinces jail ration for adult prisoners confined for periods not exceeding three months, and doing light labour, is 1½ lbs. of the flour of the coarser millets or 1¼ lbs. of the flour of cereals. Making allowance for children who require half this ration, and for the loss in grinding, this may be taken as equivalent to 1¼ lbs. of grain per head per diem, or 5¾ maunds per annum. This precisely agrees with the quantity assumed as necessary in the Punjab, Bombay, and Madras; and is a little in excess of the estimate made in the Central Provinces and Berar, where 5 maunds is believed to be sufficient. It seems, therefore, advisable to estimate the food consumption at 5¾ maunds per head per annum, which is a little more than a ton of food to every five persons. The municipal estimate of consumption in towns is 7 maunds per head, but this would be too high for an estimate of the food of the rural population.

For seed grain the following estimate has been made, on the basis of the reports of several settlement officers and of the experience gained by the agricultural department:—

Wheat	80 lbs. per acre.
Barley	70 ,, ,,
Gram	40 ,, ,,
Joár and bajra	10 ,, ,,
Rice	60 ,, ,, (*i.e.*, 90 lbs of paddy.)
Maize	30 ,, ,,
Smaller millets and pulses	20 ,, ,,

For the loss by dryage after the grain is harvested, and by waste during the time it is stored, it is probably safe to estimate 5 per cent. of the gross produce.

The food consumed by cattle is the item regarding which least information exists. There is no regular return made of the number of cattle, as in the Punjab; and though many settlement officers took a census of them at the time of the survey the result was not very trustworthy. The plough bullocks alone, reckoning 8 acres to a yoke, must be 6 million in the North-Western Provinces with its 25 million cultivated acres; and this implies probably a total number of 12 to 15 million cattle, including cart bullocks, cows, calves, and heifers and buffaloes. Mr. Buck, arguing from a special census taken by himself in a small area, reckons the number of cattle as high as 20 millions, and estimates their food at 7½ million maunds. In the Punjab the total number of cattle is calculated as 6 millions (which is probably too low); and their food at 6 millions of maunds. In answer to a special inquiry made from district officers, a set of replies have been received according to which every plough bullock gets a seer of grain a day while ploughing (say four months) and the same while working at the well (say four months), or 6 maunds a year, which is more than the human population consumes. Such an estimate cannot be correct; but there is little doubt that the people seldom give their bullocks as much grain as they would like to give if they could afford it. Much food is given in the form of green fodder, besides the dry fodder and cotton seed which they habitually get. Probably 2 maunds a year of food grain would be a full calculation of what they receive on an average from rich and poor owners taken together. This would amount to 12 million maunds for the North-Western Provinces. Adding in something for cart bullocks (who always get grain while they are worked) and for milch cattle, I propose to calculate the consumption of food grain at 18 millions of maunds, or ¾ of a maund to each acre.

6. It is possible now after clearing the way by these preliminary remarks to estimate what the requirements of these 24 districts are, and what the amount of food grain is which on the hypothesis already stated must be produced by the food-growing area in these districts, so that any estimate of out-turn which should fall below this would be *ipso facto* condemned as incredible:—

	Mds.	Tons.
Population 20,530,000 at 5¾ maunds	1,18,047,000	4,216,000
Cattle food at ¾ maund per acre on 19,208,000 acres	14,406,000	514,500
Seed grain at rates above stated	9,401,000	336,000
Wastage at 5 per cent. (say)	7,500,000	268,000
	1,49,354,000	5,334,500

The average out-turn of food grains in these districts must necessarily be a little larger than this, in order to allow for the small amount of export that goes on,

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and for years that fall below the average. But it should not be much larger than this quantity; or else there would either be a rapidly accumulating store of grain in the country, or a larger export than is believed to exist would be required to carry it off.

7. The following table shows the abstract of the calculation made, the details of which for each district are entered in the appendix.* The district rates have been worked out, as already explained, by combining three different sets of considerations,—the estimates and conclusions arrived at by settlement and district officers; the principal that the assumed rates of adjacent districts ought to correspond to the known relative fertility of those districts; and the principle that such a result must be worked out as to show that every district is quite or nearly self-supporting.

STATISTICS of 24 DISTRICTS in the NORTH-WESTERN PROVINCES.

Food Crops.	Area, in Acres.	Produce in Maunds per Acre.	Total Out-turn, in Maunds.	Non-Food Crops.	Area, in Acres.	Value per Acre.	Total Value.
	*		*		*	Rs.	* Rs.
Wheat - - -	3,145	11·01	34,645				
Barley - - -	940	10·18	9,576·5	Sugar-cane - -	477·6	80	38,108
Gram -	1,281	8·37	10,718·5	Cotton - - -	456	20	9,120
Peas - - -	103·6	5·97	615·6	Cotton with arhar - -	807·6	10	8,076
Wheat, mixed - -	1,917	9·35	17,930	Fibres - - -	64	20	1,280
Barley, ,, - -	1,525	9·57	14,596	Indigo - - -	192·6	20	3,852
Jowar - . -	2,600	7·29	18,964	Fodder - - -	390·2	20	7,804
Bajra - - -	1,758	6·35	11,163	Potatoes - - -	15·5	100	1,550
Rice - - - -	1,309	11·19	14,654	Garden crops - -	179	30	5,370
Maize - - -	442	11·33	5,009	Tobacco - -	32·1	50	1,605
Pulses - - -	656			Opium - - -	67	50	3,350
Small millets - -	428·5	7·00	7,987	Oil seeds - - -	311·3	20	6,226
Miscellaneous - -	56·5			Miscellaneous - -	53·5	20	1,070
Arhar mixed with cotton -	—	5·00	4,038				
Total - -	16,161·6	9·20	149,896·6	Total -	3,046·4	28·7	87,411

* Three 0's omitted.

These figures lead to the conclusion that in these 24 districts the average out-turn of food grain is 9 maunds 9½ seers or 739 lbs., or about 6½ cwts. per acre; that there is one person to every ·787 acres growing food grains and to every ·935 acres bearing crops; that about 78·8 per cent. of the average food out-turn is required for the consumption of the people; about 21 is required for seed and food of cattle or lost by wastage and dryage, and about 1·3 per cent. remains over for export. So far the figures seem to be tolerably consistent with the facts, though the margin is probably smaller that the truth; and this may be accounted for by supposing either that the produce per acre is underrated, or else the double-cropped area is less than it should be.

8. With regard to the non-food crops, however, the result is not so satisfactory; and it appears impossible at present to make the estimate of consumption agree with the estimate of requirements. It has been seen from the trade statistics, imperfect as they are, that there is reason to believe that the province usually imports spices and tobacco but not cotton, though it did so in 1877–78; and that it certainly exports dyes, oil seeds, ghi, opium, and sugar. The agricultural statistics ought therefore, if they are to support the trade statistics, to show a deficit in the production of the one class of articles and a surplus in the production of the other. It does not, however, necessarily follow that the same result should take place in each district, or even in the entire area of the 24 districts. It is more customary to interchange articles of luxury than of necessity; and it has already been pointed out to what extent certain products, such as sugar-cane and cotton, are abundant in certain parts of the province and deficient in others. But, after making due allowance for this, there ought in so large a tract as this to be a tolerable approximation between production and consumption in the case of most articles, subject to the general conclusions drawn from the trade statistics.

It is necessary, therefore, to take each article in succession, and to frame an estimate of the requirements of the people and of the out-turn from the recorded area. In framing the former part of the calculation, the best guide is the estimate made by the North-Western Provinces Government of consumption in municipal towns. This was originally based on the octroi returns, and has been revised and checked during many years, so that it may now be accepted as tolerably correct; subject only to the proviso that in applying it to the wants of the rural population it is sure to be too high, since they do not consume luxuries to the same extent as townspeople.

I. Sugar.—The urban consumption is 30 lbs. of coarse and 10 to 12 lbs. of fine sugar a year, which is equivalent to about three times its weight in coarse sugar. Villagers do not buy much fine sugar, but in the cane districts (especially Rohilkhand) they consume a great deal in the course of manufacture. Taking 30 lbs. a head for the rural and 60 lbs. for the urban population (one-tenth of the whole), the requirements are—

Rural - 18½ millions at 30 lbs. 555 million lbs.
Urban - 2 ,, ,, 60 ,, 120 ,, ,,
Total - - 675 ,, ,,

The produce of the best sugar-cane land in Shahjahanpur was estimated by Mr. Butt at 55 maunds per acre, but this is much above the average. Taking it at 30 maunds all round,* or 2,400 lbs. per acre, the out-turn of 477,600 acres is 1,146 million lbs., leaving a surplus of 371 million lbs., or over 4½ million maunds, which is probably too high. The export of both 1875–78 and 1878–79 was, as has been seen before, about 3 million maunds from the whole province; but the period was one of unusually low production.

II. Cotton.—The best estimate made of cotton consumption is that by Raja Lachman Singh, of Bulandshahr, who puts it at 3 lbs. 10 ozs. per head of the rural population. Raising this slightly to allow for waste and for the urban population, we may reckon it at 4 lbs., or 82 million lbs. for the whole population of the 24 districts. The cotton-growing land is divided into two classes—that which grows cotton only, and that which grows cotton mixed with other crops, especially arhar. The first class produces on the best lands about 2 maunds an acre, say about 1½ as an average. Where it is mixed with other crops, the amount of mixture varies extremely, and only a rough estimate can be formed by which it may be put at ¾ of a maund. The out-turn will then be 1,286,000 maunds or 103 million lbs. This provides a surplus of 21 million lbs., and it has been seen that the province as a whole exported 12¼ million lbs. or 153,000 maunds in 1878–79. If this amount of export is normal the production must be larger than my estimate, since these 24 districts contain almost all the chief cotton-producing area, while Oudh and the remaining part of the North-Western Provinces grow very little of this staple.

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* Statement No. III.

* The average wholesale price is about Rs. 3 a maund, or a little less: hence the value per acre has been calculated at Rs. 80.

III. Tobacco.—The municipal estimate of consumption is 8 lbs. a head; but this is probably much too high for the villages and agriculturists. The Punjab estimate is 4 lbs., which is perhaps as low as we can reasonably go; and at this rate the consumption would be 82 million lbs. In order to produce this the 32,100 acres recorded as being under tobacco must turn out 2,700 lbs. per acre, which is certainly more than is the case. And yet the province as a whole exported in 1877–78 over 4 million lbs. The only two conclusions possible are—either that the rest of the North-Western Provinces and Oudh produce much more tobacco than the 24 districts of which we have statistics; or else that the area under tobacco is much underrated.

V. Garden crops.—The same difficulty exists in the case of vegetables. The jail ration is 6 ozs. of vegetables daily for an adult, or, say 4 ozs. a head for all classes, or 90 lbs. a year. At this rate the 20½ millions require 1,845 million lbs., or 23 million maunds, to provide which the 194,500 acres under garden crops and potatoes must produce about 130 maunds per acre. But the estimate of production made by Mr. Buck is only 100 maunds for potatoes and 50 maunds for other crops, which gives an out-turn of only 10½ million maunds. There is probably a combination of errors here. The area may be understated, and the estimate of produce per acre may be too low. On the other hand, it is probable that the poorer classes eat very much less of garden vegetables, and supply the deficiency in their diet by picking leaves of wild herbs and by undergrowths which are not included in the statistics of crop acreage.

VI. Spices.—The estimate of municipal consumption is 12 lbs. a head. Mr. Thornton's figure for Punjab agriculturists is 4¼ lbs. Taking the lowest estimate, the 20½ millions require 1,089,000 maunds, and there is no area specially recorded as being under these crops. Many of these are grown in "garden land," the area of which has been shown to be insufficient to account for the requisite weight of vegetables, supposing no part to be devoted to spices. A portion of the spices are probably grown in the "miscellaneous" area; but the statistics are clearly defective under this head.

VII. Oil Seeds.—The consumption of oil in municipalities is 9 lbs. per head; in villages it is probably less, say, 8 lbs.; and 8 lbs. of oil represents, roughly, 32 lbs. of oil seeds. For 20½ millions we require then 656 million lbs., or 8,200,000 maunds of oil seeds. The province, as a whole, exported in 1877–78 3½ million maunds and in 1878–79 6¼ millions. To produce the former figure alone on 311,300 acres the average out-turn per acre must be 26 maunds, which is far too large. There is little doubt that the true explanation of this discrepancy is that *oil seeds are grown to a great extent as a mixed subordinate crop* with wheat and barley as well as with cotton and joár; and Mr. Buck has reckoned that in a good year the rent of an acre of wheat, say Rs. 6, is paid by the mustard thrown in with the wheat, which must therefore produce about 2½ maunds of oil seeds.

10. The result of these considerations is to show that a great deal remains to be done by the Agricultural Department of the North-Western Provinces and Oudh before we can claim to have reduced our knowledge on these subjects to anything like exactitude. The points that especially require attention are (1) the amount of grain given to cattle; (2) the extent to which double cropping goes on; (3) the extent to which the admixture of subordinate grains and undergrowths increases the food supply of the people; (4) the consumption by the people of supplementary articles of diet, such as sugar, tobacco, vegetables, and spices; (5) the more correct classification of the highly cultivated garden crops.

11. After making all these admissions, it will be readily understood that we do not profess to be able to present any very accurate synopsis of the results of the whole agricultural industry of the province. All that can be done at present in this direction is to prepare what may be called a rough working hypothesis, which may serve to direct attention to the problems that have to be solved and to invite assistance in procuring the necessary data. With this explanation, however, it may be useful to draw up an abstract sketch of this description, by assuming that we can apply to the whole province the data and ratios which have been used with regard to the 24 districts alone.

12. The total cultivated area of the 33 districts of the North-Western Provinces (excluding the Kumaun and Garhwál districts in the Himalayas and the part of Dehra Dun which also lies in the Himalayas) is 25,344,000 acres; and taking the same ratio for double-cropped land as was found to exist in the 24 districts, or 7 per cent., the total cropped area is 27,109,000 acres. Of this (still using the ratios of the 24 districts, or 85 and 15 per cent. respectively), the area under food crops is 23,052,000 acres and under non-food crops 4,057 acres. The Oudh figures, though they do not give crop areas, are more accurate than those of the permanently settled districts of the North-Western Provinces, and they exhibit variations such as might be expected from the fact that the population is somewhat denser, the total cultivated area being 8,299,000 acres to a population of 12 millions, or nearly 1½ persons to each acre. The "dofasli" or double-cropped area is 9·1 per cent. instead of 7, and the area under food crops is larger, 87 instead of 85 per cent.—a proof that the population presses more closely on the soil for its food supply. The total area of the whole province is then as follows:—

	Acres.
Cultivated area - -	33,643,000
Double-cropped area -	2,523,000
Total cropped area - -	36,166,000
Food crops - - -	30,933,000
Non-food crops - -	5,233,000

Assuming then that on the area sown with food and non-food crops the different kinds of crops are grown in the same ratio to each other and cover the same proportionate area as in the 24 districts, of which we have more accurate statistics, we work out the following table:—

STATISTICS of NORTH-WESTERN PROVINCES and OUDH.

Food Crops.	Area in Acres.	Produce in Maunds per Acre.	Total Out-turn in Maunds.	Non-food Crops.	Area in Acres.	Value per Acre.	Total Value.
						Rs.	Rs.
Wheat	6,019·7	11·01	66,276·9	Sugar-cane	820·5	80	65,640
Barley	1,799·2	10·18	18,315·8	Cotton	783·9	20	15,678
Gram	2,451·9	8·37	20,522·4	Cotton with arhar	1387·6	10	13,876
Peas	198·3	5·97	1,183·8	Fibres	109·9	20	2,198
Wheat, mixed	3,669·2	9·35	34,307	Indigo	331·2	20	6,624
Barley, „	2,918·9	9·57	27,933·8	Fodder	670	20	13,400
Jowar	4,976·5	7·29	36,278·6	Potatoes	25·7	100	2,570
Bajra	3,364	6·35	21,361·4	Garden crops	307	30	9,210
Rice	2,505·4	11·19	28,035·4	Tobacco	55·9	50	2,795
Maize	846	11·33	9,585·2	Opium	115·6	50	5,780
Pulses	1,251	7·00	8,757	Oil seeds	534·7	20	10,694
Small millets	819	7·00	5,733	Miscellaneous	91	20	1,820
Others	113·9	7·00	797·3				
Arhar mixed	—	5·00	6,938				
Total	30,933·	9·22	286,302·6	Total	5,223	28·7	150,285

(000's omitted).

Requirements.	Mds.
Food of 41,000,000 at 5¾ maunds	235,750
Seed grain	22,994
Wastage at 5 per cent. of produce	14,220
Cattle food at ¾ maund per acre	25,232
Total requirements	296,196

According to this calculation the province does not provide enough food to meet the requirements of its inhabitants. This we know not to be the case; and therefore it follows that there is an error either in the calculation of consumption or of production. It is possible that the amount consumed has been over-rated, but this is hardly likely, considering the basis on which the calculation is made, and the fact that the average quantity of food grains consumed per head in towns is found to be 7 maunds. The error is more likely to be in the figures on the other side of the account; and it may be either in the area or in the rate of production per acre. I believe it lies in both of these figures. It has already been suggested that the double-cropped area was under estimated in the 24 districts; and probably it is still more under-rated in the more thickly populated tracts of Southern Oudh and the Benares Division. The rate of produce per acre is undoubtedly larger there than in the western districts, which included the poor soil of Bundelkhand, and it is not unreasonable to assume that if the general average for those districts is 9⅕ maunds, it should be 10 maunds for the whole province. This would give an out-turn of 309,330,000 maunds, or very slightly in excess of the requirements of the country. A further margin is required to provide for export, and for the fact that even in an average year the season is unfavourable to some crops; and this margin is obtained by assuming that the area cropped twice a year is larger by some 3 or 4 per cent. than has hitherto been supposed. If it is raised from 7 to 10 per cent. the area under food crops would be 31,450,000 acres and the out-turn 314,000,000 maunds, which gives a margin of 18,000,000 maunds, or 650,000 tons.

13. *Average Price of Food Grains.*—In order to define the average price of food grains the table below* has been compiled: 10 principal markets have been selected (Meerut, Agra, Cawnpore, Bareilly, Lucknow, Fyzabad, Allahabad, Gorakhpur, Benares, Jhansi), and the average monthly price at each of these places has been extracted from the official price currents, and the average of the 12 months has been taken as the yearly average of that place; the average of the yearly figures for the 10 markets has been taken as the average of the province. The price of small millets is not returned in the official price currents, but we shall be safe in taking them as a little cheaper than joár, say Rs. 40 per ton. With these data the money value of the crop can be calculated thus:—

Article.	Out-turn in Tons.	Rate per Ton.	Value.
	*	Rs.	Rs.
Wheat	2,368	63·6	150,072
Barley	654	45·5	29,634
Wheat and barley mixed	2,223	54·5	120,742
Gram and peas	775	52·3	40,445
Jowar and Indian-corn	1,638	48	78,624
Bajra	763	54·5	41,440
Common rice	1,001	80	80.080
Small millets and miscellaneous	233	40	9,320
Pulses	560	63·6	3,549
Total	10,215	54·3	553,906

* 000's omitted.

Taking off 10 per cent. for the difference between market prices and village prices, it may be fairly reckoned that the average price of food grains in the North-Western Provinces and Oudh during the last 10 years has been Rs. 50 per ton.

14. Turning to the non-food crops, the estimates and assumptions made as to the production and consumption of these in paragraph 9 in the case of the 24 districts may be applied to the whole area and population, and thrown into the form of a table, thus:—

*Article.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	Average of 10 years.	Average Rate per Ton.
												Rs.
Wheat	11·7	15·9	21·9	16·5	15·5	16·9	22·5	24·9	16·8	13·4	17·6	63·6
Barley	15·2	24·1	30·9	23·3	20·8	22·1	31·4	35·8	24·2	18·1	24·6	45·5
Gram	12·8	15·8	24·8	22·6	20·7	20·2	27·5	33·5	22·7	13·8	21·4	52·3
Jowar	16·3	24·3	27·5	21·2	20·8	20·6	28·9	34·9	22·6	16·3	23·3	48·
Bajra	13·5	20·9	24·8	19·	18·6	18·4	24·5	32·	20·3	13·7	20·5	54·5
Common rice	10·5	13·7	15·8	13·8	13·8	13·2	17·4	19·3	13·3	9·4	14·	80·
Arhar	11·5	16·	23·3	19·1	17·7	13·12	18·4	26·	18·14	9·	17·6	63·6

ESTIMATE of PRODUCTION and CONSUMPTION of Articles other than FOOD GRAINS for 41,000,000 of People in the NORTH-WESTERN PROVINCES and OUDH.

Articles.	Area sown.	Rate of Production per Acre.	Out-turn.	Rate of Consumption per Head per Acre.	Total Quantity required for Consumption.	Surplus for Export.	Deficit.
	Acres.	Mds.	Mds.	Lbs. Lbs.	Mds.	Mds.	Mds.
Sugar-cane	820,000	30	24,600,000	30 & 60	16,875,000	7,725,000	—
Cotton { unmixed	783,000	1½	2,215,000	4	2,050,000	165,000	—
Cotton { mixed	1,387,600	¾					
Tobacco	55,900	20	1,118,900	4	2,050,000	—	932,000
Garden vegetables	332,700	60	19,962,000	90	46,125,000	—	25,163,000
Spices	—	—	—	4¼	2,177,000	—	2,177,000
Oil seeds	534,700	10	5,347,003	32	16,400,000	—	11,053,000
Ghi	—	—	—	4¼	2,177,000	—	—
Milk	—	—	—	15	7,687,000	—	—

With regard to sugar-cane and cotton there is nothing unlikely in the results thus presented. We know that there is a very large export of sugar, though it can hardly amount to 7,725,000 maunds or 280,000 tons; and there is probably a slight export of cotton. But the figures which show a large deficit in tobacco, vegetables, spices, and oil seeds cannot be believed. There may be a small import of tobacco from Behar, but that is not certain. In the case of vegetables it is probable that the average amount consumed is overrated and should be cut down to two-thirds, or 60 lbs., while the production must be raised to 30¾ million maunds to balance even this reduced quantity. Of spices we have no figures, but probably they are for the most part grown at home. Oil seeds we know to be exported to the extent of 5 to 6 million maunds, so the actual production must be over 20 million maunds, or 700,000 tons. Ghi we export to some small extent, so the production must be about 2,250,000 maunds; and milk must be locally produced to the extent of popular need. These two items were not referred to before. The assumed rates are adopted from Mr. Thornton's Punjab estimate, and are probably not above the truth. In the case of ghi the consumption in municipal towns is found to be over 8 lbs. per head, so that the present estimate of 4 lbs. cannot be considered excessive.

15. It is possible now to frame from the data arrived at a hypothetical statement of the agricultural produce of the country, and of its value.

Produce.	Maunds.	Tons.	Rate.	Value.
	*	*	Rs.	Rs.*
Food grains	3,14,500	11,232	50 per ton	5,61,600
Sugar	24,600	880	3 per md.	22,150
Cotton	2,215	80	10 „	73,800
Tobacco	2,050	73	2·8 „	5,125
Vegetables	30,750	1,700	1 „	30,750
Spices	2,177	77	6 „	13,062
Oil seeds	19,800	700	2·8 „	49,500
Ghi	2,250	80	20 „	45,000
Milk	7,687	275	2 „	15,374
Fibres	220	8	8 „	1,760
Opium	—	—	50 per acre	5,780
Indigo	—	—	20 „	6,624
Total	—	—	—	8,30,525

* 000's omitted.

The land revenue payable by the entire province is Rs. 56,675,000, or 6·8 per cent. of the value of the agricultural produce, as estimated above.

16. Although there are so many elements of doubt in this calculation that any conclusion drawn from it can only be suggested as hypothetical and tentative, it still seems worth while to pursue the inquiry one step further, and to complete this branch of the subject by an attempt to show what the condition of the agricultural population is; what portion of the produce they raise from the land is necessary to their support; what the surplus is, and what share of this is demanded by the tax gatherer or remains to the people, to be hoarded up against an evil day or to be expended in luxuries and pleasures.

17. It is a disputed question what is the number of the agricultural population as opposed to the non-agricultural; for there is no sharp division of classes in this respect. Traders and artizans constantly hold a little land, and labourers are employed in field work and other kinds of work as occasion may offer. The question has been discussed in a separate note drawn up in reply to question 8 of chapter I., and the conclusion there arrived at was that the population of the country should be classified as follows:—

Urban and non-agricultural	3,800,000
Rural, but following trades and professions alone	4,200,000
Rural and following trades or professions conjointly with agriculture	4,200,000
Rural and following agriculture only	29,750,000
Total	41,950,000

The persons then who raise the agricultural products are the two last classes of the population. Agriculture is their main employment and the chief, but not the sole, source of their livelihood, as some of them also add to their means of support from other sources, such as smith's work, weaving, and labouring for hire. For the present, as we are not dealing with the hill districts of Kumaun, Garhwál, or Dehra Dun, we must exclude their population also and deal only with 41 millions of people, of whom the rural and agricultural classes number 33 millions.

18. The production will be the same as in the preceding paragraph, and the consumption of 33 millions will be reckoned at the same rates as were employed before.

Articles.	Total Amount Produced.	Rate of Consumption per Head per Annum.	Total Consumption of 33 millions.	Surplus.	Value of Surplus.
	* Mds.		* Mds.	* Mds.	* Rs.
Food grains	314,500	5¾ maunds, plus seed grain, cattle food, and wastage.	245,463	69,073	123,250
		Lbs.			
Sugar-cane	24,600	30	12,375	12,225	36,675
Cotton	2,215	4	1,650	565	5,650
Tobacco	2,050	4	1,650	400	1.000
Vegetables	30,750	60	24,750	6,000	6,000
Spices	2,177	4¼	1,753	424	2,544
Oil seeds	19,800	32	13,200	6,600	15,500
Ghi	2,250	4¼	1,753	497	9,940
Milk	7,687	15	6,187	1,500	3,000
Fibres	220	—	—	220	1,760
Opium	—	—	—	—	!5,780
Indigo	—	—	—	—	6,624
Total	—	—	—	—	217,723

* 000's omitted.

The surplus produce which remains over after the requirements of the agricultural population have been fully supplied, as far as necessaries are concerned, is sold by them to rich traders dwelling in the country, and to the urban population for their consumption and for export; and the value of it is Rs. 217,723,000. Deducting 10 per cent. from the value assigned to non-food grains (the deduction having already been made from food grains) for the difference between village and town prices, the surplus will be Rs. 208,276,000.

The land revenue paid by the agricultural classes is Rs. 56,675,000, and the local and patwari cesses reckoned at 15 per cent. amount to Rs. 8,501,250, total Rs. 65,176,000. The surplus remaining therefore to the agriculturists to be spent on luxuries and on pleasures is the sum of Rs. 143,100,000, or Rs. 4 a head, or Rs. 20 per agricultural family. Looking at the province broadly, it seems that we may say that the 6½ millions of agricultural families, after providing for their own necessary requirements, such as common food and coarse clothing, and after paying land tax and cesses at the rate of Rs. 10 a piece, have a surplus to fall back on in ordinary years, amounting to Rs. 20 a piece. There are of course great differences among the different sub-divisions of this class. The tenants who pay rent instead of land revenue (rent being about double the land revenue) pay on an average Rs. 20 per family; the agricultural labourers again receive only a wage which hardly exceeds subsistence, and they pay no taxes whatever. Excluding this latter class, the landed population, who may be reckoned at 5 million families, enjoy a surplus of Rs. 26 a piece. It will be a necessary development of the supervision now exercised over agricultural statistics that in a year or two the department should be able to give the approximate number of landowners who do or do not cultivate land themselves, and of tenants who cultivate without owning land; and when this is known it will be possible to define more strictly the distribution among them of agricultural profits. Some of those who do not own or till land, as well as some of the tenants and even landowners, add to their agricultural surplus some earnings from other quarters by following trades or professions, and there are some minor sources of agricultural profit, such as meat supplied to the towns, leather, timber, and fuel, which have not been included in this account, but which, when added together, form a not immaterial increment to the income of the agricultural population.

19. These calculations represent a very reasonable amount of domestic comfort. A peasantry cannot be said to be ill off which can provide for its own necessities, and after doing this has only to pay 33 per cent. of the surplus in taxes, and is able to reserve the balance, or 66 per cent. to be hoarded or expended in luxuries. At the same time it must again be repeated that I offer these conclusions simply as the best calculations that I can frame from the imperfect data already existing; and that they will be open to revision as soon as the Agricultural Department has brought its statistics into a state of greater coherence and accuracy, a consummation which there is no doubt will, under the present director's guidance, soon be attained.

STATEMENT I.—DETAILS and PER-CENTAGES of TOTAL AREA, in ACRES.

Number.	Districts. 1.	Total Area. 2.	Total Cultivated Area. 3.	Per-centage of Cultivated Area to Total Area. 4.	Total Cultivable Area not Cultivated. 5.	Per-centage of Cultivable Area to Total Area. 6.	Total Unculti-vable Area. 7.	Per-centage of Un-cultivable Area to Total Area. 8.	General Character of Cultivable and Unculti-vable Area. 9.
		*	*		*		*		
	NORTH-WESTERN PROVINCES.								
	Meerut Division.								
	(Dehra Dun—See Hill Tracts).								
1	Saharanpur - - - -	1,422	825	58	177	13	420	29	St. O. S.
2	Muzaffarnagar - - -	1,059	700	66	208	20	151	14	S. R.
3	Meerut - - - -	1,507	1,059	69	251	17	206	14	S. R.
4	Bulandshahr - - -	1,222	850	70	246	20	126	10	S. O.
5	Aligarh - - - -	1,251	950	76	79	6	222	18	S. O.
	Total Meerut Division -	6,461	4,375	67	961	15	1,125	18	
	Rohilkhand Division.								
6	Bijnor - - - - -	1,196	650	54	290	24	256	22	J. S.
7	Moradabad - - -	1,472	900	61	242	17	330	22	J. S.
8	Bareilly - - - -	1,916	1,160	60	427	23	329	17	S. R.
9	Budaun - - -	1,275	840	66	286	22	149	12	S. R.
10	Shahjahanpur - - -	1,116	740	66	197	18	179	16	S. R.
11	Tarai - - - -	589	130	22	169	29	290	49	J. S.
	Total Rohilkhand Division -	7,564	4,420	58	1,611	22	1,533	20	
	Agra Division.								
12	Muttra - - - -	862	660	76	90	11	112	13	O. St.
13	Agra - - - - -	1,394	1,050	76	140	10	204	14	O. St.
14	Mainpuri - - -	1,086	608	56	121	11	357	33	S. O.
15	Farukhabad - -	1,100	670	61	194	18	236	21	S. O.
16	Etawah - - - - -	1,087	550	51	176	16	361	33	O. St.
17	Etah - - - -	968	620	64	157	16	191	20	S. O.
	Total Agra Division - -	6,497	4,158	64	878	13	1,461	23	

* N.B.—The figures in columns 2, 3, 5, and 7 represent thousands.

Chap. I. Qn. 3.

North-Western Provinces and Oudh.

Mr. Elliott.

STATEMENT I.—DETAILS and PER-CENTAGES of TOTAL AREA in ACRES.—*cont.*

Number.	Districts. 1.	Total Area. 2.	Total Cultivated Area. 3.	Per-centage of Cultivated Area to Total Area. 4.	Total Cultivable Area not Cultivated. 5.	Per-centage of Cultivable Area to Total Area. 6.	Total Uncultivable Area. 7.	Per-centage of Uncultivable Area to Total Area. 8.	General Character of Cultivable and Uncultivable Area. 9.
	NORTH-WESTERN PROVINCES.—*cont.*	*	*		*		*		
	(Dehra Dun—See Hill Tracts.)								
	Allahabad Division.								
18	Cawnpore - - - - -	1,496	850	57	166	11	480	32	O. St.
19	Fatehpur - - - - -	1,044	545	52	127	12	372	36	O. St.
20	Banda - - - - -	1,895	780	41	702	37	413	22	O. St.
21	Allahabad - - - - -	1,818	1,030	57	200	11	588	32	O. St.
22	Hamirpur - - - -	1,470	750	51	412	28	308	21	J. St.
23	Jaunpur (P. S.) - - -	995	580	58	320	32	95	10	O. R.
	Total Allahabad Division -	8,718	4,535	52	1,927	22	2,256	26	
	Benares Division.								
24	Azamgarh (partly P. S.) - -	1,567	936	59	201	13	430	28	O. R.
25	Mirzapur (P. S.) - - -	3,345	950	28	1,364	41	1,031	31	St. J.
26	Benares (P. S.) - - -	639	485	76	8	1	146	23	St. J.
27	Gorakhpur - - - -	2,934	2,000	68	311	10	623	22	J. R.
28	Basti - - - -	1,784	1,250	70	291	16	243	14	J. R.
29	Ghazipur (P. S.) - - -	1,391	990	71	160	11	241	18	O. R.
	Total Benares Division -	11,660	6,611	57	2,335	20	2,714	23	
	Jhansi Division.								
30	Jalaun - - - -	995	580	58	195	20	220	22	St. R.
31	Jhansi - - - -	1,003	350	35	368	37	285	28	St. R. J.
32	Lalitpur - - - -	1,246	242	19	679	54	325	27	St. R. J.
	Total Jhansi Division - -	3,244	1,172	36	1,242	38	830	26	
	Hill Division.								
33	Dehra Dun - - - -	763	73	9	83	11	607	80	J. St.
34	Kumaun - - - -	3,840	327	8	500	13	3,017	78	J. St.
35	Garhwal - - - -	3,520	120	3	500	14	2,900	82	J. St.
	Total Hill Division -	8,123	520	6	1,083	13	6,524	80	
	Grand Total North-Western Provinces.	52,267	25,791	49	10,037	19	16,443	32	
	OUDH.								
	Lucknow Division.								
36	Lucknow - - -	627	332	52	140	23	155	25	O. R.
37	Bara Banki - -	1,132	718	63	221	20	193	17	O. R.
38	Unao - - - -	1,132	596	53	303	27	233	20	O. R.
	Total Lucknow Division -	2,891	1,646	57	664	23	581	20	
	Fyzabad Division.								
39	Fyzabad - -	1,081	607	56	230	21	244	23	O. R.
40	Bahraich - - - -	1,487	810	54	551	37	135	9	J. R.
41	Gonda - - - -	1,754	1,070	61	504	29	180	10	J. R.
	Total Fyzabad Division -	4,322	2,478	57	1,285	30	559	13	
	Sitapur Division.								
42	Sitapur - - -	1,417	917	64	321	23	179	13	R. S.
43	Hardoi - - -	1,472	863	59	404	27	205	14	R. S.
44	Kheri - - - -	1,511	805	54	558	37	148	9	J. R. S.
	Total Sitapur Division -	4,400	2,585	59	1,283	29	532	12	
	Rae Bareli Division.								
45	Rae Bareli - - -	1,112	570	52	344	31	198	17	O. R.
46	Sultanpur - - -	1,041	572	55	218	21	251	24	O. R.
47	Partabgarh - - -	918	448	49	192	21	278	30	O. R.
	Total Rae Bareli Division -	3,071	1,590	52	754	24	727	24	
	Grand Total Oudh - -	14,684	8,299	57	3,986	27	2,399	16	
	Provincial Grand Total North-Western Provinces and Oudh - -	66,951	34,000	51	14,023	21	18,842	28	

* *N.B.*—The figures in columns 2, 3, 5, and 7 represent thousands.

NOTE.—In remarks column St. denotes stony; S. sandy; O. usar or reh infected land; J. jungle and forest; R. river bed, or bank, or rocky ravine. *P.S.* signifies permanently settled.

CHAP. I. QN. 3.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Elliott.

STATEMENT II.—DETAILS of CULTIVATED AREA in ACRES.

District. 1.	Total Cultivated Area. 2.	Portion of Cultivated Area bearing more than one Crop in the Year. 3.	Total Acreage under Crops in the year, *i.e.*, Total of Columns 2 and 3. 4.	Portion of Total Cropped Acreage under Food Crops. 5.	Portion of Total Cropped Area of Column 4 under other Crops. 6.	Per-centage of Food Crops to Total Cropped Acreage of Column 4. 7.	Per-centage of other Crops to Total Cropped Acreage of Column 4. 8.	Per-centage of Dofasli to Total Cultivated Area. 9.
	*	*	*	*	*			
NORTH-WESTERN PROVINCES.								
Meerut Division.								
Saharanpur - - -	825	70	895	726	169	81·1	18·9	8·5
Muzaffarnagar - -	700	37	737	580	157	78·7	21·3	5·3
Meerut - - -	1,050	100	1,150	938	212	81·5	18·5	9·5
Bulandshahr - - -	850	68	918	772	146	84·1	15·9	8.
Aligarh - - -	950	100	1,050	880	170	83·9	16·1	10·5
Total Meerut Division -	4,375	375	4,750	3,896	854	82·1	17·9	8·5
Rohilkhand Division.								
Bijnor - -	650	50	700	587	113	83·9	16·1	7·7
Moradabad - - -	900	54	954	839	115	87·9	12·1	6·
Bareilly - - -	1,160	110	1,270	1,099	171	86·5	13·5	9·4
Budaun - - -	840	50	890	788	102	88·5	11·5	6·
Shahjahanpur - - -	740	40	780	659	121	84·5	15·5	5·4
Tarai - - -	130	30	160	142	18	88·7	11·3	23·
Total Rohilkhand Division -	4,420	334	4,754	4,114	640	86·5	13·5	7·5
Agra Division.								
Muttra - - -	660	70	730	599	131	82·1	17·9	10·6
Agra - - -	1,050	60	1,110	921	189	82·9	17·1	5·7
Mainpuri - - -	608	40	648	560	88	86·5	13·5	6·5
Farakhabad - - -	670	37	707	607	100	85·8	14·2	5·5
Etawah - - -	550	65	615	501	114	81·5	18·5	11·8
Etah - - -	620	40	660	565	95	85·6	14·4	6·4
Total Agra Division -	4,158	312	4,470	3,753	717	83·9	16·1	7·5
Allahabad Division.								
Cawnpore - - -	850	60	910	721	189	79·3	20·7	7·
Fatehpur - - -	545	40	585	505	80	86·3	13·7	7·3
Banda - - -	780	25	805	666	139	82·7	17·3	3·2
Allahabad - - -	1,030	75	1,105	1,008	97	91·3	8·7	7·2
Hamirpur - - -	750	29	779	618	161	79·3	20·7	3·8
Jaunpur - - -	580	20	600	522	78	87·	13·	3·4
Total Allahabad Division -	4,535	249	4,784	4,040	744	84·5	15·5	5·2
Benares Division.								
Azamgarh - - -	936	68	1,004	862	142	86	14	7·2
Mirzapur - - -	950	40	990	866	124	88	12	4·2
Benares - - -	485	25	510	438	72	86	14	5·1
Gorakhpur - - -	2,000	150	2,150	1,899	251	88	12	7·5
Basti - - -	1,250	100	1,350	1,195	155	89	11	8·
Ghazipur - - -	990	70	1,060	912	148	86	14	7·
Total Benares Division -	6,611	453	7,064	6,172	892	87	13	6·8
Jhansi Division.								
Jalaun - - -	580	20	600	518	82	86	14	3·4
Jhansi - - -	350	10	360	300	60	83·3	16·7	2·9
Lalitpur - - -	242	8	250	205	45	82	18	3·3
Total Jhansi Division -	1,172	38	1,210	1,023	187	84·6	15·4	3·2

* The figures from columns 2 to 6 represent thousands.

Chap. I. Qn. 3.

North-Western Provinces and Oudh.

Mr. Elliott.

STATEMENT II.—DETAILS OF CULTIVATED AREA.—*cont.*

District. 1.	Total Cultivated Area. 2.	Portion of Cultivated Area bearing more than one Crop in the Year. 3.	Total Acreage under Crops in the year, *i.e.*, Total of Columns 2 and 3. 4.	Portion of Total Cropped Acreage under Food Crops. 5.	Portion of Total Cropped Area of Column 4 under other Crops. 6.	Per-centage of Food Crops to Total Cropped Acreage of Column 4. 7.	Per-centage of other Crops to Total Cropped Acreage of Column 4. 8.	Per-centage of Dofasli to Total Cultivated Area. 9.
NORTH-WESTERN PROVINCES—*cont.*								
Hill Tracts.								
Dehra Dun	73	4	77	54	23	70	29·8	5·4
Kumaun				Unknown.				
Garhwál				Unknown.				
Total Hill Tracts	73	4	77	54	23	—	—	—
Provincial Total North-Western Provinces.	25,344	1,765	27,109	23,052	4,057	85	15	7
OUDH.								
Lucknow Division.								
Lucknow	332	50	382	333	49	87	13	9·1
Bara Banki	718	70	788	688	100			
Unao	596	52	648	570	78			
Total Lucknow Division	1,646	172	1,818	1,591	227			
Fyzabad Division.								
Fyzabad	607	48	655	574	81			
Bahraich	801	82	883	768	115			
Gonda	1,070	100	1,170	1,015	155			
Total Fyzabad Division	2,478	230	2,708	2,357	351			
Sitapur Division.								
Sitapur	917	94	1,011	874	137			
Hardoi	863	57	920	797	123			
Kheri	805	60	865	748	117			
Total Sitapur Division	2,585	211	2,796	2,419	377			
Rae Bareli Division.								
Rae Bareli	570	50	620	547	73			
Sultanpur	572	50	622	541	81			
Partabgarh	448	45	493	426	67			
Total Rae Bareli Division	1,590	145	1,735	1,514	221	—	—	—
Provincial Total Oudh	8,299	758	9,057	7,881	1,176	87	13	9·1
Grand Total North-Western Provinces and Oudh.	33,643	2,523	36,166	30,933	5,233	85·5	14·5	7·5

The figures from columns 2 to 6 represent thousands.

STATEMENT No. III.—FOR TWENTY-FOUR DISTRICTS:—DETAILS OF CROP AREAS, OUT-TURN, AND REQUIREMENTS.

[N.B.—Three 0's are omitted throughout, except in the column of rate.]

MEERUT DIVISION.

	SAHARANPUR.			MUZAFFARNAGAR.			MEERUT			BULANDSHAHR.			ALIGARH.			TOTAL OF MEERUT DIVISION, EXCLUDING DEHRA.		
	Area in Acres.	Rate per Acre (in Maunds).	Out-turn in Maunds.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Average Rate of Produce.	Out-turn.
FOOD CROPS.																		
Wheat	270	10	2,700	220	10	2,200	300	11	3,300	140	11	1,540	182	11	2,002	1,112	10·56	11,742
Barley	30	9	270	15	11	165	14	11	154	20	11	220	94	11	1,034	173	10·65	1,843
Gram	100	9	900	46	9	414	110	9	990	44	9	396	47	9	423	347	9	3,123
Peas	·6	6	3·6	—	6	—	25	6	150	8	6	48	1	6	6	34·6	6	207·6
Wheat, mixed	34	9	306	26	9	234	120	10	1,200	86	10	860	58	10	580	324	9·81	3,180
Barley, "	5	9	45	—	9	—	30	10	300	170	10	1,700	121	10	1,210	326	9·98	3,255
Jowar	25	7	175	89	7	623	140	8	1,120	162	8	1,296	192	8	1,536	608	7·81	4,750
Bajra	40	6	240	20	6	120	42	7	294	70	7	490	83	7	581	255	6·76	1,725
Rice	134	10	1,340	44	10	440	24	10	240	3	10	30	7	10	70	212	10	2,120
Maize	27	9	243	26	9	234	80	12	960	50	12	600	47	12	564	230	11·31	2,601
Pulses	50	7	350	92·5	7	647·5	52	7	364	15	7	105	30	7	210	239·5	7	1,676·5
Small millets	—		—	1·5		10·5	—		—	4		28	18		126	23·5		164·5
Miscellaneous	10		70	—		—	1		7	—		—	—		—	11		77
Arhar (with cotton)	—	5	·5	—	5	2	—	5	7·5	—	5	45	—	5	350	—	5	405
Total Food Out-turn	725·6	—	6,643·1	580	—	5,090	938	—	9,086·5	772	—	7,358	880	—	8,692	3,895·6	—	36,869·6
Consumption as food at 5¾ maunds per head.	—	—	5,083	—	—	3,967·5	—	—	6,997·75	—	—	5,382	—	—	6,175·5	—	—	27,605·7
Seed grain	—	—	513·8	—	—	358·75	—	—	591·25	—	—	441	—	—	499	—	—	2,403·8
Wastage at 5 per cent. on out-turn	—	—	329·1	—	—	249·8	—	—	451·675	—	—	367	—	—	432·2	—	—	1,829·7
Food for cattle	—	—	619·	—	—	525	—	—	788	—	—	638	—	—	713	—	—	3,283·
Total	—	—	6,544·9	—	—	5,101·	—	—	8,828·7	—	—	6,828	—	—	7,819·7	—	—	35,122·2
Surplus or Deficit	—	—	+ 98·2	—	—	—11	—	—	+ 257·8	—	—	+ 530	—	—	+ 872·3	—	—	+ 1,747·4
NON-FOOD CROPS.																		
Sugar-cane	30	80	2,400	44	Same as preceding.	3,520	67	Same as preceding.	5,360	9	Same as preceding.	720	2·6	Same as preceding.	208	152·6	Same as preceding.	12,208
Cotton	25	20	500	24		480	44·5		890	33		660	21·5		430	148		2,960
Cotton and arhar	·1	10	1	—		—	1·5		15	9		90	70		700	80·6		806
Fibres	20	20	400	—		—	4		80	5		100	2		40	31		620
Indigo	·9	20	18	3		60	6		120	26		520	45·7		914	81·6		1,632
Fodder	52	20	1,040	80·5		161	60·7		1,214	30		600	12		240	235·2		4,704
Potatoes	·2	100	20	—		—	·3		30	—		—	—		—	·5		50
Garden crops	1	30	·30	2		60	5		150	7		210	7		210	22		660
Tobacco	·1	50	5	1		50	2		100	4		200	5		250	12·1		605
Opium	—	—	—	—		—	—		—	—		—	—		—	—		—
Oil seeds	25	20	500	1		20	19		380	19·1		382	4·2		84	68·3		1,366
Miscellaneous	15	20	300	1·5		30	2		40	4		80	—		—	22·5		450
Total Non-food Crops	169·3	—	5,214	157	—	5,381	212	—	8,379	146·1	—	3,562	170	—	3,076	854·4	—	26,061

ROHILKHAND DIVISION.

—	BIJNOR.			BUDAUN.			MORADABAD.			BARIELLY.			SHAJAHANPUR.			TOTAL OF DIVISION.		
	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Average Rate per Acre.	Out-turn.
FOOD CROPS.																		
Wheat	92	10	920	240	10	2,400	174	11	1,914	214	12	2,568	212	12	2,544	932	11·1	10,346
Barley	49	9½	465·5	77	10	770	53	10	530	16	10	160	25	10	250	220	9·88	2,175·5
Gram	44	7	3·8	27	9	243	40	9	360	32	9	288	41	9	369	184	8·52	1,568
Peas	1	5	5	2	6	12	2	6	12	1	6	6	1	6	6	7	5·86	41
Wheat, mixed	44	8	352	49	10	490	111	10	1,110	58	10	580	33	11	363	295	9·81	2,895
Barley, "	3	8	24	21	9	189	20	9	180	12	9	108	4	9	36	60	8·95	537
Jowar	13	7	91	102	7	714	60	7	420	56	8	448	90	8	720	321	7·45	2,393
Bajra	47	5	235	218	6	1,308	139	6	834	170	7	1,190	80	7	560	654	6·31	4,127
Rice	198	12	2,376	24	10	240	144	10	1,440	325	12	3,900	93	12	1,116	784	11·57	9,072
Maize	5	10	50	10	10	100	12	12	144	47	10	470	1	10	10	75	10·32	774
Pulses	76		532	15·5		108·5	75		525	50		350	45		315	261·5		1,830·5
Small millets	10	7	70	1	7	7	9	7	63	104	7	728	30	7	210	154	7	1,078
Miscellaneous	5		35	1·5		10·5	—		—	14		98	4		28	24·5		171·5
Arhar (under cotton)	—	5	45	—	5	260	—	5	155	—	5	115	—	5	80	—	5	655
Total Food Out-turn	587	—	5,510·5	788	—	6,852	839	—	7,687	1,099	—	11,009	659	—	6,607	3,972	—	37,665·5
Consumption as food at 5¾ maunds per head.	—	—	4,237·7	—	—	5,376·2	—	—	6,454	—	—	8,665·2	—	—	5,459·6	—	—	30,192·7
Seed grain	—	—	378	—	—	446·7	—	—	455	—	—	635·8	—	—	397·8	—	—	2,313·3
Wastage at 5 per cent. on out-turn	—	—	270·8	—	—	342·6	—	—	363	—	—	550·4	—	—	330·3	—	—	1,857·1
Food for cattle	—	—	487	—	—	630	—	—	685	—	—	870	—	—	565	—	—	3,237
Total	—	—	5,373·5	—	—	6,795·5	—	—	7,957	—	—	10,721·4	—	—	6,752·7	—	—	37,600·1
Surplus or deficit	—	—	+137	—	—	+56·5	—	—	−270	—	—	+287·6	—	—	−145·7	—	—	+65·4
NON-FOOD CROPS.																		
Sugar-cane	52	80	4,160	28	Same as preceding.	2,240	44	Same as preceding.	3,520	54	Same as preceding.	4,320	45	Same as preceding.	3,600	223	Same as preceding.	17,840
Cotton	31	20	620	5		100	10		200	14		280	—		—	60		1,200
" and arhar	9	10	90	52		520	31		310	23		230	16		160	131		1,310
Fibres	4	20	80	—		—	1		20	7		140	3		60	15		300
Indigo	—	20	—	2		40	—		—	1		20	1		20	4		80
Fodder	3	20	60	1		20	1		20	10		200	15		300	30		600
Potatoes	—	100	—	—		—	1		100	11		1,100	—		—	12		1,200
Garden crops	2	30	60	3		90	7		210	35		1,050	18		540	65		1,950
Tobacco	1	50	50	1		50	1		50	1		50	—		—	4		200
Opium	—	—	—	7		350	—		—	1		50	9		450	17		850
Oil seeds	9	20	180	1		20	7		140	8		160	13		260	38		760
Miscellaneous	2	20	40	2		40	12		240	6		120	1		20	23		460
Total Non-food Crops	113	—	5,840	102	—	3,470	115	—	4,810	171	—	7,720	121	—	5,410	622	—	26,750

AGRA DIVISION.

	MUTTRA.			AGRA.			ETAH.			FARUCKABAD.			MAINPURI.			ETAWAH.			TOTAL OF DIVISION.		
—	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Average Rate of Produce.	Out-turn.
FOOD CROPS.																					
Wheat - - -	80	12	960	154	12	1,848	106	12	1,272	183	12	2,196	152	12	1,824	35	12	420	710	12	8,520
Barley - - -	40	9	360	69	9	621	30	10	300	116	10	1,160	6	10	60	25	10	250	286	9·62	2,751
Gram - - -	55	9	495	74	9	666	21	9	189	22	9	198	11	9	99	27	9	243	210	9	1,890
Peas - - -	1	6	6	1	6	6	1	6	6	2	6	12	2	6	12	2	6	12	9	6	54
Wheat, mixed - -	13	12	156	38	12	456	89	11	979	15	11	165	60	11	660	66	11	726	281	11·18	3,142
Barley, „ - - -	120	9	1,080	146	9	1,314	58	9	522	11	10	110	113	10	1,130	115	10	1,150	563	9·42	5,306
Jowar - - -	220	7	1,540	236	7	1,652	83	7	581	95	8	760	100	7	700	110	8	880	844	7·24	6,113
Bajra - - -	32	6	192	156	6	936	126	6	756	79	7	553	51	7	357	79	7	553	523	6·39	3,347
Rice - - -	—	—	—	3	10	30	15	10	150	28	10	280	28	10	280	24	10	240	98	10	980
Maize - - -	6	12	72	6	12	72	25	12	300	29	12	348	24	12	288	14	12	168	104	12	1,248
Pulses - - -	26		182	32		224	8		56	15		105	7		49	2		14	90		630
Small millets - -	—	7	—	1	7	7	2	7	14	10	7	70	4	7	28	2	7	14	19	7	133
Miscellaneous - -	6		42	5		35	1		7	2		14	2		14	—		—	16		112
Arhar (under cotton) -	—	5	350	—	5	585	—	5	95	—	5	100	—	5	120	—	5	130	—	5	1,380
Total Food Out-turn -	599	—	5,435	921	—	8,452	565	—	5,227	607	—	6,071	560	—	5,621	501	—	4,800	3,753	—	35,606
Consumption as food -	—	—	4,197·5	—	—	7,199	—	—	4,042·2	—	—	5,234·2	—	—	4,404·5	—	—	3,846·7	—	—	28,974·1
Seed grain - -	—	—	286·1	—	—	457·6	—	—	314·1	—	—	378·2	—	—	553·1	—	—	263·2	—	—	2,052·3
Wastage - - -	—	—	273·3	—	—	430·1	—	—	267·6	—	—	298·8	—	—	281	—	—	246·7	—	—	1,797·5
Food for cattle - -	—	—	495·	—	—	797	—	—	465	—	—	402	—	—	496	—	—	412	—	—	3,067
Total - - -	—	—	5,251·9	—	—	8,883·7	—	—	5,088·9	—	—	6,363·2	—	—	5,534·6	—	—	4,768·6	—	—	35,890·9
Surplus or Deficit -	—	—	+183·1	—	—	−431·7	—	—	+138·1	—	—	−292·2	—	—	+86·4	—	—	+31·4	—	—	−284·9
NON-FOOD CROPS.																					
Sugar-cane - -	1	80	80	6	Same as preceding.	480	12	Same as preceding.	960	23	Same as preceding.	1,840	9	Same as preceding.	720	11	Same as preceding.	880	62	Same as preceding.	4,960
Cotton - - -	43	20	860	14		280	19		380	12		240	18		360	27		540	133		2,660
Ditto and arhar - -	70	10	700	117		1,170	19		190	20		200	24		240	26		260	276		2,760
Fibres - - -	1	20	20	4		80	2		40	—		—	1		20	—		—	8		160
Indigo - - -	2	20	40	7		140	10		200	18		360	12		240	20		400	69		1,380
Fodder - - -	5	20	100	27		540	16		320	—		—	7		140	14		280	69		1,380
Potatoes - - -	—	—	—	—		—	—		—	2		200	—		—	—		—	2		200
Garden crops - -	3	30	90	5		150	11		330	8		240	4		120	5		150	36		1,080
Tobacco - - -	1	50	50	2		100	1		50	3		150	1		50	1		50	9		450
Opium - - -	—	—	—	—		—	2		100	12		600	8		400	10		500	32		1,600
Oil seeds - - -	5	20	100	6		120	2		40	1		20	4		80	—		—	18		360
Miscellaneous - -	—	20	—	1		20	1		20	1		20	—		—	—		—	3		60
Total Non-food Crops -	131	—	2,040	189	—	3,080	95	—	2,630	100		3,870	88	—	2,370	114		3,060	717	—	17,050

ALLAHABAD DIVISION.

	Cawnpore.			Fatehpur.			Allahabad.			Banda.			Hamirpur.			Total of Division excluding Jaunpur.		
	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Average Rate of Produce.	Out-turn.
Food Crops.																		
Wheat	77	12	924	49	12	588	86	12	1,032	10	9	90	51	9	459	273	11·69	3,093
Barley	80	11	880	19	11	209	130	11	1,430	21	9	189	2	9	18	252	10·81	2,726
Gram	14	9	126	39	9	351	87	9	783	136	7	952	109	7	763	385	7·72	2,975
Peas	3	6	18	3	6	18	40	6	240	—	—	—	1	6	6	47	6	282
Wheat, mixed	86	12	1,032	81	11	341	150	11	1,650	161	8	1,288	262	8	2,096	690	9·28	6,407
Barley, ,,	186	10	1,860	132	10	1,320	140	10	1,400	48	8	384	40	8	320	546	9·67	5,284
Jowar	180	8	1,440	110	7	770	128	7	896	148	7	1,036	86	6	516	652	7·14	4,658
Bajra	35	7	245	27	7	189	109	7	763	40	5	200	49	5	245	260	6·31	1,642
Rice	23	12	276	76	12	912	71	12	852	29	10	290	1	8	8	200	11·69	2,338
Maize	26	12	312	1	12	12	1	12	12	—	—	—	—	8	—	28	12	336
Pulses	3	7	21	3	7	21	21	7	147	20	7	140	8	7	56	55	7	385
Small millets	3		21	15		105	45		315	53		371	9		63	125		875
Miscellaneous	5		35	—		—	—		—	—		—	—		—	5		35
Arhar (under cotton)	—	5	255	—	5	205	—	5	75	—	5	575		5	185	—	5	1,295
Total Food Out-turn	721	—	7,445	505	—	5,041	1,008	—	3,595	666	—	5,515	618	—	4,735	3,518	—	32,331
Consumption as food	—	—	6,647	—	—	3,817·4	—	—	8,028·1	—	—	4,011·2	—	—	3,042·3	—	—	25,546
Seed grain	—	—	426·8	—	—	291·7	—	—	599·2	—	—	336·7	—	—	383·8	—	—	2,043·2
Wastage	—	—	376·1	—	—	252	—	—	479·7	—	—	272·1	—	—	235·9	—	—	1,615·8
Food for cattle	—	—	637	—	—	409	—	—	772	—	—	585	—	—	562	—	—	2,965
Total	—	—	8,086·9	—	—	4,770·1	—	—	9,879	—	—	5,205	—	—	4,229	—	—	32,170
Surplus or Deficit	—	—	−644·9	—	—	+270·9	—	—	−284	—	—	+310	—	—	+506	—	—	+161
Non-food Crops.																		
Sugar-cane	9	80	720	6	Same as preceding.	480	12	Same as preceding.	960	—	Same as preceding.	—	5	Same as preceding.	400	32	Same as preceding.	2,560
Cotton	25	20	500	4		80	10		200	12		240	27		540	78		1,560
,, and arhar	51	10	510	41		410	25		250	115		1,150	37		370	269		2,690
Fibres	2	20	40	2		40	1		20	1		20	2		40	8		160
Indigo	33	20	660	2		40	2		40	—		—	1		20	38		760
Fodder	44	20	880	—		—	3		60	1		20	—		—	48		960
Potatoes	—	—	—	—		—	1		100	—		—	—		—	1		100
Garden crops	14	30	420	19		570	10		300	2		60	3		90	48		1,440
Tobacco	1	50	50	1		50	2		100	1		50	1		50	6		300
Opium	7	50	350	4		200	6		300	1		50	—		—	18		900
Oil seeds	3	20	60	1		20	25		500	6		120	80		1,600	115		2,300
Miscellaneous	—	20	—	—		—	—		—	—		—	5		100	5		100
Total Non-food Crops	189	—	4,190	80	—	1,890	97	—	2,830	139	—	1,710	161	—	3,210	666	—	13,830

JHANSI DIVISION.

	Jhansi.			Jalaun.			Lalitpur.			Total of Division.			Grand Total of the 24 Districts.		
—	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Rate per Acre.	Out-turn.	Area.	Average Rate of Produce.	Out-turn.	Area.	Average Rate of Produce.	Out-turn.
Food Crops.															
Wheat	81	8	648	3	8	24	34	8	272	118	8	944	3,145	11·01	34,645
Barley,	1	9	9	4	9	36	4	9	36	9	9	81	940	10·18	9,576·5
Gram	48	7½	360	83	7½	622·5	24	7½	180	155	7½	1,162·5	1,281	8·37	10,718·5
Peas	1	6	6	5	5	25	—	6	—	6	5·17	31	103·6	5·97	615·6
Wheat, mixed	48	7	336	262	7	1,834	17	8	136	327	7·05	2,306	1,917	9·35	17,930
Barley, "	2	9	18	28	7	196	—	9	—	30	7·13	214	1,525	9·57	14,596
Jowar	77	6	462	75	6	450	23	6	138	175	6	1,050	2,600	7·29	18,964
Bajra	13	5	65	53	5	265	—	9	—	66	5	330	1,758	6·35	11,171
Rice	2	8	16	1	8	8	12	10	120	15	9·6	144	1,309	11·19	14,654
Maize	—	8	—	—	8	—	5	10	50	5	10	50	442	11·33	5,009
Pulses	—		—	—		—	10		70	10		70	656		
Small millets	27	7	189	4	7	28	76	7	532	107	7	749	428·5	7	7,987
Miscellaneous	—		—	—		—	—		—	—		—	56·5		
Arhar (under cotton)	—	5	65	—	5	190	—	5	6	—	5	255	—	5	4,038
Total Food Out-turn	300	—	2,174	518	—	3,678·5	205	—	1,534	1,023	—	7,386·5	16,161·6	9·20	149,896·6
Consumption as food	—	—	1,827·3	—	—	2,325·8	—	—	1,222·4	—	—	5,375·5	—	—	117,694·0
Seed grain	—	—	169·3	—	—	318·5	—	—	99·6	—	—	587·4	—	—	9,400·0
Wastage	—	—	106·0	—	—	177·8	—	—	72·7	—	—	356·5	—	—	7,456·6
Food for cattle	—	—	262	—	—	435	—	—	182	—	—	879	—	—	13,431
Total	—	—	2,364·6	—	—	3,257·1	—	—	1,576·7	—	—	7,198·4	—	—	147,981·6
Surplus or Deficit	—	—	—	—	—	—	—	—	—	—	—	188·1	—	—	1,915
Non-food Crops.															
Sugar-cane	—	80	—	2	Same as preceding.	160	6	Same as preceding.	480	8	Same as preceding.	640	477·6	Same as preceding.	38,108
Cotton	15	20	300	20		400	2		40	37		740	456·0		9,120
" and arhar	13	10	130	38		380	—		—	51		510	807·6		8,076
Fibres	1	20	20	1		20	—		—	2		40	64·0		1,280
Indigo	—	20	—	—		—	—		—	—		—	192·6		3,852
Fodder	1	20	20	7		140	—		—	8		160	390·2		7,804
Potatoes	—	100	—	—		—	—		—	—		—	15·5		1,550
Garden crops	2	30	60	6		180	—		—	8		240	179·0		5,370
Tobacco	—	50	—	1		50	—		—	1		50	32·1		1,605
Opium	—	50	—	—		—	—		—	—		—	67·0		3,350
Oil seeds	28	20	560	7		140	37		740	72		1,440	311·3		6,226
Miscellaneous	—	20	—	—		—	—		—	—		—	53·5		1,070
Total Non-food Crops	60	—	1,090	82	—	1,470	45	—	1,260	187	—	3,820	3,046·4	—	87,411

CHAP. I. QN. 3.

BENGAL.

Mr. Toynbee.

BENGAL.

Such figures as are available by way of reply to the first part of the Commission's third question are given in tabular form in the accompanying statement. They are taken chiefly from returns which are prepared by district officers (in Form XLI. B.), and submitted annually to Government through the Board of Revenue. They cannot be regarded as being more than the best approximation to the truth which collectors are able to make. The preparation of accurate general agricultural statistics, such as those indicated in this question, is at present impossible in these provinces.

Really accurate agricultural statistics could only be collected in these permanently settled provinces by detailed inquiries of great extent, following a cadastral survey, and involving much delay and enormous expense to Government. In the absence of any village organization, such as that which exists in the North-Western Provinces, it would be necessary to entertain a special and costly establishment to record the information required.

As regards produce per acre, so various are the soils, so different is the rainfall, so numerous are the modes of cultivation, the crops and their out-turn in the various districts of Bengal, that it is quite impossible to fix any absolute standard figure representing the average out-turn of an acre of land under any given food crop. As a rule the cultivators themselves do not know it with any tolerable degree of accuracy. From such experiments and inquiries as have been made in Bengal from time to time, and after analysing all the statistics available on the subject, Captain Ottley, R.E., came to the conclusion that as regards rice—the great staple crop of Bengal—"the average out-turn for a number of years of all classes of land will be about 15 maunds per acre." This may be accepted as the nearest possible approximation to the truth, but not as a safe basis for calculation. As regards export from, and import into, his district, a collector can only say generally whether grain is going out of or coming into it, or both. If there is a railway or a navigable river running through it he can roughly gauge the imports and exports at certain fixed points and obtain figures which may be of use to him in forming a general view of the state of his district: beyond this he cannot go. Even if funds were available, trustworthy agency would be wanting. A system of inter-district traffic registration, by which the exports from and imports into each district could be ascertained with any degree of accuracy, has never been attempted and would be quite impossible in Bengal.

An attempt has already been made to work out statistics such as those indicated by the Committee in their third question. The result is given in a work of over 300 pages by Mr. A. P. MacDonnell, C.S., entitled "Report on the food grain supply and statistical review of the relief operations in the distressed districts of Behar and Bengal during the famine of 1873–74." Such figures as Mr. MacDonnell worked out for production, consumption and export have been reproduced in the statement on the following page, but as, after a careful and laborious examination of all the sources of information available, he rejected all the others as worthless and liable to mislead, they have not been here worked out for the Commission. Mr. MacDonnell has, in the introduction to his work, fully explained in detail the process by which he has arrived at his figures, and it is not necessary to recapitulate them. He says, "No other character, however, than approximations to the truth is claimed for these estimates . . . . . This question of average rates of produce has been one of the most perplexing with which I have had to deal. *One maund, more or less, per acre may alter the complexion of a conclusion.*" A glance at Appendix No. III. to Mr. MacDonnell's work will show how hopeless is the task of arriving at a safe figure of produce per acre amid so wide a range of estimates; and when it is considered that the figures for the consumption per head of the population are merely approximations, it will be seen how impossible is the task of attempting to give accurate and reliable agricultural statistics without a cadastral survey and detailed field to field inquiries. As the settlement of these provinces is permanent, the cost of such a procedure, which is the only one by which really reliable figures could be obtained, would perhaps be out of all proportion to the value of its results. It would give no increase of revenue; it would alarm the people, and the landholders would throw every obstacle in the way of our obtaining the information sought for.

In 1872–73 special inquiries were made by Native deputy collectors with a view of collecting agricultural statistics for the selected districts of Jessore and Rungpore. The results of these inquiries are embodied in two volumes full of interesting and useful information, but as it was not based on a cadastral survey it possesses *per se* little or no real statistical value. This method of collecting agricultural statistics has not therefore been extended to other districts. The mode of procedure adopted—whereby deductions are made for the whole district from the results of inquiries made in portions of it—is not adapted to a province like Bengal, where not only each district but also each pergunnah of every district, may present features differing essentially from those of neighbouring and adjoining districts and pergunnahs.

CHAP. I. QN. 3.

BENGAL.

Mr. Toynbee.

STATEMENT showing details of Cultivation, &c.

Division. 1.	District. 2.	Total Area of District in Acres. 3.	Estimated Cultivated Area in Acres.			Estimated Average Out-turn per Acre in Maunds of			Total estimated quantity of Food Grain produced in the District. 10.	Total estimated amount required for Food and Seed in the District. 11.	Balance available for Export. 12.
			Food Crops. 4.	Other Crops. 5.	Total. 6.	Rice. 7.	Bhadoi. 8.	Rubbee. 9.			
									Tons.	Tons.	Tons.
Burdwan	Burdwan	2,211,200	1,894,680	115,000	2,009,680	—	—	—	—	—	—
	Bankoora	910,080	406,000	17,000	423,000	13	4	4	195,000	131,000	64,000
	Beerbhoom	860,160	556,400	10,000	566,400	—	—	—	—	—	—
	Midnapore	3,252,480	1,927,000	382,000	2,309,000	—	—	—	—	—	—
	Hooghly with Howrah	938,880	709,050	109,700	818,750	—	—	—	—	—	—
Presidency	24 Pergunnahs	1,784,320	973,387	63,098	1,036,485	—	—	—	—	—	—
	Nuddea	2,189,440	914,538	149,182	1,063,720	—	—	—	—	—	—
	Jessore	2,341,120	1,704,900	79,400	1,784,300	—	—	—	—	—	—
	Moorshedabad	1,575,680	881,000	108,000	989,000	15	12	12	457,000	327,000	130,000
Rajshahye	Dinagepore	2,640,640	1,353,000	336,000	1,689,000	12	—	—	574,000	383,000	191,000
	Rajshahye	1,429,760	696,064	190,802	886,866	—	—	—	—	—	—
	Rungpore	2,224,640	1,644,000	290,000	1,934,000	15	7	10	801,000	501,000	300,000
	Bogra	960,640	848,423	115,617	964,040	—	—	—	—	—	—
	Pubna	1,265,920	409,525	30,317	439,842	—	—	—	—	—	—
	Darjeeling	—	—	—	—	—	—	—	—	—	—
	Julpigoree	1,859,840	300,940	49,779	350,719	—	—	—	—	—	—
Dacca	Dacca	1,789,440	1,171,248	125,265	1,296,513	—	—	—	—	—	—
	Furreedpore	1,439,360	650,440	54,200	704,640	—	—	—	—	—	—
	Backergunge	2,334,720	2,174,213	232,421	2,406,634	—	—	—	—	—	—
	Mymensingh	4,031,360	1,278,476	151,988	1,430,464	—	—	—	—	—	—
	Tipperah	1,574,400	1,148,364	122,285	1,270,649	—	—	—	—	—	—
Chittagong	Chittagong	1,486,080	536,802	7,838	544,640	—	—	—	—	—	—
	Noakholly	1,185,280	660,186	42,954	703,140	—	—	—	—	—	—
	Chittagong Hill Tracts	—	—	—	—	—	—	—	—	—	—
Patna	Patna	1,344,640	1,116,257	46,896	1,163,153	—	—	—	—	—	—
	Gya	3,018,240	1,640,000	88,000	1,728,000	12	8	10	640,000	520,000	120,000
	Shahabad	2,806,400	1,610,000	80,000	1,690,000	12	8	12	670,000	462,000	208,000
	Durbhunga	1,922,560	1,964,009	85,000	2,049,009	13	12	8	861,000	620,000	241,000
	Mozufferpore	2,134,400	1,712,000	104,000	1,816,000	12	12	10	751,000	578,000	173,000
	Sarun	1,698,560	2,042,000	278,000	2,320,000	10	9	9	671,000	547,000	124,000
	Chumparun	2,259,840	1,308,000	129,000	1,437,000	12	7	7	517,000	352,000	165,000
Bhagulpore	Monghyr	2,510,080	1,802,000	150,000	1,952,000	12	11	11	658,000	484,000	174,000
	Bhagulpore	2,731,520	2,326,890	509,071	2,835,961	—	—	—	—	—	—
	Purneah	3,172,480	1,300,823	285,534	1,586,357	—	—	—	—	—	—
	Maldah	1,160,320	353,390	89,232	442,622	—	—	—	—	—	—
	Sonthal Pergunnahs	3,512,320	682,619	132,588	815,207	—	—	—	—	—	—
Orissa	Cuttack	2,888,320	1,237,900	112,100	1,350,000	15	—	—	—	—	—
	Pooree	1,582,080	640,185	24,135	664,320						
	Balasore	1,323,520	545,859	37,400	583,259						
Chota Nagpore	Hazareebagh	4,493,440	1,196,624	122,288	1,318,912	—	—	—	—	—	—
	Lohardugga	7,708,160	2,552,359	271,379	2,823,738	—	—	—	—	—	—
	Singbhoom	2,494,080	571,346	64,302	635,648	—	—	—	—	—	—
	Manbhoom	3,149,440	1,193,600	619,200	1,812,800	—	—	—	—	—	—
	Total	92,196,240	48,634,497	6,010,971	54,645,468	—	—	—	6,795,000	4,905,000	1,890,000

(1) *Note.*—Each acre double cropped is counted as two acres.

(2) Column 11 is calculated by Mr. MacDonnell on the supposition that, in Behar, every head of the population consumes three-fourths of a seer and in Bengal two-thirds of a seer daily, and that for seed 10 seers for *bhadoi* and 30 seers for rice and *rabi* per acre are required in Behar, and one maund for rice and 10 seers for other crops in Bengal. See pp. 8, 217, 218

CHAP. I. QN. 3.

CENTRAL PROVINCES.

Mr. Nicholls.

CENTRAL PROVINCES.

The required statistics are given in the following tables:—

CROPS CULTIVATED IN ACRES.

Districts.	Rice.	Wheat.	Other Food Grains.	Oil Seeds.	Sugar-cane.	Cotton.	Opium.	Indigo.	Fibres.	Tobacco.	Vegetables.	Others.
Nagpur	32,887	269,473	551,493	191,483	1,656	120,449	37	—	1,200	958	12,103	7,640
Bhandara	426,605	69,368	249,346	49,018	8,599	24	—	—	468	144	4,365	640
Chanda	227,276	53,799	271,609	85,931	5,996	36,330	—	—	1,642	1,486	9,777	—
Wardha	2,035	170,173	345,577	154,228	689	222,421	29	—	1,932	1,403	1,206	3,497
Balaghat	308,302	16,659	111,604	24,577	2,363	—	—	—	28	883	923	161
Upper Godavari	4,227	236	16,302	1,713	6	635	—	—	—	252	—	—
Jubbulpore	155,894	370,421	389,069	91,362	2,057	22,565	449	—	1,755	348	1,743	891
Saugor	15,772	465,375	209,171	64,265	4,052	28,384	91	3	1,269	819	2,452	4,085
Damoh	55,501	196,047	180,006	35,714	877	12,788	5	256	676	661	1,132	2,354
Seoni	100,589	274,005	190,925	39,211	1,058	9,336	139	—	2,888	74	554	—
Mandla	75,283	80,035	228,823	20,630	830	657	—	—	3,174	604	332	37
Chhindwara	3,974	144,323	311,651	66,443	9,543	40,928	517	—	718	—	1,515	—
Hoshangabad	18,021	566,988	195,460	66,600	10,375	23,639	182	—	518	951	1,108	38,143
Narsinghpur	27,413	261,776	257,515	8,888	2,384	54,926	24	30	1,266	614	1,517	1,077
Betul	17,318	189,246	382,758	59,047	8,577	2,209	1,871	—	3,601	110	2,425	6
Nimar	13,128	12,455	270,508	32,331	289	38,272	173	—	2,329	134	889	1,335
Raipur	1,175,870	266,837	555,273	185,162	33,059	82,547	—	—	1,118	36,919	4,819	10,612
Sambalpur	990,590	—	212,250	106,666	4,875	49,827	—	—	1,500	2,681	5,110	2,228
Bilaspur	872,985	73,906	179,420	67,100	10,520	56,500	—	—	—	—	—	—
Total	4,523,670	3,471,122	5,058,760	1,350,397	107,805	802,437	3,517	289	26,082	49,041	51,970	72,706

GENERAL STATEMENT showing the AVERAGE PRODUCE and LOCAL CONSUMPTION with Amount available for EXPORT of EDIBLE GRAINS in the CENTRAL PROVINCES, compiled from the Statements received from District Officers.

Districts.	Area Cultivated with Edible Grain in Acres.			Total Acreage Edible Grains.	Average Produce per Acre in Lbs.			Produce of each Grain in Lbs.			Total Produce.		Population.	Local Consumption in Maunds.				Available for Export.	
	Rice.	Wheat.	Others.		Rice.	Wheat.	Others.	Rice.	Wheat.	Others.	Lbs.	Maunds.		Food at 5 Maunds per Head per Annum.	Seed at 1¼ Maunds per Acre for Rice, 1 for Wheat, and ¾ for Others.	Sundries, Cattle Wastage, &c., ½ Maund per Person.	Total.	Maunds.	Tons.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
Nagpur	32,887	269,473	551,493	853,853	600	450	364	19,732,200	121,262,850	200,849,850	341,844,900	4,273,061	631,109	3,155,545	724,202	315,555	4,195,302	77,759	2,777
Bhandara	426,605	69,368	249,343	745,319	600	300	300	255,963,000	20,810,400	74,803,800	351,577,200	4,394,715	564,813	2,824,065	789,634	282,407	3,896,106	498,609	17,807
Chanda	227,276	53,799	271,609	552,684	750	480	400	170,457,000	25,823,520	108,643,600	304,924,120	3,811,551	534,431	2,672,155	541,600	267,216	3,480,971	350,580	12,244
Wardha	2,035	170,173	345,577	517,785	400	450	435	814,000	76,577,850	150,325,560	227,717,410	2,846,467	354,720	1,773,600	431,897	177,360	2,382,857	463,610	16,557
Balaghat	308,302	16,659	111,604	436,565	520	400	300	160,317,040	6,663,600	33,481,200	200,461,840	2,505,773	302,482	1,512,460	485,740	151,241	2,149,391	356,382	12,728
Upper Godavari	4,227	236	16,302	20,765	600	450	400	2,536,200	106,200	6,520,800	9,163,200	114,540	52,120	260,600	17,610	26,060	304,270	—189,730	—6,776
Jubbulpore	155,894	370,421	389,069	915,384	373	633	406	54,200,428	234,484,179	158,048,475	446,733,082	5,584,163	528,859	2,644,295	857,090	264,429	3,765,814	1,818,349	64,941
Saugor	15,772	455,375	209,171	680,318	560	480	582	8,832,320	218,580,000	121,353,780	348,766,100	4,359,576	527,725	2,638,625	631,968	263,863	3,534,456	825,120	29,468
Damoh	55,501	196,047	130,006	381,584	720	460	322	39,960,720	90,181,620	41,861,932	172,004,272	2,150,053	269,642	1,348,210	362,928	134,821	1,845,959	304,094	10,860
Seoni	100,589	274,005	190,925	565,519	625	500	400	65,052,600	137,002,500	76,370,000	278,425,100	3,480,313	299,856	1,499,280	542,934	149,928	2,192,142	1,288,171	46,006
Mandla	75,283	80,035	228,823	384,141	500	450	500	37,641,500	36,015,750	114,411,500	188,068,750	2,350,859	213,018	1,065,090	345,756	106,509	1,517,355	833,504	30,770
Chhindwara	3,974	144,323	311,651	459,948	600	500	500	2,384,400	72,161,500	155,825,500	230,371,400	2,879,642	316,095	1,580,475	383,028	158,048	2,121,551	758,091	28,077
Hoshangabad	18,021	566,988	195,460	780,469	528	440	302	9,083,904	255,757,440	61,392 953	326,234,297	4,077,928	449,977	2,249,885	736,169	224,989	3,210,983	866,945	30,962
Narsinghpur	27,413	261,776	257,515	546,704	400	480	467	10,965,200	125,652,480	120,341,440	256,959,120	3,211,989	339,595	1,696,975	489,178	169,698	2,355,851	856,138	30,576
Betul	17,318	189,246	332,758	539,322	500	480	400	8,659,000	90,838,080	153,103,200	252,600,280	3,157,503	274,264	1,371,320	526,979	137,132	2,035,431	1,122,072	41,558
Nimar	13,128	12,455	270,508	296,181	700	640	400	9,189,600	7,971,200	108,203,200	125,364,000	1,567,050	211,176	1,055,880	231,814	105,588	1,393,282	173,768	6,436
Raipur	1,175,870	266,837	555,273	1,997,980	[illegible]	560	716	940,696,000	149,428,720	397,575,468	1,487,700,188	18,596,252	1,093,405	5,467,025	2,153,129	546,703	8,166,857	10,429,395	372,478
Sambalpur	990,590	—	212,250	1,202,840	480	—	480	475,483,200	—	101,880,000	577,363,200	7,217,040	523,034	2,615,170	1,397,427	261,517	4,274,114	2,942,926	105,104
Bilaspur	872,985	73,906	179,420	1,126,311	480	560	480	419,032,800	41,387,360	86,121,600	546,541,760	6,831,772	715,398	3,576,990	1,299,702	357,699	5,234,391	1,597,381	57,040
Total	4,523,670	3,471,122	5,058,760	13,053,672	459	434	431	2,691,001,000	1,710,705,000	2,271,113,858	6,672,820,219	83,410,247	8,201,519	41,007,595	12,948,725	4,100,763	58,057,083	25,353,164	939,006

ART. I. QN. 3.

CENTRAL
ROVINCES.

r. Nicholls.

The tables are founded on the annual village papers prepared by the patwaris showing the area and crop cultivated in each field. Great trouble is taken to get patwaris to give correct returns, or in those districts where there are no patwaris, to obtain them from the malguzars. Probably the total areas under each kind for fields long under cultivation are pretty correctly given. Where two or more crops are grown in the same field the difficulty is greatly increased; and probably in districts where the area of cultivation is rapidly extending; the newly broken lands are sometimes omitted for a year or so. Accordingly I am inclined to think that our area is under stated.

The averages of produce are taken from the settlement reports, and represent the produce of average good years. In a few cases experience has led us to reduce the out-turn factor. I think our figures are within the mark as to average produce.

The local consumption has been calculated thus:—for each head of population, men, women, and children, 5 maunds each per annum, or daily for a man 1½ lb., for a woman 1 lb., for a child ¾ lb. This on our population gives close on 5 maunds. To this is added for seed, rice 1¼ maund, wheat 1 maund, and others ¾ maund, for each area cultivated. Provision has also been made for wastage, food for cattle, &c., at ½ a maund per head of population. The vegetables generally consumed, with the condiments, with fish, and animal food now and then obtained, give a fair addition to the grain supposed to represent the average consumption.

No deduction has been made on account of the jungle fruits and gums, and roots, always available for a part of the year to the forest tribes. Again, as a source of food supply, mhowa is of very great importance. I have done my best to form an estimate of the quantity which, as a minimum might be consumed in ordinary years; but I cannot venture on figures. In Betul it is consumed for some three or four months of the year by those who eat it, probably every other day.*

The following extract of a letter just now received by me (7th August 1878) shows how mhowa is now regarded in the Seoni District:—

"I now beg to submit for your perusal two petitions submitted by Kallars of Lakhnadon, praying that the rate of duty on *mhowa* may be reduced.

"They urge the high price at which mhowa is selling, owing partly to export and partly to the fact that it is largely used for food; also that the price of 20 seers of mhowa is Rs. 1–4, or 4 annas per 'kuru.'

"They also beg that Government will supply them with mhowa.

"Inquiry made here shows that the following mahajans have exported mhowa to Nagpur and Kamptee as follows:—

	Exported. Khandies.	In stock. Khandies.
Madhopershad -	1,000	100
Murlidhar - -	500	20
Ramji, Marwari -	1,500	100
Sewaji - -	200	—
Sookh Lal - -	1,000	100
Moona Lal - -	200	—
Kirparam - -	500	—
	4,900	320

"It is also undoubted that zamindars have made large purchases to feed their tenants, for instance Goolab Singh of Darasi purchased 1,000 khandies, and others have done the same.

"The consequence is that the price of mhowa has enormously risen, being in many places 5 or 6 rupees a khandi, and the Kallars who have been accustomed to buy at 1 rupee to 2 rupees a khandi feel the rise severely, especially as they are unable to raise the price of liquor, owing to the generally impoverished condition of the drinking classes."

From inquiries at Nagpur, it appears that much mhowa intended for the Bombay Presidency, but countermanded, has accumulated in the city. Only a small portion was despatched by railway. Such purchases in the Satpura districts would be likely to create alarm, if not panic.

I have made no deduction for this large substitution of mhowa in place of cereals, and this will, I think, compensate for an unknown or rather uncertain increment to the population since the date of the census of January 1872.

There is also some amount of cultivation in the unsettled Government waste lands, which now produces grain and other crops; of this I have no statistics, and its produce has been excluded from the statement.

The Settlement Officer of Nimar in 1870 wrote that the district imported a considerable part of its food. I, therefore, am doubtful of my figures for Nimar. For the rest, I consider that we have fairly reliable statistics, and I cannot see any way of improving them till the Central Provinces Revenue Bill, now before the Government of India, shall have been passed.

Since writing the above I have received the following account, based on the experience of the Native Assistant Commissioner for the the Balaghat District. Out of a total population of 325,000 people about 100,000 people use mhowa as food from June to April, and between 70,000 and 80,000 maunds of mhowa are thus consumed, the daily allowance may be stated at about 4 chittacks.

Of the minor forest produce about 5,000 maunds of semat* and kanhikund† are used for food.

About 80,000 maunds of cereals may be deducted. That is, it is estimated that the saving of cereals through the consumption of the crops of mhowa and forest produce amounts to 2,962 tons annually. My own impression is that it is very generally consumed in ordinary years from the middle of May to the end of September, and then forms about a third part of the food consumed by those who at all use it as food.

In Saugor the cost of mhowa is now two and a half times as high as is usual, and in Hoshangabad the Kallars are in difficulties owing to the enhanced cost, although it is believed that the crop was far from scanty.

The Deputy Commissioner of Sambalpur writes:—

"There is at present not sufficient information to enable me to submit an estimate of how many people make use of mhowa as food. Mr. Russell (late settlement officer), while out marching, evidently made some inquiries, for in his diary of the 10th February he writes: 'Here the staple rice is supplemented by mhowa, which in the jungly parts constitutes the only food for about two months, sub-jungly for one month; other grains, beans, &c. for another month; and in the very wild parts, roots and tubers resembling in appearance sweet potatoes.'

"The Raja of Rehrakol told me that in his state no one ever died of hunger, because the jungles furnished ample supplies of fruit, roots, leaves, &c., on which they subsist when grain is scarce and not within their reach."

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* Total population - - 8,201,519
Forest tribes - - - 1,494,087
Bhil, Bhilal, Kol, Kurku, Gond, Meria, Khond, Byga, Barras, Sond, and others.

* Bombax malabaricum. † Tacca pinnatifida. (?)

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BERAR.

In the following tables I give :- 1st the average area under cultivation during the past four years; and 2nd the estimated out-turn and consumption of grain, and the surplus that remains for export.

A.

AVERAGE CULTIVATION in each DISTRICT.

Districts.	Edible Grains.								Other Crops.								Grand Total.
	Jowari.	Wheat.	Bajri.	Gram.	Rice.	Tur.	Urid.	Total.	Cotton.	Linseed.	Til.	Lac.	Kurdi.	Tobacco.	Other Products.	Total.	
Amraoti -	490,375	115,811	654	21,777	1,249	10,714	1,070	641,650	492,305	61,793	36,706	16,983	2,093	11,455	67,449	688,784	1,330,434
Akola - -	471,359	65,850	19,576	26,537	407	22,055	5,894	611,678	534,690	40,725	24,970	15,246	850	3,138	78,066	697,685	1,309,363
Ellichpur -	199,370	43,649	685	15,354	7,769	20,622	3,024	290,473	222,822	16,727	10,279	6,826	1,233	6,139	36,152	300,178	590,651
Buldana -	348,384	137,221	84,130	41,748	6,328	9,165	2,369	629,345	280,821	13,030	24,144	4,269	25,663	2,518	86,143	436,588	1,065,933
Wun - -	439,886	32,708	339	12,663	2,373	18,118	3,393	509,480	244,534	15,557	22,631	2,905	32	1,949	80,041	367,649	877,129
Basim -	296,182	103,099	6,207	67,645	14,238	16,038	20,180	523,589	184,219	2,966	26,149	24,595	24,456	2,515	146,518	411,418	935,007
Total in province.	2,245,556	498,338	111,593	185,722	32,364	96,712	35,930	3,206,215	1,959,391	150,798	144,879	70,824	53,327	27,714	494,369	2,902,302	6,108,517

B.

GENERAL STATEMENT showing the AVERAGE PRODUCE and estimated LOCAL CONSUMPTION with amount available for EXPORT.

——	Average cultivated with Edible Grains in Acres.			Total Average cultivated with Edible Grains.	Average Produce per Acre in Lbs.			Produce of each Grain in Maunds.				Local Consumption in Maunds.			Available for Export.	
	Jowari.	Wheat.	Other Grains.		Jowari.	Wheat.	Other Grains.	Jowari.	Wheat.	Other Grains.	Total.	Food at 5 Maunds per Head per Annum.	Seed at 12 lbs. per Acre.	Total.	Maunds.	Tons.
Total in province	2,245,556	498,338	462,321	3,206,215	420	250	250	11,789,169	1,557,306	1,444,753	14,791,228	11,138,270	962,034	12,100,304	2,690,926	94,676

The area returns are compiled from returns rendered by the village patwaris, and may be accepted as correct.

The other figures are merely approximate estimates.

The district estimates of the out-turn of produce vary very greatly.

In 1866–67 the estimate for the chief crops was as follows :—

——		heat.	Rice.
Amraoti - - -	356	227	156
Akola - - -	188	134	63
Ellichpur - - -	356	206	90
Buldana - - -	283	166	128
Wun - - -	299	234	275
Basim - - -	350	260	200
Total - -	305½	204½	152

A series of experiments carried out some years ago by the survey officers to ascertain the out-turn of jowari gave the following results :—

Officer who experimented.	Highest yield.	Lowest yield.	Average yield.
	Lbs.	Lbs.	Lbs.
Colonel Elphinstone -	1,842	488	1,165
Major Mackenzie - -	1,484	415	949
Captain Pemberton -	1,980	840	1,410
Mr. Jambull -	945	580	762
Mr. Morans -	1,120	880	1,000
Average - -	1,474	41	57

Colonel Nembhard, in referring to these experiments wrote as follows :—

"The land which yielded 1,842 lbs. is stated by Colonel Elphinstone to have been very superior, and it had been manured. The lowest yield met with by any of these officers was 415 lbs. Mr. Pemberton's experiments were carried out in the Morsi Taluka, where the soil is good and retentive of moisture, and it will be observed that his averages are higher than those of any other officer.

"As a rule, I think we get as good information from respectable landowners, who are civilized enough to know that our inquiry proceeds from no motive inimical to their interests, as from any tests which we ourselves have the leisure to apply, and from them I learn that an acre of millet (jowari) grown on fairly good land, and in an ordinary good season, yields from 9 to 10 maunds of grain, say 800*l*. This would be in the better sorts of the valley. Of course in the thinner and poorer soils of districts above the Ghats the average yield would be much smaller, probably not more than about 500*l*."

The actual results obtained on the Government farms, which were under the supervision of professional European gardeners, are shown below :—

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Berar.

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Years.	Farm.	Rainfall.	Out-turn.		
			Jowari.	Wheat.	Gram.
		Inches.	Lbs.	Lbs.	Lbs.
1870–71	Akola - -	29·07	660	—	—
„	Do. - -	—	538	—	—
„	Amraoti -	40·30	—	315 240 200 187	241 181 — —
1871–72	Akola - -	12·07	Crops failed.		
„	Amraoti -	19·22	525 230 300 202	— — — —	— — — 111
1872–73	Akola - -	45·80	151 120 507 1,317 136 564	166 — — — — —	— — — — — —
„	Amraoti -	37·61	404 253 536	280 — —	161 80 96
1873–74	Akola - -	31·01	341 412 —	300 287 243	— 219 313
		Average -	423	246	175

The soil of the farms was not very well suited for either wheat or gram crops, and the out-turn of these was probably smaller than is generally obtained from fields in the valley of Berar. My estimate of the average out-turn of grain crops based on the above figures is—

	Lbs.
Jowāri - - -	420
Wheat - - -	250
Other grains - -	250

A table (Statement I.) showing for each district the population, revenue, total area unculturable and culturable, is appended. It has not been possible to show separately in this the particulars of land which, although held on a cultivating lease, is kept for grazing purposes by the holders.

Statement II. gives the particulars per district which Statement B. in my first report gave for the whole province. I have, however, still adhered to my own estimate of the average out-turn per acre of each crop. The district figures on this head vary* so much that it is impossible to accept them.

My estimate of an average consumption of 5 maunds of grain per head per annum was based on local inquiries which seemed to show that adults eat about 20 ounces of grain per day.

According to the Census figures of 1867 there are in Berar:—

—	Male.	Female.	Total.
Adults - -	731,142	704,232	1,435,374
†Infants - -	422,055	374,136	796,191

† Under 13 years of age.

The proportion of total infants to total adults is 55·4, or, roughly, there are two adults to one infant. Calculating then that a man eats 20 ounces of grain per day, a woman about the same, and an infant say half* that quantity, my estimate is,—

For one man per annum - -	6 maunds.
For one woman per annum -	6 „
For one child per annum - -	3 „
Total - -	15 „

Average per head for three persons 5 maunds.

The crop statistics given at paragraph 3 of my report do not profess to include the areas of jagir and inam lands; but there is some reason to suppose that the practice in recording these statistics has varied in different districts. No specific information in regard to crop statistics of jagir and inam lands is, however, available.

I now append copies of† Statements III. and IV. of the Commissioner's Revenue Report for 1877–78, which contain later and fuller information than I was previously able to give:—

Statement III., showing the progress of cultivation during the year 1877–78, gives the total cultivated area of the province at 6,911,589, which is classified as follows:—

In reserved forests - -	10,259
In izara, or leased villages -	325,725
In jagir villages - - -	228,306
In palamput villages - -	5,264
In other villages - - -	6,342,035
Total - -	6,911,589

Statement IV., showing the area under each kind of crop in 1877–78, gives the total area under cultivation at 6,470,037 acres, and the difference between the two returns is thus accounted for by the Commissioner:—

"Between column 7 of Statement III. and the total cultivation shown by Statement IV. the following differences appear:—

—	Amraoti.	Akola.	Ellichpur.	Buldana.	Wun.	Basim.
Column 6, Statement A.	1,403,685	1,421,739	612,029	1,308,807	1,065,195	1,100,141
Statement IV. -	1,368,330	1,281,240	607,996	1,122,724	1,048,976	1,041,039
Differences -	35,355	140,499	4,033	186,083	16,220	59,102

"As the heading 'Cultivated' in Statement III. means 'occupied for cultivation' these differences should indicate the amount of land retained by occupiers for pasturage.

"The Deputy Commissioner, Akola, explains that of the difference in his district, 91,899 acres only represent occupied land under grass, the rest being due to the omission of jagir and inam lands in Statement B.

"The small amount of land retained for grass in Ellichpur is said to be attributable to the proximity of the Melghat jungles, to which cattle go for grazing.

"The Deputy Commissioner, Buldana, after stating that of the difference, 186,083 acres in his district, 121,957 acres consist of indifferent and grass land in the khalsa occupied area, goes on to explain that while Statement A. includes jagir and inam cultivation, Statement B. includes nothing but the area actually under the plough in khalsa land, and that the remaining 64,126 acres of difference may be put down to the cause.

"The largeness of the figures 121,957 which, after this explanation, represent land reserved for grass, suggests a doubt as to its accuracy, but it is impossible, without delaying this report, to inquire further now.

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* As an example of this I here give the district estimates of jowāri out-turn in 1877–78:

Estimated Out-turn per Acre.

	Lbs.
Amraoti - - - -	442
Akola - - - - -	92
Ellichpur - - - -	574
Buldana - - - -	362
Wun - - - - -	350
Basim - - - -	370

* A boy of 12 years will eat more than 3 maunds, but this is made up for by very young infants eating no grain.

† p. 82; but of Statement III. the total only has been given, and Statement IV. has been re-arranged and compressed.

"And the omission of jagir lands in Statement B. in Akola and Buldana raises the doubt whether they can have been included in this statement in other districts. If they have, the statistical returns of jagir villages are much more full than, judging from the facts stated in paragraph 5 of this chapter, I should have supposed them to be.

"I will not dwell further on figures, the accuracy of which might be in some districts doubtful, but will merely invite the attention of deputy commissioners to the doubt expressed above, and ask them next year to present figures which shall be thoroughly reliable regarding the occupied area left under grass. Information on this point is, I need scarcely say, of very great importance."

According the Commissioner's Revenue Report for 1876–77, the following was the extent of land under irrigation, and these are the figures which I adopted, viz.—

—	Rice Land Acres.	Irrigated Land Acres.	Total Acres.
Amraoti - - -	1,930	13,756	15,686
Akola - - -	508	20,226	20,734
Ellichpur - -	7,810	8,633	16,443
Buldana - -	2,470	25,164	27,634
Wun - - -	1,471	3,908	5,879
Basim - - -	7,256	8,554	15,810
	21,445	80,241	101,686

Irrigation fell off in 1877–78, and it is possible that Colonel Alexander referred to the returns for that year; but even if so his figures do not tally with the Commissioner's, which are as follows:—

Area under Irrigation in 1877–78.

—	Rice Land Acres.	Irrigated Land.	Total.
Amraoti - - -	1,051	13,431	14,482
Akola - - -	890	11,250	12,140
Ellichpur - -	9,030	4,128	13,158
Buldana - - -	6,655	9,507	16,162
Wun - - -	2,973	2,796	5,769
Basim - - - -	10,152	8,387	18,539
	30,751	49,499	80,250

Deputy commissioners have been asked to furnish information regarding the number of wells in their districts and I hope shortly to receive their reports on this point.

STATEMENT I.

Table showing the Population, Area, Land Revenue, &c., of each District in the Hyderabad Assigned Districts.

Districts.	Population.	* Area of Land in Acres.				Land Revenue.				Remarks.
		Cultivated.	Arable Uncultivated.	Unculturable, including Land taken up by Rivers, &c.	Total.	‡ Gross Amount Assessed.	Gross Demand of 1876–77.	Deduction on Account of Jaghirs, Village Expenses, &c.	Net Demand in 1876–77.	
						Rs.	Rs.	Rs.	Rs.	
Amraoti - - -	501,331	1,390,223	261,376	119,565	1,771,164	16,81,557	15,62,149	2,47,541	13,14,608	
Akola - - -	480,657	1,414,784	79,578	204,148	1,698,510	17,58,647	18,19,433	2,79,249	15,40,184	
Ellichpur - -	279,022	619,091	318,688	660,712	1,598,491	9,40,545	9,48,199	1,67,885	7,80,314	
Buldana - -	366,309	1,331,871	211,819	253,075	1,796,765	10,01,642	9,55,046	1,78,026	7,77,020	
Wun - - -	323,762	1,161,212	348,680	980,869	2,490,761	5,99,030	4,65,849	76,802	3,89,047	
Basim - - -	276,573	1,192,810	227,153	473,021	1,892,984	6,86,569	5,77,859	1,24,689	4,53,170	
Total - -	2,227,654*	7,109,991†	1,447,294	2,691,390	11,248,675	63,67,990	63,28,535	10,74,192	52,54,343	

* These are the Census figures of 1867, as modified by subsequent territorial changes.
† Including jaghirs.
‡ Jaghirs have not been assessed.

STATEMENT II.

General Statement showing the Average Produce and estimated Local Consumption, with amount available for Export.

District.	Average Cultivated with Edible Grains in Acres.			Total Average Cultivated with Edible Grains.	Average Produce per Acre in Lbs.			Produce of each Grain in Maunds.			Local Consumption in Maunds.			Available for Export.		Remarks.
	Jowari.	Wheat.	Other Grains.		Jowari.	Wheat.	Other Grains.	Jowari.	Wheat.	Other Grains.	Food at 5 Maunds per Head per Annum.	Seed at 12 Maunds per Acre.	Total.	Maunds.	Tons.	
Amraoti - -	490,375	115,811	35,464	641,650	420	250	250	2,674,467	362,109	110,824	2,506,655	96,247	2,602,902	544,498	19,446	
Akola - -	471,359	65,850	74,469	611,678	420	250	250	2,454,633	207,687	232,715	2,403,285	91,752	2,495,037	399,998	14,286	
Ellichpur -	199,370	43,649	47,454	290,473	420	250	250	1,016,691	136,403	148,294	1,395,110	43,571	1,438,681	—	—	
Buldana -	348,384	137,221	143,740	629,345	420	250	250	1,804,561	426,712	449,168	1,831,545	94,402	1,925,947	754,491	26,946	
Wun - -	439,886	32,708	36,886	509,480	420	250	250	2,308,410	102,211	115,185	1,618,810	76,422	1,695,232	830,574	29,663	
Basim - -	296,182	103,099	124,308	523,589	420	250	250	1,530,401	322,184	388,567	1,382,865	78,538	1,461,403	779,749	27,848	
Total in province	2,245,556	498,338	462,321	3,206,215	420	250	250	11,789,163	1,557,306	1,444,753	11,138,270	480,932	11,619,202	3,172,020	113,286	

App. I. Qn. 3.

Berar.

Mr. Dunlop.

STATEMENT III.

STATEMENT showing the PROGRESS of CULTIVATION during the year 1877–78.

Classification of Area.	Area.	Un-culturable Area.	Balance or Culturable Area.	Details of Column 5. Uncultivated. 1876–77.		Cultivated. 1876–77.	1877–78.	Per-centage of column 6 to column 4. 1876–77.	1877–78.
					1877–78.				
1.	2.	3.	4.	5.		6.		7.	
Reserved Forests -	730,101	541,453	188,644	177,366	178,383	11,438	10,259	6·0	5·4
Integral waste villages	399,698	255,774	143,920	144,528	143,920	95	...	...	...
Izara villages - -	887,721	400,077	487,649	3,788	161,922	467,108	325,725	95·8	66·8
Jagir do. -	380,546	115,255	265,288	36,322	36,977	236,976	228,306	89·3	86·6
Other do. -	8,852,596	1,482,194	7,370,397	1,090,471	1,028,361	6,180,911	6,342,035	83·8	86·0
Palamput do. -	7,444	2,180	5,264	...	...	5,264	5,264	100·0	100·0
Grand Total -	11,258,126	2,796,933	8,461,164	1,452,475	1,549,563	6,901,702	6,911,589	81·5	81·7

STATEMENT IV.

Showing the ACREAGE under each kind of Crop in 1877–78.

Grain.	Acreage.	Per-centage.
KHÀRIF CROP.		
Rice - - -	30,751	0·48
Joár - - - -	2,598,041	40·15
Bajra - -	157,571	2·44
Tur - - -	90,269	1·40
Urd - -	18,099	0·28
Moong - - -	4,781	0·07
Cotton - - -	2,078,269	32·12
Til - - -	154,553	2·39
Tobacco - - - -	17,060	0·26
Kurhal - - -	37,416	0·58
Indigo - - - -	188	—
Bhadli - - -	21,970	0·34
Mudle - - -	6,839	0·09
Ralla - - -	357	0·01
Kulthi - - -	108	—
Hulgay - -	1,025	0·02
Rajgeera - - -	34	—
Kutki - - - -	61,742	0·95
Chillies - - -	19,483	0·30
Savree - - -	2,208	0·03
Ajwan - - -	40	—
Castor Seed - - -	10,490	0·16
Kodo - - -	1,029	0·02
Ganja - - -	74	—
Walkat - - -	49	—
Ground Nut - -	2,146	0·03
Maize - - - -	1,639	0·03
Turmeric - - -	2,389	0·04
Brinjals - - - -	3,401	0·05
Hemp - -	13,940	0·22
RABI CROP.		
Wheat - -	524,454	8·11
Gram - - - -	162,184	2·51
RABI CROP—*cont.*		
Lac - - -	65,155	1·01
Linseed - - - -	216,891	3·35
Kwide - - -	58,192	0·90
Wattana - - -	21,192	0·33
Masur - - -	28,941	0·45
Gudmul - - -	51	—
Til - - -	825	0·01
Coriander - - -	1,506	0·02
Opium - - -	1,887	0·03
Joár - - - -	6,768	0·10
GARDEN PRODUCE.		
Lemons - - -	103	—
Guavas - - -	724	0·01
Plantains - - -	1,990	0·03
Yams - - - -	211	—
Flowers - - -	23	—
Vegetables - - -	9,314	0·14
Grapes - - -	1	—
Garden produce - -	11,576	0·18
MISCELLANEOUS.		
Beetel leaves - -	1,622	0·03
Sweet potatoes - -	392	0·01
Ginger - - - -	9	—
Cummin - - -	10	—
Sugar-cane - - -	4,772	0·07
Jira - - -	47	—
Alli - - - -	15,942	0·25
Total cultivation -	6,470,186	100

Bombay.

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BOMBAY.

The following statistics will be found in a tabulated form in the Appendix of the Bombay Administration Reports. They are compiled from the returns kept in the villages and talukas. The return of culturable land is accurate and the others approximate.

1. The extent of each description, *i.e.*, irrigated dry crop, &c. of assessed culturable land in the Government villages of each district, with the cultivated area of the year, and that of the previous year for comparison.

2. The area on which each of the products of each district was cultivated in the year of report.

3. Extent of land under cotton, and quantity of clean cotton realised.

4. Prices of the products at each place.

The following statement, compiled from the Administration and Jumabandy Reports, shows the culturable area of Government land (figures are not available for alienated land), the area in occupation, and the area cropped in a good average year, 1873–74:

GOVERNMENT LAND CULTIVATION STATEMENT, 1873–74.

No. 1.	District. 2.	Culturable Government Acres. 3.	Occupied Acres. 4.	Deduct Fallow Acres and Grass Land. 5.	Leaves Cropped Acres. 6.	Add twice Cropped Acres. 7.	Total Cultivation. 8.
1	Ahmedabad - - -	13,24,083	9,51,738	34,260	9,17,478	9,929	9,27,407
2	Kaira - - -	7,60,200	5,56,737	55,042	5,01,695	18,735	5,20,430
3	Panch Máháls* - -						
4	Broach - - -	4,77,238	4,54,045	63,202	3,90,843	271	3,91,114
5	Surat - - -	7,51,899	6,37,929	2,12,518	4,25,411	37,723	4,63,134
6	Thána - - -	10,35,021	9,77,227	4,52,291	5,24,936	5,312	5,30,248
7	Kolába - - -	4,74,495	4,72,674	2,03,176	2,69,498	7,274	2,76,772
8	Násik - - -	20,23,744	15,97,752	2,07,770	13,89,982	6,635	13,96,617
9	Khándesh - - -	34,40,815	23,63,093	2,28,838	21,34,255	1,258	21,35,513
10	Ahmednagar - - -	25,56,826	24,48,750	2,74,656	21,74,094	—	21,74,094
11	Poona - - -	19,40,165	19,01,205	1,88,721	17,12,484	14,342	17,26,826
12	Sholápur - - -	19,52,916	19,41,633	1,69,370	17,72,263	—	17,72,263
13	Sátára - - -	16,79,826	16,58,080	2,45,772	14,12,308	41,939	14,54,247
14	Kaládgi - - -	20,74,227	20,12,036	51,151	19,60,885	752	19,61,637
15	Belgaum - - -	11,90,123	11,13,083	1,30,810	9,82,273	3,602	9,85,875
16	Dhárwár - - -	16,14,766	15,23,430	1,46,486	13,76,944	1,262	13,78,206
17	Ratnágiri - - -	9,23,678	9,90,185	3,361	9,86,824	14,175	10,00,999
18	Kanara - - -	—	—	—	—	—	—
	Total - -	2,42,20,022	2,45,99,597	26,67,424	1,89,32,173	1,63,209	1,90,95,382

* Separate figures for the Panch Máháls are not available.

Returns for Kanara are not prepared. As the survey has only been partially introduced, information for the whole district is not available.

Of the 1,90,95,382 acres shown as cropped, the principal food grains occupied the following areas :—

	Acres.
Jowári - - -	63,37,549
Bajra - - -	38,66,916
Wheat - - -	12,23,736
Rice - - -	11,32,816
	1,25,61,017

Cotton occupied 17,37,529 acres.

The following statement, compiled from the Revenue Commissioner's Returns, shows the comparative areas under the principal food grains as compared with cotton, from 1860 to 1874 :—

Year.	Jowári.	Bájri.	Wheat.	Rice.	Principal Food Grains.	Cotton.	
						Cotton Department's Figures, including Cultivation in Native States and Alienated Lands.	Revenue Commissioner's Figures, showing Cultivation in Government Lands only.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1860–61 - -	49,96,062	32,44,825	10,67,216	6,20,804	99,28,907	10,22,244	10,02,196
1861–62 - -	50,33,113	32,87,121	10,60,968	6,52,573	1,00,33,775	11,43,096	11,40,434
1862–63 - -	55,45,852	25,11,295	14,26,566	7,05,611	1,01,89,324	12,96,773	13,09,484
1863–64 - -	52,39,527	32,08,427	13,38,934	7,28,587	1,05,15,475	17,82,174	15,17,321
1864–65 - -	54,71,488	33,80,708	11,71,260	7,38,753	1,07,62,209	22,34,300	13,73,447
1865–66 - -	59,70,598	34,58,587	12,07,382	7,58,859	1,13,95,426	16,48,717	11,86,097
1866–67 - -	56,55,887	35,58,036	12,93,385	12,28,518	1,17,35,826	19,56,568	14,35,183
1867–68 - -	57,31,923	37,39,050	13,30,896	11,83,687	1,19,85,556	19,61,078	14,36,735
1868–69 - -	59,19,565	39,61,581	11,36,319	10,78,647	1,20,96,112	19,47,511	14,36,613
1869–70 - -	51,38,693	46,93,079	9,66,236	11,04,490	1,19,02,498	27,80,744	19,78,711
1870–71 - -	58,50,389	38,29,953	11,91,474	11,95,477	1,20,67,293	25,21,357	18,42,731
1871–72 - -	71,66,951	29,06,493	10,24,969	10,95,510	1,21,93,923	19,82,493	14,46,959
1872–73 - -	59,44,992	44,65,253	10,47,266	11,48,138	1,26,05,649	21,18,403	15,87,731
1873–74 - -	63,37,549	38,66,916	12,23,736	11,32,816	1,25,61,017	22,66,382	17,37,529
Total -	8,00,02,589	5,01,11,324	1,64,86,607	1,33,72,470	15,99,72,990	2,66,64,840	2,06,31,171
Average -	57,14,470	35,79,380	11,77,615	9,55,176	1,14,26,642	19,04,417	14,73,655

Ap. I. Qn. 3.

Bombay.

Mr. Peile.

The following facts are furnished by the collectors as to the production per acre and the consumption and export of grain:—

District.	Average Amount of Food Grains produced per Acre.	Disposal of Crop, Amount of Local Consumption, Surplus Exported, or Deficiency Imported.
Kaira - -	Bengal maunds. Seers. Wheat - 4 24 Rice - 8 58 Bajri - 5 6 Grain - 3 72	Bajra is largely produced. Kaira exports grain and tobacco. The people eat bajra, rice, and the coarser millets. The export of grain by railway in 1876 was 21,344 tons.
Surat - -	- - -	Rice and jowári are the principal products, covering about 21 and 18 per cent. respectively of the cultivated area. Cotton covers about 15 per cent. Surat exports surplus grain.
Broach - -	- - -	The principal food products are jowári, wheat, bajra, and pulses. Cotton occupies 44·71 per cent. of the area. Both cotton and grain are exported.
Thana - -	Bengal maunds. Seers. Rice - 12 0	Rice is the staple product. It is stated that about 48 lakhs of maunds are consumed and 12 lakhs exported.
Khandesh -	Wheat - 2 79 Rice - 2 36 Jowári - 2 28 Bajri - 2 16	The principal food products are bajra, jowári, and wheat. Khandesh exports a surplus.
Nassick -	- - -	Bajra and wheat are the principal products. After all the wants of the people have been supplied, a considerable quantity of wheat and bajra is available for export in a good season.
Poona - -	Bengal maunds. Seers. Wheat - 4 0 Bajra - 4 0 Jowári - 4 0 Rice - 10 0	Bajra and jowári are the principal products. Surplus grain is exported from Poona.
Sholapur -	- - -	Sholapur exports grain in average years.
Kaladgi -	Jowári - 292½ lbs. Bajra - 218⅓ „ Wheat - 286¼ „	The production is much greater than the consumption, and a large residue remains for export or storage. In ordinary years none of the staple grains (jowári, bajra, wheat) is ever imported, though rice is for the higher classes.
Satara - -	Jowári - 2 maunds Bajra - 1 m. 10 lbs.	The whole food grain produced is consumed in Satara, and rice is imported from the Concan.
Dharwar -	- - -	—
Colaba - -	Rice - 20 maunds Nagli - 8 „	There is a yearly surplus of produce after supplying the consumption of the people.
Ratnagiri -	- - -	The hill crops (warkas) are nagli, wari, and harik, which the people eat. Ratnagiri does not grow enough food for its population, but depends on imports from Bombay by sea and from the Deccan by land. In 1862, a year of scarcity in the Deccan, the people of Ratnagiri were reduced to straits by the exportation of their stocks to the Deccan before the monsoon.
Canara -	- - -	The chief product is rice, the surplus of which is exported.

SINDH.

Sindh.

Col. Haig.

5. The average area under cultivation yearly in each district is as under:—

—	Food Crops.	Other Products.	Total Acres.
	Acres.	Acres.	
Frontier Districts - -	134,199	49,387	183,586
Shikarpur - - -	644,072	119,181	763,255
Hyderabad - - -	408,936	125,594	534,530
Kurrachee - - -	276,293	79,824	356,117
Thar and Parkar - -	240,854	62,587	303,441
Total - -	1,704,355	436,574	2,140,928

6. The various food crops are grown in the province to the following extent, and with the following average yield:—

—	Acres.	Average Yield per Acre.	Total Produce.
		Maunds.	Maunds.
1. Joár - - -	450,829	9	40,57,461
2. Bajra - - -	405,626	8	32,45,008
3. Wheat - - -	313,977	10	31,39,770
4. Gram - - -	20,698	6	1,24,188
5. Rice (dressed) - -	486,275	8	38,90,200
6. Barley - - -	17,678	9	1,59,102
7. Mung and Urad - -	9,272	6	55,632
Total - - -	1,704,355	—	1,46,71,361

7. The areas given in the two preceding paragraphs are the average of seven years ending 1876–77, and are taken from the annual Revenue Reports of the Commissioner in Sind. I am inclined to think, however, that they overstate actual cultivation. The yield per acre is what is generally allowed to be a fair average for Sind. If we take the annual consumption of food grains at 6 maunds per head, the requirements of the population (2,192,435) are 1,31,54,610 maunds, which would leave, supposing the estimate of produce under paragraph 6 to be near the truth, 15,16,751 maunds available for export. As a fact every taluka in the province exports produce, and the average annual export from the province of grain and pulse, considered to be the produce of Sind, has for the last five years been 11,57,807 maunds, which leaves 3,58,944 maunds as a reserve.

MADRAS.

Madras.

e Board of Revenue.

Statistics of acreage under the several kinds of crops are available only for lands held under ryotwari and inam tenures in this presidency. No attempt has been made to collect statistics as regards the acreage of crops in zemindari lands, as it is impossible to procure reliable statistical information in such tracts in the absence of any well constituted and trustworthy agency suited to the purpose.

The following statement shows the average acreage under the principal kinds of crops in ryotwari and inam lands in each district:—

STATEMENT showing the AVERAGE ACREAGE under Crops during the four Years ending Fasli 1285 (1875-76) in the Madras Presidency (Inam and Ryotwari Lands).

Districts.	FOOD GRAINS OR CORN CROPS.												Green and Garden Crops.	Seeds.	Topes and Orchards.	SPECIAL CROPS.				Total Area under all Crops.
	Rice.			Cholum.	Ragi.	Varagu or Aricalu.	Cambu.	Koralu or Tenay.	Millet or Samai.	Pulses.	Miscellaneous Crops.	Total.				Cotton.	Indigo.	Other Crops.	Total.	
	One Crop Irrigated.	Second Crop Irrigated.	Unirrigated.																	
Ganjam	Acres. 199,000	Acres. 16,000	Acres. 44,000	Acres. 1,000	Acres. 73,000	Acres. —	Acres. 6,000	Acres. —	Acres. 1,000	Acres. 32,000	Acres. 3,000	Acres. 375,000	Acres. 10,000	Acres. 24,000	Acres. 10,000	Acres. 5,000	Acres. —	Acres. —	Acres. 5,000	Acres. 424,000
Vizagapatam	37,000	—	2,000	2,000	10,000	2,000	25,000	1,000	3,000	5,000	2,000	89,000	3,000	19,000	—	4,000	—	—	4,000	115,000
Godavari	425,000	2,000	99,000	75,000	18,000	3,000	9,000	9,000	9,000	92,000	22,000	763,000	27,000	114,000	21,000	21,000	3,000	20,000	44,000	969,000
Kistna	213,000	1,000	125,000	518,000	20,000	133,000	149,000	50,000	—	281,000	169,000	1,659,000	48,000	122,000	10,000	240,000	38,000	2,000	280,000	2,119,000
Nellore	214,000	6,000	8,000	357,000	37,000	80,000	62,000	10,000	—	63,000	104,000	941,000	20,000	47,000	—	16,000	51,000	—	67,000	1,075,000
Cuddapah	127,000	27,000	4,000	467,000	130,000	38,000	370,000	107,000	31,000	185,000	20,000	1,506,000	17,000	44,000	21,000	90,000	56,000	—	146,000	1,734,000
Bellary	107,000	36,000	5,000	1,157,000	110,000	13,000	223,000	—	680,000	498,000	59,000	2,888,000	34,000	176,000	47,000	380,000	6,000	1,000	387,000	3,532,000
Kurnool	48,000	9,000	9,000	862,000	21,000	139,000	94,000	330,000	—	151,000	51,000	1,714,000	30,000	79,000	—	230,000	42,000	—	272,000	2,095,000
Madras	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chingleput	320,000	49,000	45,000	8,000	39,000	49,000	15,000	—	—	4,000	2,000	531,000	9,000	16,000	28,000	—	12,000	—	12,000	596,000
North Arcot	197,000	80,000	6,000	23,000	96,000	65,000	97,000	1,000	7,000	45,000	3,000	620,000	19,000	67,000	15,000	—	18,000	—	18,000	739,000
South Arcot	310,000	51,000	46,000	23,000	155,000	195,000	222,000	—	6,000	24,000	3,000	1,044,000	20,000	85,000	26,000	26,000	81,000	—	107,000	1,282,000
Tanjore	877,000	45,000	59,000	14,000	36,000	121,000	47,000	—	—	28,000	10,000	1,237,000	48,000	16,000	—	4,000	1,000	—	5,000	1,306,000
Trichinopoly	123,000	54,000	16,000	156,000	109,000	160,000	164,000	1,000	31,000	74,000	—	893,000	23,000	41,000	8,000	37,000	1,000	—	38,000	1,003,000
Madura	134,000	30,000	3,000	196,000	108,000	89,000	115,000	9,000	104,000	66,000	17,000	871,000	17,000	38,000	5,000	50,000	—	1,000	51,000	982,000
Tinnevelly	192,000	28,000	—	81,000	56,000	62,000	232,000	1,000	159,000	95,000	6,000	912,000	35,000	55,000	19,000	178,000	—	3,000	181,000	1,202,000
Coimbatore	71,000	19,000	1,000	653,000	229,000	8,000	774,000	40,000	99,000	232,000	9,000	2,135,000	57,000	83,000	5,000	215,000	—	2,000	217,000	2,497,000
Nilgiris	—	—	—	—	4,000	—	—	13,000	6,000	—	12,000	35,000	2,000	1,000	—	—	—	13,000	13,000	51,000
Salem	87,000	19 000	15,000	75,000	373,000	92,000	346,000	15,000	67,000	242,000	12,000	1,343,000	30,000	111,000	7,000	11,000	2,000	1,000	14,000	1,505,000
South Canara	200,000	176,000	110,000	—	4,000	—	—	—	—	43,000	1,000	534,000	8,000	5,000	33,000	—	—	1,000	1,000	581,000
Malabar	392,000	110,000	81,000	—	3,000	—	—	—	—	—	5,000	591,000	—	26,000	255,000	—	—	32,000	32,000	904,000
Total	4,287,000	758,000	678,000	4,668,000	1,631,000	1,249,000	2,950,000	587,000	1,203,000	2,160,000	510,000	20,681,000	457,000	1,169,000	510,000	1,507,000	311,000	76,000	1,894,000	24,711,000

CHAP. I. QN. 3.

MADRAS.

The Board of Revenue.

The average has been taken on the area under crop during the four years ending 1875–76, which embraces two good and two indifferent agricultural seasons.

The area under crop in ryotwari and inam lands for the whole presidency amounts to nearly 24¾ million acres, inclusive of second crop cultivation to the extent of a little over 2¼ million acres. Of this area food grains occupy upwards of 20½ million acres, green and garden crops nearly half a million, oil seeds, &c. upwards of a million, topes and orchards half a million, cotton a million and a half, and indigo and other special crops a little less than half a million.

For zamindari lands, as already observed, no cultivation accounts are received excepting from a few districts in which zamindari cultivation is comparatively unimportant, and recourse must therefore be had to a rough estimate.

In Statement No. IV., prepared in connection with the Census of 1871, and printed in the Board's Proceedings, forming an annexure to the reply to question 10, the zamindari cultivated acreage is shown as given by the returns furnished by the zamindars, but the statement is not complete, as the necessary particulars for the large zamindaris of Shivaganga and Ramnad in the Madura District, Venkatagiri Zemindari and Pamur taluk of Kalahasti Zemindari in Nellore, and the Jeypore zemindari in Vizagapatam are omitted. The entries in the statement are not perfectly trustworthy, but the Board believe they are sufficiently correct to form the basis of a rough calculation, and no better data are available.

The following statement of zamindari cultivation has been framed on the basis of the above statement. For districts in which the zamindari cultivation has been reported by collectors, their figures have been adopted, and for the others it has been considered that for the purpose of a rough calculation the proportion of cultivated to total area may be assumed to be the same as the corresponding proportion for the remainder of the district in which they are situated :—

Cultivation in Zamindari Tracts.

	Acres.
Ganjam, exclusive of the Maliahs - - -	733,000
Vizagapatam, exclusive of Jeypore Zemindari -	1,181,000
Godavari - - -	541,000
Kistna - - - -	534,000
Nellore - - - -	852,000
Cuddapah - - - -	—
Bellary (Sundoor) - -	44,000
Kurnool (Banganapally) -	58,000
Madras - - - -	—
Chingleput - - -	77,000
North Arcot - - -	393,000
South Arcot - - -	9,000
Tanjore - - - -	72,000
Trichinopoly - -	159,000
Madura - - - -	964,000
Tinnevelly - - -	625,000
Coimbatore - - - -	61,000
Nilgiris - - - -	—
Salem - - - - -	511,000
South Canara - -	—
Malabar - - - -	3,000
Total -	6,817,000

The total cultivated area of the presidency under crops of all kinds may thus be taken at 31½ million acres.

With regard to the distribution of the different crops in the zamindari cultivated area there is as a rule absolutely no information, but there is no reason to suppose that it is very different from that found to exist as regards Government and inam lands, distribution of crops being affected more by the climate and rainfall than by the conditions of tenure under which lands are held. The following table of the distribution of food crops in zamindari lands in each district has been prepared on the supposition that the proportion of the acreage of each kind of crop is the same for zamindari as for ryotwari and inam lands which, being situated in the same district, are influenced by the same climate and rainfall and as a consequence by the same methods of cultivation :—

Districts.	FOOD GRAINS OR CORN CROPS (ZEMINDARI LANDS).											
	Rice.			Cholum.	Ragi.	Varagu or Aricalu.	Cumboo.	Koralu or Tenay.	Samai.	Pulses.	Miscellaneous.	Total.
	One Crop Irrigated.	Second Crop Irrigated.	Un-irrigated.									
Ganjam - -	344,000	28,000	76,000	2,000	126,000	—	10,000	—	2,000	55,000	5,000	648,000
Vizagapatam -	343,000	—	18,000	19,000	93,000	19,000	232,000	9,000	28,000	46,000	18,000	825,000
Godavari - -	237,000	1,000	55,000	42,000	10,000	2,000	5,000	5,000	5,000	51,000	13,000	426,000
Kistna - -	54,000	—	31,000	131,000	5,000	33,000	38,000	13,000	—	71,000	42,000	418,000
Nellore - -	170,000	5,000	6,000	283,000	29,000	63,000	49,000	8,000	—	50,000	82,000	745,000
Cuddapah - -	—	—	—	—	—	—	—	—	—	—	—	—
Bellary - -	1,000	—	—	15,000	1,000	—	3,000	—	9,000	6,000	1,000	36,000
Kurnool - -	1,000	—	—	24,000	1,000	4,000	3,000	9,000	—	4,000	1,000	47,000
Madras - -	—	—	—	—	—	—	—	—	—	—	—	—
Chingleput -	42,000	6,000	6,000	1,000	5,000	6,000	2,000	—	—	1,000	—	69,000
North Arcot -	103,000	42,000	3,000	12,000	51,000	35,000	52,000	—	4,000	24,000	2,000	330,000
South Arcot -	2,000	—	—	—	1,000	2,000	2,000	—	—	—	—	7,000
Tanjore - -	18,000	—	7,000	1,000	2,000	24,000	10,000	—	—	3,000	1,000	66,000
Trichinopoly -	11,000	4,000	2,000	20,000	14,000	21,000	21,000	—	4,000	10,000	—	108,000
Madura - -	131,000	29,000	3,000	192,000	106,000	87,000	113,000	9,000	102,000	65,000	17,000	854,000
Tinnevelly - -	24,000	2,000	—	68,000	27,000	12,000	233,000	1,000	65,000	24,000	11,000	467,000
Coimbatore -	—	—	—	27,000	3,000	—	18,000	1,000	5,000	4,000	—	58,000
Nilgiris - -	—	—	—	—	—	—	—	—	—	—	—	—
Salem - -	30,000	7,000	5,000	25,000	127,000	31,000	118,000	5,000	23,000	82,000	4,000	457,000
South Canara -	—	—	—	—	—	—	—	—	—	—	—	—
Malabar - -	2,000	—	—	—	—	—	—	—	—	—	—	2,000
Total -	1,515,000	125,000	212,000	862,000	601,000	339,000	909,000	63,000	247,000	496,000	197,000	5,563,000

It is almost needless to remark that no very great accuracy is claimed for the above estimates.

The total area under food grains in the presidency in all kinds of lands may then be estimated as follows :—

Districts.	Food or Grain Crops, Ryotwari, Inam, and Zemindari Lands.											
	Rice.			Cholum.	Ragi.	Varagu or Aricalu.	Cumboo.	Koralu or Tenay.	Samai.	Pulses.	Miscellaneous.	Total.
	First Crop Irrigated.	Second Crop Irrigated.	Un-irrigated.									
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Ganjam - -	543,000	44,000	120,000	3,000	199,000	—	16,000	—	3,000	87,000	8,000	1,023,000
Vizagapatam -	380,000	—	20,000	21,000	103,000	21,000	257,000	10,000	31,000	51,000	20,000	914,000
Godavari - -	662,000	3,000	154,000	117,000	28,000	5,000	14,000	14,000	14,000	143,000	85,000	1,189,000
Kistna - -	267,000	1,000	156,000	649,000	25,000	166,000	187,000	63,000	—	352,000	211,000	2,077,000
Nellore - -	384,000	11,000	14,000	640,000	66,000	143,000	111,000	18,000	—	113,000	186,000	1,686,000
Cuddapah - -	127,000	27,000	4,000	467,000	130,000	38,000	370,000	107,000	31,000	185,000	20,000	1,506,000
Bellary - -	108,000	36,000	5,000	1,172,000	111,000	13,000	226,000	—	689,000	504,000	60,000	2,924,000
Kurnool - -	49,000	9,000	9,000	886,000	22,000	143,000	97,000	339,000	—	155,000	52,000	1,761,000
Madras - -	—	—	—	—	—	—	—	—	—	—	—	—
Chingleput -	362,000	55,000	51,000	9,000	44,000	55,000	17,000	—	—	5,000	2,000	600,000
North Arcot - -	302,000	122,000	9,000	35,000	147,000	100,000	149,000	1,000	11,000	69,000	5,000	950,000
South Arcot -	321,000	51,000	46,000	23,000	156,000	197,000	224,000	—	6,000	24,000	3,000	1,051,000
Tanjore - -	895,000	45,000	66,000	15,000	38,000	145,000	57,000	—	—	31,000	11,000	1,303,000
Trichinopoly -	139,000	59,000	18,000	176,000	123,000	181,000	185,000	1,000	35,000	84,000	—	1,001,000
Madura - -	265,000	59,000	6,000	388,000	214,000	176,000	228,000	18,000	206,000	131,000	34,000	1,725,000
Tinnevelly - -	216,000	30,000	—	149,000	83,000	74,000	465,000	2,000	224,000	119,000	17,000	1,379,000
Coimbatore - -	71,000	19,000	1,000	680,000	232,000	8,000	792,000	41,000	104,000	236,000	9,000	2,193,000
Nilgiris - -	—	—	—	—	4,000	—	—	13,000	6,000	—	12,000	35,000
Salem - -	117,000	26,000	20,000	100,000	500,000	123,000	464,000	20,000	90,000	324,000	16,000	1,800,000
South Canara -	200,000	176,000	110,000	—	4,000	—	—	—	—	43,000	1,000	534,000
Malabar - -	394,000	110,000	81,000	—	3,000	—	—	—	—	—	5,000	593,000
Total -	5,802,000	883,000	890,000	5,530,000	2,232,000	1,588,000	3,859,000	647,000	1,450,000	2,656,000	707,000	26,244,000

The Board have experienced very great difficulty in endeavouring to arrive at an estimate of the ordinary average yield per acre of the different kinds of crops. With such an almost infinite variety of soils distributed in different proportions throughout the different districts, the assumption of any general average for the whole presidency may lead to very fallacious results unless the rate assumed is based on an extensive series of observations of each class of land in each district for a large number of seasons. For the districts recently settled by the Revenue Settlement Department, however, an attempt was made to ascertain the yield of different classes of land by actual experiments. In some cases the experiments extended over a large number of years, and the results were accepted in making the settlement as affording a sufficiently true index to the average yield. In other cases where the experiments had not been spread over a sufficiently long period for the elimination of variations arising from ordinary fluctuations of season, a rate was assumed by the settling officers on a joint consideration of the experimental results and the known circumstances of the tract dealt with. For districts not settled there is no information, and the only guide is the estimates furnished by the local officers on general local inquiry. The following statement shows the average yield as estimated by the Settlement Department for the settled districts, and by the collectors for the others :—

Districts.	Food Grains.										Remarks.
	Paddy.		Cholum.	Ragi.	Varagu or Aricalu.	Cumboo.	Koralu or Tenay.	Samai.	Pulses.	Miscellaneous.	
	One Crop Irrigated.	Unirrigated.									
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	
Ganjam - -	1,344	—	—	798	—	—	—	—	—	—	
Godavari - -	1,938	1,525	1,421	1,743	—	1,104	—	—	—	453*	* Horse gram.
Kistna - -	2,015	959	992	—	960	562	—	—	—	—	
Nellore - - -	1,615	—	459	—	736	429	—	—	—	—	
Kurnool - -	2,100	—	551	—	—	—	381	—	—	—	
Cuddapah (seven taluks).	2,197	—	551	657	—	341	423	300	—	300†	† Ariga.
Chingleput - -	1,219	—	—	474	819	—	—	—	—	—	
South Arcot (Chilambaram).	1,809	—	1,013	922	1,485	921	—	—	—	—	
Salem - - -	1,833	—	939	945	—	802	—	—	—	—	
Coimbatore (five taluks).	1,750	—	521	496	—	479	—	—	—	—	
Trichinopoly -	1,678	—	690	834	1,208	638	—	—	—	—	
Tinnevelly - -	1,784	—	—	—	—	—	—	—	—	—	
Vizagapatam -	2,400	—	—	900	—	900	—	—	—	600‡	‡ Horse gram.
Bellary - -	(rice) 900	—	320	500	—	230	—	—	—	165	
North Arcot - -	2,500	—	600	800	—	700	—	—	—	650	
Tanjore - -	1,440	667	630	504	672	504	—	—	—	—	
Madura—											
Collector - -	(rice) 1,930	—	1,170	1,170	—	1,170	—	—	—	—	
Sub-Collector -	820	—	574	763	486	328	389	358	500	—	
Nilgiris - - -	—	—	357	—	—	—	604	650	—	1,100§	§ Gangee and wheat.
South Canara -	(rice) 1,008	(rice) 472	—	—	—	—	—	—	—	—	
Malabar - -	1,060	—	—	—	—	—	—	—	—	—	

The rates given as averages by the Settlement Department have been arrived at on a careful calculation of the proportions of the land of different classes of soils under cultivation in each district. Taking all the tracts settled by the Revenue Settlement Department as a whole, and taking into account also the acreage of each kind of crop, the average yield per acre comes out as follows :—

	Lbs.
Paddy - - -	1,621
Cholum - -	666
Ragi - - - -	770
Korra - -	400
Cumbu - - - -	630
Varagu - -	950
Ariga - - -	500
Unirrigated paddy -	1,330
Horse gram - -	600

The portion of the presidency in which settlement operations have been completed or are in progress comprise a sufficiently large extent of country to represent fairly the varying conditions of the different parts of the presidency with the exception of the two West Coast Districts.

Mr. Benson, the acting superintendent of Government Farms, in a memorandum on this question submitted to Mr. Ballard, estimates the average out-turn at—

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	Per acre.
	Lbs.
Paddy - - - -	1,008
Unirrigated—	
Cereals - - -	616
Pulses - - - -	448

Although this estimate is based on a consideration of Settlement Reports and other observations in connection with the district of Chingleput, in which agricultural conditions are in many ways singularly unfavourable, Mr. Robertson, the superintendent of the Government Farms, considers even Mr. Benson's estimates to be too high. He bases this opinion on a statement of produce furnished by the Collector of Coimbatore for Fasli 1284, in which the rates of out-turn are all lower than those given by Mr. Benson, except as regards paddy, and he is of opinion that the Coimbatore District may be taken as fairly representing the average agricultural conditions of the entire presidency. In support of this statement he gives the following table :—

—	Coimbatore.	Whole Presidency.
Population per square mile - -	237·3	226·2
Houses - - - - - -	48·6	45·0
Persons per house - - - - -	4·88	5·02
Incidence of land revenue per head of the population.	Rs. 1 6 8	Rs. 1 6 8
Assessment per acre—		
Wet - - - -	„ 7 5 0	„ 4 9 0
Dry - - - - - -	„ 0 14 3	„ 1 1 0
Per-centage to total cultivation of area under—		
Cereals - - - - -	77·89	76·28
Pulses - - - -	8·90	9·05
Oil seeds - - - - -	3·44	5·54
Indigo - - - - - -	—	1·10
Cotton, other special crops - -	8·81	6·14
Garden crops - - - - -	1·96	1·89

The statement of the out-turn of produce furnished by the Collector of Coimbatore is evidently based on the rough estimates of tahsildars, and in itself is not entitled to any special weight. Independently of this, the Board doubt whether Coimbatore can be regarded as fairly representing, for the purpose in question, the average agricultural condition of the presidency. The two most important considerations which affect the out-turn of produce are the rainfall and the nature of the soil, and in both these respects Coimbatore is below the average of the presidency. Mr. Wedderburn, the late collector of Coimbatore, who was intimately acquainted with the district, writes: "I have not seen any exceptional soils in this district, though I have been over every taluk of it, and my impression of it after seven years, is that it is singularly unfavoured; rainfall scanty and ill-distributed; raging winds blow for half the year; a full crop dependent on rainfall is, I am convinced, the exception, and half or quarter the average."

Referring to Mr. Robertson's table, it seems to the Board that the proportions of area under cereals, &c. do not prove anything with respect to the out-turn, and the density of population is influenced by a variety of causes. The old assessments were not fixed throughout the presidency on a uniform principle, but even supposing them to be a tolerably good guide to the comparative yield of lands in different districts, the fact that nearly the whole of the cultivation (96 per cent.) is unirrigated in the Coimbatore District, and that the average unirrigated rate for Coimbatore is less than the average rate for the whole presidency by nearly 18 per cent. would seem to point to a conclusion somewhat different from that drawn by Mr. Robertson, who, however, has not failed to point to the fact of the irrigated assessment being above the average as a reason for considering the yield of paddy to be exceptionally high. It is also noteworthy that the proportion of poor ryots in the Coimbatore District is considerably above the average of the presidency, the number of registered puttadars paying less than 10 rupees assessment being 71 per cent. in that district against 64 per cent. for the presidency generally. The average assessment of a holding in Coimbatore District is also low, being rupees 11–9–10 against rupees 15–10–11 for the presidency, notwithstanding the fact that nearly half the puttas in Coimbatore are joint puttas.

As already remarked, the Board are sensible that, unless extensive observations are conducted for a long series of years all over the presidency, there must be more or less of uncertainty in all calculations of out-turn of produce; but they consider that the out-turn on which the assessment imposed by the Revenue Settlement are based must, in the present state of knowledge, be accepted for the districts concerned as the nearest approximation to the truth.

Turning to the estimates furnished by collectors for districts not settled, the Board consider that, though they are entitled to much less weight than the settlement out-turn, they may generally be accepted for present purposes. The fact that they differ widely is no argument for their rejection, as the settlement averages show that the out-turns of different districts vary within wide limits as specified below :—

Highest.		Lowest.		
2,197	Chingleput	1,219	Paddy	Cuddapah
1,421	Nellore	459	Cholum	Godavari
1,743	Chingleput	474	Ragi	Do.
1,104	Nellore	429	Cumbu	Do.

In a few instances, however, the collectors estimates seem obviously to require correction.

The out-turn estimated by the Collector of Vizagapatam (2,400 lbs. for paddy) has reference to a "good" crop; but as it is an average out-turn that is required, the Board consider that it will be better to adopt the general settlement average.

In the case of Tanjore, on the other hand, the collector's estimate of the out-turn of paddy, viz., 1,440 lbs. an acre, is evidently too low, as it is less than the general average obtained from the settlement returns. The selling price of land in this district is high; the harvests are generally plentiful owing to the almost never-failing irrigation that is obtained, and to the fertilising alluvial matter brought down by the rivers. There is thus every reason to believe that the out-turn cannot be less than in Godavari, viz., 1,938 lbs., and this rate will therefore be taken as applicable to Tanjore.

The average out-turn of paddy given by the Collector of North Arcot, viz., 2,500 lbs., appears high; but the experiments made by Mr. Rundall, the deputy director of Revenue Settlement, in three taluks of this district gave still higher results, viz., 2,693 lbs., and the collector's estimate may therefore be taken to represent the average for the district. Mr. Rundall attributes the comparatively large yield to the superior mode of cultivation pursued in North Arcot, the land being there invariably manured. For Madura the rate of yield—1,930 lbs. of rice or 2,900 lbs. of paddy, 1,170 lbs. of cholum, ragi, and cumbu—are very high and differ very materially from the sub-collector's estimates, which are given as 820 lbs. for paddy, 574 lbs. for cholum, 763 lbs. for ragi, and 328 lbs. for cumbu. The Board would adopt the general settlement average out-turn in the case of this district. For Malabar the rate of yield is the lowest reported, but the district is a hilly one, and the annual rainfall is sufficiently heavy to permit of rice crops being grown on much poorer land than that usually alloted to rice cultivation elsewhere. As will be seen hereafter, the estimate based on the out-turn reported from Canara goes to show that the district does not support its own population—a result for which the Board was not prepared. The collector's figures, however, are not low, and the error is probably in the statement of the area under crop, the district never having been surveyed.

The gross out-turn of food grain in each district is shown in the following statement, the calculation of the out-turn being based on the rates given by the Settlement Department and by collectors, with the modifications above noted. When for a particular grain the out-turn was not given by collectors, the general settlement average for that grain has been

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taken. The yield of the second crop is assumed to be one half that of the first. For paddy the equivalent in rice has been taken at two-thirds :—

	Tons.
Ganjam - - -	369,000
Vizagapatam - - -	338,000
Godavari - - -	601,000
Kistna - - - -	756,000
Nellore - - -	489,000
Cuddapah - - -	377,000
Bellary - - - -	796,000
Kurnool - - - -	452,000
Chingleput - - -	199,000
North Arcot - - -	440,000
South Arcot - - -	508,000
Tanjore - - - -	696,000
Trichinopoly - -	368,000
Madura - - - -	564,000
Tinnevelly - - -	444,000
Coimbatore - - -	508,000
Nilgiris - - -	7,000
Salem - - - -	647,000
South Canara - -	163,000
Malabar - - - -	175,000
Total - -	8,897,000

The next point to be considered is the quantity of grain consumed in each district. Grain generally is consumed (1) for seed and (2) for food. The estimates of collectors and of the Director of Revenue Settlement Department of the quantity of seed required for sowing an acre of land with paddy is as follows :—

Districts.	Quantity of Paddy Seeds required for an acre of Land. Lb.
Ganjam - - - - -	92
Vizagapatam - - - -	71
Godavari - - - -	41
Kistna - - - - -	108
Nellore - - - - -	62
Cuddapah - - -	58
Bellary - - - -	150
Kurnool - - - - -	47
Chingleput - - - -	55
North Arcot - - - -	130
South Arcot - - - -	65
Tanjore - - - - -	126
Trichinopoly - - - -	65
Madura - - - - -	75
Tinnevelly - - - -	138
Coimbatore - - -	55
Nilgiris - - - - -	—
Salem - - - - -	67
South Canara - - - -	81
Malabar - - - - -	145
Total - - -	1,631
Average - -	86

STATEMENT showing the quantity required for SEED in each DISTRICT of the MADRAS PRESIDENCY.

Districts. 1.	Total Acreage under Paddy. 2.	Seed required for an Acre in Paddy. 3.	Quantity of Rice or Cleaned Grain for the whole Acreage, weight in Rice taken equal to ⅔rds of the weight in Paddy. 4.	Area under Dry Grains. 5.	Quantity of Seed required for Dry Cultivation at 20 lbs. for an Acre. 6.	Total of Cols. 4 and 6. 7.	Remarks. 8.
	Acres.	Lbs.	Tons.	Acres.	Tons.	Tons.	
Ganjam - - -	7,07,000	92	20,000	3,16,000	3,000	23,000	The figures in col. 4 are ⅔rds of col. 2 multiplied by col. 3 reduced to tons.
Vizagapatam - -	4,00,000	71	9,000	5,14,000	4,000	13,000	
Godavery - -	8,19,000	41	10,000	3,70,000	3,000	13,000	
Kistna - - -	4,24,000	108	14,000	16,53,000	14,000	28,000	
Nellore - - -	4,09,000	62	7,000	12,77,000	11,000	18,000	
Cuddapah - -	1,58,000	58	3,000	13,48,000	12,000	15,000	
Bellary - -	1,49,000	150	6,000	27,75,000	25,000	31,000	
Kurnool - - -	67,000	47	1,000	16,94,000	15,000	16,000	
Chingleput - -	4,68,000	55	8,000	1,32,000	1,000	9,000	
N. Arcot - -	4,33,000	130	17,000	5,17,000	5,000	22,000	
S. Arcot - -	4,18,000	65	9,000	6,33,000	5,000	14,000	
Tanjore - - -	10,06,000	126	38,000	2,97,000	3,000	41,000	
Trichinopoly - -	2,16,000	65	4,000	7,85,000	7,000	11,000	
Madura - -	3,30,000	75	7,000	13,95,000	12,000	19,000	
Tinnevelly - -	2,46,000	138	10,000	11,33,000	10,000	20,000	
Coimbatore - -	91,000	55	2,000	21,02,000	19,000	21,000	
Nilgiris - - -	—	—	—	35,000	—	—	
Salem - - -	1,63,000	67	4,000	16,37,000	14,000	18,000	
S. Canara - - -	4,86,000	81	12,000	48,000	—	12,000	
Malabar - - -	5,85,000	145	25,000	8,000	—	25,000	
Total - -	75,75,000	1,631	2,06,000	186,69,000	1,63,000	3,69,000	
		Average 86					

STATEMENT showing the Calculations of Out-turn of FOOD GRAINS in the several Districts of MADRAS PRESIDENCY.

FOOD GRAINS.

DISTRICTS.	RICE.									CHOLUM.			RAGI.		
	First Crop Irrigated.			Second Crop Irrigated.			Unirrigated.								
	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.
1. Ganjam - - -	5,43,000	896	2,17,000	44,000	448	9,000	1,20,000	890	47,000	3,000	666	1,000	1,99,000	798	71,000
2. Vizagapatam - - -	3,80,000	1,081	1,83,000	—	540	—	20,000	890	8,000	21,000	666	6,000	1,03,000	770	35,000
3. Godavery - - -	6,62,000	1,292	3,81,000	3,000	646	1,000	1,54,000	1,017	70,000	1,17,000	1,421	74,000	28,000	1,743	22,000
4. Kistna - - -	2,67,000	1,344	1,60,000	1,000	672	—	1,56,000	640	45,000	6,49,000	992	2,87,000	25,000	770	9,000
5. Nellore - - -	3,84,000	1,077	1,84,000	11,000	538	2,000	14,000	890	5,000	6,40,000	459	1,31,000	66,000	770	23,000
6. Cuddapah - - -	1,27,000	1,465	83,000	27,000	732	9,000	4,000		1,000	4,67,000	551	1,15,000	1,30,000	657	38,000
7. Bellary - - -	1,08,000	900	43,000	36,000	450	7,000	5,000		2,000	11,72,000	320	1,67,000	1,11,000	500	2,48,000
8. Kurnool - - -	49,000	1,400	30,000	9,000	700	3,000	9,000		3,000	8,86,000	551	2,18,000	22,000	770	7,000
9. Chingleput - - -	3,62,000	813	1,31,000	55,000	406	10,000	51,000		20,000	9,000	666	3,000	44,000	474	9,000
10. N. Arcot - - -	3,02,000	1,667	2,25,000	1,22,000	833	45,000	9,000		3,000	35,000	600	9,000	1,47,000	800	52,000
11. S. Arcot - - -	3,21,000	1,206	1,73,000	51,000	603	13,000	46,000		18,000	23,000	1,013	11,000	1,56,000	922	64,000
12. Tanjore - - -	8,95,000	1,292	5,16,000	45,000	646	13,000	66,000	1,017	30,000	15,000	1,421	9,000	38,000	1,743	29,000
13. Trichinopoly - - -	1,39,000	1,119	69,000	59,000	559	15,000	18,000	890	7,000	1,76,000	690	54,000	1,23,000	834	46,000
14. Madura - - -	2,65,000	1,081	1,28,000	59,000	540	14,000	6,000		2,000	3,83,000	666	1,15,000	2,14,000	770	73,000
15. Tinnevelly - - -	2,16,000	1,189	1,15,000	30,000	594	8,000	—		—	1,49,000	666	44,000	83,000	770	28,000
16 Coimbatore - - -	71,000	1,1	37,000	19,000	583	5,000	1,000		—	6,80,000	521	1,58,000	2,32,000	496	52,000
17. Nilgiris - - -	—	—	—	—	—	—	—		—	—	—	—	4,000	357	—
18. Salem - - -	1,17,000	1,222	64,000	26,000	611	7,000	20,000		8,000	1,00,000	939	42,000	5,00,000	945	2,11,000
19. S. Canara - - -	2,00,000	1,008	90,000	1,76,000	504	40,000	1,10,000	472	23,000	—	—	—	4,000	770	1,000
20. Malabar - - -	3,94,000	707	1,24,000	1,10,000	353	17,000	81,000	890	32,000	—	—	—	3,000	770	1,000
Total - - -	58,02,000	—	29,53,000	8,83,000	—	2,18,000	8,90,000	—	324,000	55,30,000	—	14,44,000	22,32,000	—	10,19,000

STATEMENT showing the Calculations of Out-turn of FOOD GRAINS in the several Districts of MADRAS PRESIDENCY—*continued.*

FOOD GRAINS.

DISTRICTS.	VARAGU OR ARICALU.			CUMBOO.			KORRALU OR THENAY.			SAMAI.		PULSES.		MISCELLANEOUS CROPS.		Total Gross Out-turn of Food Grains in Tons.
	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Average Yield per Acre in Lbs.	Yield on the whole in Tons.	Area in Acres.	Yield on the whole at 600 Lbs. per Acre.	Area in Acres.	Yield on the whole at 450 Lbs. per Acre.	Area in Acres.	Yield on the whole at 600 Lbs. per Acre.	
0.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.
	Acres.	Lbs.	Tons.	Acres.	Lbs.	Tons.	Acres.	Lbs.	Tons.	Acres.	Tons.	Acres.	Tons.	Acres.	Tons.	Tons.
1. Ganjam - -	—	—	—	16,000	626	4,000	—	—	—	3,000	1,000	87,000	17,000	8,000	2,000	3,69,000
2. Vizagapatam - -	21,000	956	9,000	257,000	626	72,000	10,000	466	2,000	31,000	8,000	51,000	10,000	20,000	5,000	3,38,000
3. Godavery - -	5,000	956	2,000	14,000	1,104	7,000	14,000	406	2,000	14,000	4,000	1,43,000	29,000	35,000	9,000	6,01,000
4. Kistna - -	1,66,000	960	71,000	187,000	562	47,000	63,000	406	11,000	—	—	3,52,000	70,000	2,11,000	56,000	7,56,000
5. Nellore - -	1,43,000	736	47,000	111,000	429	21,000	18,000	496	3,000	—	—	1,18,000	23,000	1,86,000	50,000	4,89,000
6. Cuddapah - -	38,000	300	5,000	370,000	341	56,000	1,07,000	423	20,000	31,000	8,000	1,85,000	37,000	20,000	5,000	3,77,000
7. Bellary - -	13,000	956	5,000	226,000	230	23,000	—	—	—	6,89,000	1,84,000	5,04,000	1,01,000	60,000	16,000	7,96,000
8. Kurnool - -	1,43,000	956	61,000	97,000	626	27,000	3,39,000	381	58,000	—	—	1,55,000	31,000	52,000	14,000	4,52,000
9. Chingleput - -	55,000	819	20,000	17,000	626	5,000	—	—	—	—	—	5,000	1,000	2,000	—	1,99,000
10. N. Arcot - -	1,00,000	956	42,000	149,000	700	46,000	1,000	406	—	11,000	3,000	69,000	14,000	5,000	1,000	4,40,000
11. S. Arcot - -	1,97,000	1,485	1,30,000	224,000	921	92,000	—	—	—	6,000	1,000	24,000	5,000	3,000	1,000	5,08,000
12. Tanjore - -	1,45,000	956	62,000	57,000	1,104	28,000	—	—	—	—	—	31,000	6,000	11,000	3,000	6,96,000
13. Trichinopoly - -	1,81,000	1,208	98,000	185,000	638	53,000	1,000	406	—	35,000	9,000	84,000	17,000	—	—	3,68,000
14. Madura - -	1,76,000	956	75,000	228,000	626	64,000	18,000	406	3,000	2,06,000	55,000	1,31,000	26,000	34,000	9,000	5,64,000
15. Tinnevelly - -	74,000	956	31,000	465,000	626	1,30,000	2,000	406	—	2,24,000	60,000	1,19,000	24,000	17,000	4,000	4,44,000
16. Coimbatore - -	8,000	956	3,000	792,000	479	1,69,000	41,000	406	7,000	1,04,000	28,000	2,36,000	47,000	9,000	2,000	5,08,000
17. Nilgiris - -	—	—	—	—	—	—	13,000	604	3,000	6,000	1,000	—	—	12,000	3,000	7,000
18. Salem - -	1,23,000	956	52,000	464,000	802	1,66,000	20,000	406	4,000	90,000	24,000	3,24,000	65,000	16,000	4,000	6,47,000
19. S. Canara - -	—	—	—	—	—	—	—	—	—	—	—	43,000	9,000	1,000	—	1,63,000
20. Malabar - -	—	—	—	—	—	—	—	—	—		—	—	—	5,000	1,000	1,75,000
Total -	15,88,000	—	7,13,000	38,59,000	—	10,10,000	6,47,000	—	1,13,000	14,50,000	3,86,000	26,56,000	5,32,000	7,07,000	1,85,000	88,97,000

CHAP. I. Qn. 3.

MADRAS.

The Board of Revenue.

For dry grains the quantity required varies from 6 lbs. to 21 lbs. per acre. The Board consider that the quantity may be taken at 20 lbs. per acre for all grains, and this will leave an ample margin for wastage, &c. The quantity required in each district for seed will be as follows:—

	Tons.
Ganjam	23,000
Vizagapatam	13,000
Godavari	13,000
Kistna	28,000
Nellore	18,000
Cuddapah	15,000
Bellary	31,000
Kurnool	16,000
Chingleput	9,000
North Arcot	22,000
South Arcot	14,000
Tanjore	41,000
Trichinopoly	11,000
Madura	19,000
Tinnevelly	20,000
Coimbatore	21,000
Nilgiris	—
Salem	18,000
South Canara	12,000
Malabar	25,000
Total	369,000

To ascertain the food consumption the estimated average quantity consumed by an individual per diem has been multiplied by the total population. The collectors of all districts were asked to report the average quantity of grain consumed by adults above 12 years of age and juveniles below 12 years, and the estimates furnished by them are shown in the following table:—

STATEMENT showing the quantity of Food consumed by each Individual per Diem.

Districts.	Male Adult.	Boy.	Female Adult.	Girl.
	Lb.	Lb.	Lb.	Lb.
Ganjam	2 to 2½	1 to 1¼	2 to 2½	1 to 1¼
Vizagapatam	2	1	2	1
Godavari	2	1	2	1
Kistna	2	¾	2	¾
Nellore	2	½ to 1	1⅞	½ to 1
Cuddapah	1½	¾	1½	¾
Bellary	2	1¼	2	1¼
Kurnool	1	½	1	½
Madras	1½	¾	1½	¾
Chingleput	2	⅔ to ⅞	1½	⅔ to ¾
North Arcot	1½	¾	1½	¾
South Arcot	Rice 1¾ Cumbu 2¾ Ragi 2¼ Cholum 3½	Rice ⅞ Cumbu 1⅜ Ragi 1⅛ Cholum 1¾	Rice 1¾ Cumbu 2¼ Ragi 2¼ Cholum 3½	Rice ⅞ Cumbu 1⅜ Ragi 1⅛ Cholum ¾
Tanjore	1½	¾	1½	¾
Trichinopoly	1½	¾	1½	¾
Madura	2	1	2	1
Tinnevelly	1½	¾	1½	¾
Coimbatore	2	½	2	½
Nilgiris	1¾ to 2	¾ to 1	1¾ to 2	¾ to 1
Salem	⅞ to 2½	¼ to ¾	1 to 3	⅜ to ¾
South Canara	1½	½	1½	½
Malabar	1·85	·93	1·85	·93

The Sanitary Commissioner, who was at the same time asked for information on the subject, states: "In regard to calculations regarding average grain consumption, it may be assumed that two-thirds of the people require a full average ration, and of the remaining one-third, half will require a half ration and the other half a quarter.

"These are rough calculations but founded on the relative ages and the number above and below 10 years of age, and of the latter taking a separate account of those from 0 to 5.

"Assuming, therefore, that 24 ounces of cereal grain represents the average consumption of an adult, the following quantities will be required for the daily sustenance of a population of 100 persons—

	Lb. of Grain.
66 adults (above 10 years)	99
17 children (from 5 to 10 years)	12·75
17 infants (from 0 to 5 years)	6·37
	118·2

"It would be safe to allow a margin on this calculation, and to reckon that each 100 of the population require from 120 to 125 lbs. of grain per diem, say 1¼ lbs. per head all round. It is by no means intended that the people restrict themselves to the consumption as above calculated, but jail experience shows that 24 ounces of millet with meat, dhal, vegetables, salt, and condiments is sufficient to prevent excessive bodily waste under the moderate exertion involved in jail labour.

"The domestic consumption of grain is no doubt influenced by abundance or scarcity."

It will be observed that the consumption of grain by an adult is estimated by all collectors, except that of Kurnool, at either 1½ lbs. or more than that quantity. Generally, food consumption would seem to be much greater in the northern than in the southern districts as might perhaps be expected, from the difference in physique. Mr. Crole, the collector of Kurnool, however, states that an allowance of 1 lb. of grain for an adult and ½ lb. for a juvenile is ample. The Board will not attempt to reconcile the different statements as the question will doubtless be fully considered by the Famine Commission in all its bearings in connection with the rate of wages to be allowed for famine labour. For the purpose of the calculation of the total consumption of grain in each district the Board have adopted Dr. Cornish's estimate, supported as it is by the majority of the collectors. Calculated at the rate of 1¼ lbs. per individual, the total consumption of corn in each district will be as follows:—

	Tons.
Ganjam	283,000
Vizagapatam	376,000
Godavari	324,000
Kistna	296,000
Nellore	280,000
Cuddapah	275,000
Bellary	340,000
Kurnool	195,000
Madras	81,000
Chingleput	191,000
North Arcot	410,000
South Arcot	357,000
Tanjore	402,000
Trichinopoly	244,000
Madura	462,000
Tinnevelly	345,000
Coimbatore	359,000
Nilgiris	10,000
Salem	401,000
South Canara	187,000
Malabar	460,000
Total	6,278,000

Deducting from the total out-turn the quantity consumed as food, and that expended as seed, the deficiency which must be made up by importation or the excess available for export is arrived at. The following table gives the information. A column is added to show the actual exports and imports by sea for a typical year, viz., 1875–76. No information is available in regard to the exports by land:—

Districts.	Quantity of Food Grain available for Export or Deficiency to be made up by Import.	Imports by Sea in 1875-76.	Exports by Sea in 1875-76.
	Tons.	Tons.	Tons.
1. Ganjam	63,000	—	18,000
2. Vizagapatam	—51,000	5,000	1,000
3. Godavari	264,000	1,000	39,000
4. Kistna	432,000	1,000	20,000
5. Nellore	241,000	2,000	3,000
6. Cuddapah	87,000	—	—
7. Bellary	425,000	—	—
8. Kurnool	191,000	—	—
9. Madras	—81,000	43,000	7,000
10. Chingleput	— 1,000	—	—
11. North Arcot	8,000	—	—
12. South Arcot	137,000	2,000	16,000
13. Tanjore	243,000	6,000	83,000
14. Trichinopoly	113,000	—	—
15. Madura	83,000	6,000	1,000
16. Tinnevelly	79,000	9,000	1,000
17. Coimbatore	128,000	—	—
18. Nilgiris	— 3,000	—	—
19. Salem	228,000	—	—
20. South Canara	—36,000	3,000	29,000
21. Malabar	—310,000	67,000	9,000
Total	2,250,000	145,000	227,000

According to the above calculation, the average surplus quantity of grain is about 36 per cent. of the quantity consumed as food and as seed. Mr. Benson makes out that the grain produced is barely sufficient to feed the population. This can hardly be the case, as recent famine experience has shown that, notwithstanding three successive bad seasons, there were considerable stocks in the country, on which the population, to a great extent subsisted, the quantity of imported grain bearing but a small proportion to the quantity required by the population for food.

The Board must, however, here mention that they do not present the above estimates with any very great confidence, resting as they do to a great extent upon hypothetical data, and seeing that a slight error in any one particular may vitiate the whole result and show an exporting district as unable to support its population, and *vice versâ*. Taking, for instance, the great rice-growing district of Tanjore, if the collectors estimate of average out-turn be adopted and the assumed rate of consumption per individual per diem be increased by ever so small a quantity, say 4 ozs., the surplus grain of the district will disappear, and the amount produced will be barely sufficient to maintain the population. The consumption of grain in the country doubtless rises and falls with abundant harvests or the reverse.

Chap. I. Qn.

Madras.

The Board

Revenue.

Method of collecting these statistics and the amount of reliance to be placed upon them.—For ryotwari and inam lands information regarding cultivation is collected by the village accountants, and it may be considered fairly reliable. From zemindaris the greatest difficulty is experienced in getting any statistical information, as the office of village curnam or accountant is not properly maintained, and collectors are powerless to punish the recusant curnams or to see that the office is held by qualified men, jurisdiction in regard to these matters being vested in the civil courts. The Board have recommended legislation with a view to placing zemindari curnams under the authority of collectors, and the proposal is under the consideration of Government. It will be simply impossible to get any agricultural statistics at all worth having unless this is done.

As to out-turn of produce in the cultivated area, no reliable information can be obtained unless a large and expensive establishment is entertained to check carefully and intelligently any estimates that may be given by the village accountants. It is an indisputable fact that the present taluk establishments are overworked and unable to cope with the existing work, and it would be extremely undesirable to impose upon them any additional duties. The Board have submitted proposals for strengthening the taluk establishments with a view to rendering them more efficient; but Government, while admitting the necessity of doing something, have been obliged to postpone the consideration of the question for financial reasons. This question of collecting statistical information was dealt with in Board's Proceedings, dated 15th March 1876, No. 739.

RAJPUTANA.

Rajputa

Alwar.—*Capt. Law.*—With reference to statistics required showing the average area in each district under cultivation yearly, Major Powlett, in his *Gazetteer of Alwar*, gives, at page 188, the following statement as to the amount of land cultivated; but it refers to only fiscal villages, which comprise about five-sixths of the state:—

TOTAL CULTIVATED.			Culturable.	Unculturable.	Revenue Free in Fiscal Villages.	Total.
Irrigated.	Unirrigated.	Total.				
316,279	1,026,309	1,342,588	252,642	740,344	82,404	2,417,978

N.B.—These figures are higher (see answer 4) and should be converted into acres at 5 bighas = 2 acres.

The same work gives some more information demanded in this question; and below is given an extract from page 87:—

"The following figures show approximately the relative proportions of the areas covered by the crops chiefly grown:—

Bajra - -	·331 of the whole cultivated area.
Barley - -	·119 „ „
Joár - -	·089 „ „
Gram - -	·071 „ „
Cotton - -	·069 „ „
Indian-corn -	·023 „ „
Wheat - -	·021 „ „
Sarsu - -	·007 „ „
Miscellaneous -	·276 of the whole cultivated area, chiefly pulses.

"In this computation the double-cropped land has been counted twice, in order that the crops for one whole year might be taken into account.

"The land under sugar-cane was about 2,000 acres, that under tobacco about 1,200, and the opium only about 450. But, as the survey was made preparatory to assessment, the people had no doubt devoted a smaller area than usual to these valuable crops.

"The average yield of bajra land (unirrigated) varies from 2½ to 12½ maunds the acre, according to soil. Usually, several pulses are grown with the bajra, and make about a third of the above estimate, though sometimes, owing to the character of the season, the yield of pulse greatly exceeds that of bajra grown with it. Irrigated barley has been estimated at from 10 to 35 maunds the bigha; gram (unirrigated) at 10 to 30 maunds; cotton (irrigated) at 3¾ to 12½ maunds (including seed)."

From a rough calculation as to the produce of the land and the requirements of the population, sowing operations included, it would appear that the consumption of food grains in this state would be at 20·02 per head per diem about 46,36,179 maunds per annum; and that the yield being some 50,75,604, there would remain about 4,39,425 for exportation. The books of the Customs Department give the following results:—

Year.	Export.	Import.	Excess of Export over Import.
	Mds.	Mds.	Mds.
1871	2,27,258	67,967	1,59,291
1874	9,70,302	76,423	8,93,879
1875	3,69,068	1,55,132	2,13,936
1876	3,85,384	1,23,073	2,62,311

The average excess of food grain exported over imported during these four years was therefore 3,82,354 maunds.

P. I. Qn. 3.

AJPUTANA.

Dholpur.—Lieut.-Col. Dennehy.—The average area under cultivation in the entire state of Dholpur is 262,569 acres. Of this 231,327 acres are under *food crops*, of which 29,300 acres give two crops a year.

The average amount produced per acre is :—

Of wheat - - -	25 maunds.
Of barley - -	30 „
Of gram - - -	12 „
Of bajra - -	10 „
Of joár - - -	10 „
Of urd - - -	7 „
Of mote - - -	10 „
Of arhar - -	12½ „

The total consumption of the state is per annum about 1,727,500 maunds, and a surplus of about 1,501,866 maunds, chiefly of wheat, barley, and gram, remains for export.

The more valuable crops are generally limited to the fields close to the village site, to which also generally the means of irrigation are confined, and on which the manure procurable in the village can more readily be made available.

The superior kinds of crops, such as wheat, joár, &c., &c., and certain of the good miscellaneous crops, occupy only 33 per cent. of the cultivation, whereas the inferior grains, bajra, mote, bejhra, gram, and barley (both of which last in ordinary years are decidedly inferior), cover 67 per cent.

The proportion of kharif to rabi crops are 66½ per cent. of the former to 33½ per cent. of the latter on the total cultivated area.

These statistics are the result of repeated and careful inquiries made by me previous to the late scarcity; they have been further controlled by the information collected during the land settlement operations lately going on in the state.

Kotah.—Major Powlett.—I have no statistics of cultivation of any state but Kotah. But I believe that Boondee and the City pargana of Tonk have little good culturable waste. Other parganas of Tonk and Kotah have, owing to mismanagement, much waste now which was once cultivated.

In Colonel Tod's time Kotah was governed by the ablest minister in Rajputana: and Colonel Tod says there was then little culturable waste. Now there are at least 150,000 acres; but it is being fast broken up. Taking three villages situated in different parganas, I find that of 10,400 cultivated bighas, 9,012 were under food crops, or 86·5 per cent.

The average yield per acre of the chief food crops, namely, wheat (unirrigated barley is little grown), gram, and joár, are said to average on land well but recently broken up from 4 to 8 maunds, 8 to 15 maunds, and 5 to 9 maunds respectively. But 20 years of incessant cultivation will reduce this capacity of production 40 per cent. In good well-land the yield is 35 maunds in the year. The irrigated food crop is generally barley or makka, followed by wheat. The amount of grain exported from Kotah averaged during the last two years 13,700 tons. This was chiefly wheat and gram.

Grain is never, I believe, imported into Haraoti, which is a great grain-supplying tract. Colonel Tod records that "in Sambat 1860 (A.D. 1804), during the Mahratta War, when Holakr was in the Bhartpur State, and predatory armies were moving in every direction, and when famine and war conjoined to desolate the country, Kotah fed the whole population of Rajwara, and supplied all these roving hordes. In that season grain being Rs. 55 the 'mauni' (12 maunds of 75 lbs. each), he (the minister mentioned below) sold to the enormous amount of one crore of rupees, or a million sterling."

This grain was stored in pits situated in high and dry places. At present the British cantonment of Neemuch is dependent on Kotah for much of the grain that it consumes; and Boondee exports to Deolee, Nusseerabad, and Ajmere.

Bhartpur.—Mr. Spencer.—The area under cultivation amounts to 1,692,892 bighas, but there are no data to distinguish food crops from others. An estimate will, however, be hazarded; if two lakhs of bighas be assigned to cotton, indigo, sugar-cane, carrots, &c., &c., the remaining area, 1,492,892, would be under cultivation of food crops. Six maunds is perhaps the average out-turn of each bigha; at this rate the total out-turn of the state would approximately be 8,957,352 maunds, and taking 6 maunds and 30 seers as the amount of consumption by each individual, the total consumption of the state, which has a population of 7 lakhs, would be 4,725,000 maunds. It is impossible to give even an estimate of the corn consumed by the cattle.

ENTRAL INDIA.

Wingate.

CENTRAL INDIA.

—	Total Area cultivated.	Under Food Grains.	Average Produce per Acre.	Total Produce.	Consumption.	Available for Export.
	Acres.	Acres.	Maunds.	Maunds.	Maunds.	Maunds.
Bhopal - - - - -	1,570,000	1,413,000 or 9-10ths.	3	4,239,000	1,855,000 or 7-16ths.	2,384,000 or 9-16ths.
Rutlam - - - -	284,500	256,000 or 9-10ths.	3	768,000	1,042,000	Deficit 274,000, supplemented from hilly tracts.
Manpur Pergunnah - -	2,836	2,415	6	18,824 in 1877.	19,787 at 1 lb. per head.	—

N.B.—In Baghelkhand—Wheat per acre 6 to 7 maunds.
Kodoo „ 7 „ 8 „
Rice „ 6 „ 7 „

HYDERABAD.

CHAP. I. Q.

HYDERAB

Moulvie M
Ali.

The following statement taken from the Administration Report prepared in the Revenue Minister's office, will show the area under cultivation in each district in the year 1284 Fasli, (A.D. 1874) distinguishing food crops from others :—

District. 1.	Land under Food Crops. 2.	Land under other Crops. 3.	Total. 4.	Per-centage of Area under Food Crops to Total Area. 5.	Per-centage of Area under other Crops to Total Area. 6.
	Acres.	Acres.	Acres.		
Mayduk - -	127.688	9,828	137,516	92·9	7·1
Indur - -	146,446	54,018	200,464	73·06	26·94
Yelgundul - -	371,084	62,372	433,456	85·6	14·4
Sirpur-Tandur -	128,180	53,821	182,901	70·4	29·6
Khummum - -	379,328	51,490	430,818	88·04	11·96
Nulgunda - -	373,774	100,565	474,339	78·8	21·2
Nagur-Kurnul -	268,634	55,646	324,280	82·9	17·1
Total Telingana -	1,795,134	387,740	2,182,874	82·2	17·8
Aurungabad - -	1,305,795	116,292	1,422,087	91·8	8·2
Beed - -	1,242,351	255,141	1,497,492	82·9	17·1
Purbhani - -	815,161	191,422	1,006,583	80·9	19·1
Beeder - -	306,800	76,109	382,909	80·1	19·9
Nandair - -	544,275	299,896	844,171	64·5	35·5
Naldrug - -	389,346	114,884	504,230	77·2	22·8
Gulburga - -	332,980	53,806	386,786	86·1	13·9
Shorapur - -	432,603	130,889	563,492	76·8	23·2
Raichur - -	590,283	206,386	796,669	74·1	25·9
Lingsugur - -	709,664	167,220	876,884	80·9	19·1
Total Mahratwari	6.669,258	1,612,045	8,281,303	80·6	19·4
Grand Total. -	8,464,392	1,999,785	10,464,177	80·9	19·1

Average amount of food grains produced per acre.—To this question no satisfactory categorical answer can be given. There are no means of defining precisely the different qualities of land in various taluks, the amount of out-turn in each for any series of years, the variations of the seasons, rainfall, its distribution, &c. From 20 years experience acquired during my employment in the Revenue Department under the British Government, I can safely state that it is very difficult to form any very exact estimate of out-turn.

For the last three years I, as well as most of the talukdars, have been very carefully conducting inquiries in His Highness the Nizam's dominions; but still it cannot be said that the result has been such as may be fully relied on.

The explanation of this want of success will be found in the fact that there are only three methods of acquiring information on the subject, and that each of them is wholly or partially defective. The first and the most generally adopted method is to get the required information from the cultivators themselves; but they, when questioned on the subject, avoid giving any reliable information on the supposition that any increase, real or supposed, in the out-turn would lead to a corresponding enhancement in the revenue dues. Any conclusion drawn from their statements would certainly therefore be fallacious and necessarily incorrect, nor would they even furnish a basis for any estimate of the minimum out-turn. The second method is to compare the statement of the cultivators with the saukars books, for in most cases the cultivators make over to the saukars the produce of their fields. This method though much better than the former, is subject to two great errors. In the first place the amount of produce consumed by the cultivator himself or given to the labourers employed, or the portion reserved for seed, is not entered in the saukars books, and in the second place, the saukar himself is unreasonably afraid to give the correct account, and generally he avoids doing so. The third and the most accurate method is to weigh the produce of the field as soon as it is reaped. But in this, as in the preceding cases, so many contingencies have to be allowed for, such as the quality of the land, the nature of the season, the quantity of manure applied, and the different methods of agriculture employed, that though the produce of the fields subjected to this mode of inquiry may be accurately determined for one season, an estimate deduced therefrom for a whole taluka, district, or province will not be correct.

I have made many experiments by this third method but always discovered vast discrepancies in the results. I have seen fields of the best description which, owing to idleness on the part of the cultivators, have produced a less quantity of grain than that of the poorest kind of land which had been well manured, or which owing to temporary causes produced a splendid crop one year and a miserable one the next. Not to speak of a whole province, the determination of the amount of the produce per acre of a taluka, therefore, appears to me to be a matter in which disappointment is generally the result.

However, the results of the special inquiries, conducted by me and by the talukdars on this subject, are embodied in the following tables :—

RESULT of INQUIRIES conducted by TALUKDARS.

District.	Taluka.	Inquiring Officer's Name.	Kind of Crops.	Class of Soil.	Average Produce per Acre in Maunds of 40 Seers (Seer equal to 80 Tolas).
			TELINGANA.		
Mayduk - -	Kallabgur -	Mr. Hassan bin Abdulla, 1st Talukdar.	Yellow joár - -	1st class - -	8
			,, - -	2nd ,, - -	5
			White joár - -	1st ,, - -	11
			,, - - -	2nd ,, - -	8
			White - - -	1st ,, - -	8
			,, - - -	2nd ,, - -	6
			Paddy abi - - -	1st ,, - -	65
			,, - - -	2nd ,, - -	48
			,, - - -	3rd ,, - -	32
			Paddy tabi - - -	1st ,, - -	99
			,, - -	2nd ,, - -	65
			,, - - -	3rd ,, - -	48
Indur - -	Baswada - -	Moulvi Nazir Ahmud, Sudder Talukdar.	Savan - - -	1st ,, - -	9
			,, - - - -	2nd ,, - -	7
			Kodru - - -	1st ,, - -	13
			,, - - - -	2nd ,, - -	11
			Paddy abi - -	1st ,, - -	54
			,, - - -	2nd ,, - -	43
			,, - - -	3rd ,, - -	32
			White joár - -	1st ,, - -	13
			,, - - -	2nd ,, - -	11
			Paddy tabi - -	1st ,, - -	75
			,, - - -	2nd ,, - -	64
			,, - - -	3rd ,, - -	55

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ulvie Mahdi Ali.

District.	Taluka.	Inquiring Officer's Name.	Kind of Crops.	Class of Soil.	Average Produce per Acre in Maunds of 40 Seers (Seer equal to 80 Tolas).
Indur	Yellareddy Pet	Moulvi Nazir Ahmud	Kodru	1st class	17
			„	2nd „	14
			„	3rd „	10
			White joár	1st „	9
			„	2nd „	7
			„	3rd „	5
			Paddy abi	1st „	44
			„	2nd „	35
			„	3rd „	26
			Paddy tabi	1st „	70
			„	2nd „	52
			„	3rd „	35
Kummum	Wurrungul	Mr. Swami Rao, Sudder Talukdar.	Yellow joár	1st „	6
			White „	„ „	13
			Gram	„ „	4
			Tur	„ „	4
			Paddy abi	„ „	25
			„ tabi	„ „	21
			Maize	„ „	11
Nagur-Kurnul	Nagur-Kurnul	Mr. Narsingha Rao, 2nd Talukdar.	Yellow joár	„ „	6
			Bajra	„ „	6
			White joár	„ „	5
			Paddy abi	„ „	27
			„ tabi	„ „	34
Purbhani	Purbhani	Mr. Shaik, Bahauddin, 1st Talukdar.	Paddy	„ „	21
			Yellow joár	„ „	11
			Tur	„ „	9
			White joár	„ „	18
			Wheat	„ „	11
			Gram	„ „	11
Gulbarga	Saydam	Mr. Syed Asadulla, 1st Talukdar.	White joár	„ „	4
			Wheat	„ „	4
			Gram	„ „	4
Atraf Balda	Atraf Balda	Mr. Shaik Gulamali, Madadgar Talukdar.	Yellow joár and bajra	„ „	4
			White joár	„ „	5
			Paddy abi	„ „	41
			„ tabi	„ „	54

The result of my own inquiries, based on the third method and conducted in 11 villages in the Paitan Taluka in 1285 Fusli (1875–76) is given below :—

Village.	No. of Fields Experimented Upon.	Average Produce per Acre in Maunds.					
		Primary Crop.		Subordinate Crop.		Total.	
		M.	S.	M.	S.	M.	S.
Tandulwadi	5	7	14	2	22	9	36
Sonwadi (Khurd)	2	13	28	2	22	16	10
Mehomedpur	3	7	22	1	18	9	0
Telwadi	3	6	26	—		6	26
Sonwadi (Buzarg)	3	7	33	2	0	9	33
Kausan	2	9	3	—		9	3
Lingatpuri	4	6	39	—		6	39
Ghori	1	4	1	2	0	6	1
Ismailpur	2	7	15	2	0	9	15
Changatpuri	2	5	1	1	27	6	28
Saigaon	1	8	29	2	0	10	29
Total	—	84	11	16	9	100	20
Average	—	7	26	1	19	9	5

From this it will appear that 28 fields were reaped and the produce of each was weighed. The highest amount of produce per bigha is shown in it as 13 maunds 24 seers, of which the principal crop—joár—weighed 11 maunds 32 seers, and the subordinate crop, 1 maund 32 seers, which give per acre 18 maunds 11 seers (=1,498 lbs. *avoirdupois*). The lowest amount of produce per bigha is 4 maunds 20 seers, of which joár was 3 maunds, while the subordinate crop 1 maund 20 seers, or 6 maunds 2 seers (=494 lbs.) per acre.

Inquiries were conducted by district officers in 1287 Fasli (1877–78) in eight districts, and the average results were as follows :—

Crop.	No. of Fields Experimented on.	Produce per Acre.	
		Maunds.	Seers.
Joár	12	9	36
Wheat	1	8	20
Bajra	1	4	28
Paddy	3	46	21

The Talukdar of Aurungabad has submitted the result of his inquiry for 1288 Fusli (1878–79), which is as follows :—

In nine fields of joár the average produce was 9 maunds 3 seers.

The following table will show the rough average for the two natural divisions of the country, Telingana and Maratwari :—

Chief Food Grain.		Produce per Acre in Maunds.	
		Telingana.	Maratwari.
Kharif	Yellow joár	6	8
	Bajra	5	7
	Kodru	10	8
	Sanvan	8	18
	Paddy (abi)	30	15
	White joár	5	8
	Wheat	3	4
	Paddy (tabi)	35	—

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HYDERABAD.

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A rough estimate of total cultivated area, produce, consumption, and the surplus that remained for export in the year 1284, A.D. 1874, Fasli, is given below :—

District.	Cultivated Area of Food Produce.	Estimated Amount of Food Produce.	Population.		Amount in Maunds of Food Consumed at the Rate of 12 Chitaks per Head per Diem, or 19 Maunds per 1,000 Souls, or 6,939 Maunds or $247\frac{21}{23}$ Tons per Year.	Balance of Store for Export.
			Of District.	Per Sq. Mile Cultivated Area.		
			TELINGANA.			
Maydak	Acres 1,27,688	43,60,654 Mds.	1,56,079	726	10,82,408 Mds.	32,78,246 Mds.
	Sq. miles 199	1,55,737 Tons	—	—	38,657 Tons	1,17,080 Tons
Indur	Acres 1,46,446	45,82,464 Mds.	2,43,298	777	16,87,272 Mds.	28,95,192 Mds.
	Sq. miles 229	1,63,659 Tons	—	—	60,260 Tons	1,03,399 Tons
Yelgandal	Acres 3,71,084	76,22,221 Mds.	4,60,610	680	31,94,330 Mds.	44,27,891 Mds.
	Sq. miles 580	2,72,222 Tons	—	—	1,14,083 Tons	1,58,139 Tons
Sirpur Tandur	Acres 1,28,180	11,34,293 Mds.	1,47,973	521	10,26,193 Mds.	1,08,100 Mds.
	Sq. miles 200	40,510 Tons	—	—	36,650 Tons	3,860 Tons
Khummum	Acres 3,79,328	64,61,368 Mds.	2,70,250	402	18,74,184 Mds.	45,87,184 Mds.
	Sq. miles 593	2,30,762 Tons	—	—	66,935 Tons	1,63,827 Tons
Nulgunda	Acres 3,73,774	41,54,184 Mds.	2,26,619	306	15,71,603 Mds.	25,82,581 Mds.
	Sq. miles 584	1,48,363 Tons	—	—	56,129 Tons	92,234 Tons
Nagur-Kurnal	Acres 2,68,634	41,06,356 Mds.	1,57,184	310	10,90,071 Mds.	30,16,285 Mds.
	Sq. miles 420	1,46,656 Tons	—	—	38,931 Tons	1,07,725 Tons
Total Telingana	Acres 17,95,134	3,24,21,540 Mds.	16,62,013	487	1,15,26,061 Mds.	2,08,95,479 Mds.
	Sq. miles 2,805	11,57,909 Tons.	—	—	4,11,645 Tons	7,46,264 Tons
			MAHRATWARI.			
Aurungabad	Acres 13,05,795	88,35,904 Mds.	3,31,702	149	22,00,353 Mds.	66,35,551 Mds.
	Sq. miles 2,040	3,15,568 Tons	—	—	78,584 Tons	2,36,984 Tons
Beed	Acres 12,42,351	1,06,65,705 Mds.	2,58,338	110	17,91,574 Mds.	88,74,131 Mds.
	Sq. miles 1,941	3,80,918 Tons	—	—	63,985 Tons	3,16,933 Tons
Purbhani	Acres 8,15,161	58,47,874 Mds.	2,76,620	176	19,18,360 Mds.	39,29,514 Mds.
	Sq. miles 1,274	2,08,853 Tons	—	—	68,513 Tons	1,40,340 Tons
Bidar	Acres 306,800	2,318,961 Mds.	212,001	355	1,470,227 Mds.	848,734 Mds.
	Sq. miles 480	82,820 Tons	—	—	52,508 Tons	30,312 Tons
Nandair	Acres 544,275	3,660,480 Mds.	347,612	264	2,410,689 Mds.	1,249,791 Mds.
	Sq. miles 851	130,731 Tons	—	—	86,096 Tons	44,635 Tons
Naldrug	Acres 389,346	1,636,682 Mds.	267,180	339	1,852,893 Mds.	—216,211 Mds.
	Sq. miles 608	58,452 Tons	—	—	66,175 Tons	—7,723 Tons
Gulburga	Acres 332,980	2,256,317 Mds.	198,043	328	1,373,428 Mds.	882,889 Mds.
	Sq. miles 520	80,583 Tons	—	—	49,051 Tons	31,532 Tons
Shorapur	Acres 432,603	3,518,058 Mds.	272,345	309	1,888,712 Mds.	1,629,346 Mds.
	Sq. miles 676	125,645 Tons	—	—	67,454 Tons	58,191 Tons
Raichur	Acres 590,283	3,031,607 Mds.	295,848	238	2,051,706 Mds.	979,901 Mds.
	Sq. miles 922	108,272 Tons	—	—	73,275 Tons	34,997 Tons
Lingasugur	Acres 709,664	3,012,363 Mds.	251,911	184	1,747,003 Mds.	1,265,360 Mds.
	Sq. miles 1,109	107,584 Tons	—	—	62,393 Tons	45,191 Tons
Total Mahratwari	Acres 6,669,258	44,783,951 Mds.	2,711,600	209	18,704,945 Mds.	26,079,006 Mds.
	Sq. miles 10,421	1,599,426 Tons	—	—	668,034 Tons	931,392 Tons
Grand Total	Acres 8,464,392	77,205,491 Mds.	4,373,613	267	30,231,006 Mds.	46,974,485 Mds.
	Sq. miles 13,226	2,757,335 Tons	—	—	1,079,679 Tons	1,677,656 Tons

From the above statement it will appear that in a good year about 1,677,000 tons of grain are left for export or store, taking both provinces together.

From experience it may be confidently stated that the surplus remaining for export and store never falls below the above estimate in a favourable year. It will also be seen that the produce in a favourable year is sufficient to cover the consumption of food grains by His Highness the Nizam's subjects for two years.

From the experience acquired during the famine of 1286 and 1287 Fasli (1876–77–78), it would appear that although the produce continued to decrease below the average for three successive years, no great complaint of scarcity of grain was ever made throughout the famine.

There are, however, two points to be taken into consideration in connection with this account. The estimated out-turn is for a good year, and no deductions have been made for seed and wastage, which will be done now. Then again, the number of population given is taken from the patwaris records, which is much below the actual number, as has been stated elsewhere. Taking an average of the past eight years, we may estimate the annual out-turn of food grains at 1,948,000 tons, in place of 2,757,000 tons, as has been estimated for the year 1284. In place of a population of 43,73,600, we have now estimated it at 56,85,700, increasing it by 30 per cent. The consumption is set down at 480 lbs., or 6 maunds per head per annum. In estimating this some allowance has been made for infants, &c.

The consumption may therefore be set down at 1,218,000 tons, the wastage at 57,000 tons, aggregating in all 1,372,000 tons. The balance available for export or store is about 576,000 tons. Further details regarding this subject will be found in answer to question IX.

The figures supplied by the Customs Department show that the grain exported from His Highness the Nizam's dominions in 1286 (1876–77), which was a year of drought and scarcity, amounted to 3,510,880 maunds (125,389 tons), and consisted chiefly of joár, the principal produce of Maratwari. It must also be remembered that of the grain imported into His Highness the Nizam's territories (which in 1286 Fasli amounted to 2,914,753 maunds=104,098 tons, including 408,000 maunds=14,571 tons grain exported from the mofussil districts into the city of Hyderabad: the net amount imported from the British territories being 89,527 tons), a large proportion goes to supply the requirements of the large population of the city of Hyderabad and of the cantonment of Secunderabad.

In 1286 Fasli (1876–77) the articles imported into His Highness' dominions were chiefly wheat, gram, and rice—food grains scantily produced in that year :—

	Wheat.	Gram.	Rice.	Total.
Maunds	427,806	353,330	1,301,952	2,083,088

ap. I. Qn. 4.

PUNJAB.

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CHAPTER I.—QUESTION 4.

What area of your province and of its several districts is protected from drought in an average year by irrigation from wells, tanks or jhils, canals, or channels from rivers? To how much of this area is the protection complete and permanent, and how much is dependent on the local rain? How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area? What is the effect of irrigation of crops (other than food crops) in adding to the powers of the population to resist famine? Supposing canals, tanks, wells, and jhils to be utilized to the utmost extent and kept in the highest possible order, what extent of the country would be protected from drought in a year when there was a failure of the rain?

PUNJAB.

With regard to the first part of this question, statistics have been received from district officers, and are compiled in a statement appended. It will be seen from it that (speaking in round numbers) of an annual average crop area amounting in 21 millions we have—

	Millions of Acres.		
	Irrigated.	Unirrigated.	Total.
Under food grains, pulses included.	4½	14	18½
Under other crops - -	1	1½	2½
Total - - -	5½	15½	21

Of the 14 million acres of unirrigated food grains, about 1½ millions are grown on sailab land; that is to say, on the moist alluvial lands situate in the beds and on the banks of the Punjab rivers, where, owing to the excessive dews and percolation from the rivers, very little rain is needed by the crops.

In a country such as the Punjab, where the rainfall varies from an abundant and almost certain supply in the submontane districts to a quantity in the southern tracts so small that cultivation is possible only where aided by irrigation or river sailab, next in importance to a knowledge of the extent of irrigation is to know how much of the unirrigated food crops are grown under an abundant rain-fall.

The leading facts on the subject, shown in the statement appended (summarised for more convenient reference in the foot-note below*), indicate the follow-

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*The rain-fall given is that of the head-quarter station of each division. As regards Rawalpindi it exceeds the average of the division; in Peshâwar it understates it. For corrections on this point, *see* the next foot-note, where the fall of each district is given. As regards the two last columns of the statement, it cannot be stated exactly how much sailab land is under food grains, but it may be taken broadly that nearly all is. The area irrigated and not under food grains is added for convenience of reference, as it has an obvious bearing on the subject under discussion.

Division.	Rain-fall.	Harvest.	Area of Food Grains.			Sailab Area.	Area Irrigated which is not Cultivated with Food Crops.
			Total.	Of which Irrigated.	Balance Unirrigated including Sailab.		
Delhi - - -	25·5	Rabi - - -	8,29,665	3,59,775	4,69,890	-	
		Kharif - - -	10,66,331	1,81,850	8,84,481		
		Total - -	18,95,996	5,41,625	13,54,371	13,500	1,09,351
Hissar - - -	16·9	Rabi - - -	6,10,140	1,18,210	4,91,930		
		Kharif - - -	23,60,952	49,624	23,11,328		
		Total - -	29,71,092	1,67,834	28,03,258	3,52,610	51,220
Umballa - - -	35·3	Rabi - - -	8,98,977	1,16,560	7,82,417		
		Kharif - - -	6,80,031	1,65,815	5,14,216		
		Total - -	15,79,008	2,82,375	12,96,633	16,638	13,450
Jullundur - - -	29·8	Rabi - - -	10,93,359	1,81,080	9,12,276		
		Kharif - - -	7,92,131	1,59,080	6,33,051		
		Total - - -	18,85,490	3,40,160	15,45,330	52,280	74,702
Amritsar - -	23·1	Rabi - - -	12,27,139	4,32,443	7,94,696		
		Kharif - - -	6,12,524	2,69,233	3,43,291		
		Total - -	18,39,663	7,01,676	11,37,987	2,24,493	1,11,239
Lahore - -	18·5	Rabi - - -	12,01,627	6,17,957	5,83,670		
		Kharif - - -	7,93,771	2,61,143	5,32,628		
		Total - - -	19,95,398	8,79,100	11,16,298	1,72,186	1,46,394

(Continued.)

ing results. In the Mooltan division, which has the smallest rain-fall, of 4½ lakhs acres of food crops which are not irrigated nearly the whole is aided by river sailab. In the Derajat division, where the rain-fall is almost as small, of 10¼ lakhs unirrigated, nearly one-fourth is sailab; of the remaining three-fourths probably at least half is aided by floods from the Sulaiman range, and the balance is most of it situate in the Bannu district at the north end of the division, where the rain-fall is much above the average of the division.* In the Hissar division, with only 17 inches of rain-fall, the entire cultivation, nearly 3 millions of acres (the proportion irrigated is insignificant), is dependent on rain; and though 3½ lakhs of acres are said to be aided by sailab, the majority is in the Hissar district, where the aid so described is far less certain than on the Punjab rivers. In the remaining divisions the rain-fall is as a rule abundant; but making allowances for those tracts in each division where the contrary is the case, say 3 millions of acres,† and adding that to the area similarly circumstanced in the Hissar division, the cultivation of food grains in the province may be classified for the purposes of the question under reply as follows:—

	Millions of Acres.	
Irrigated - - -	4½	
Not irrigated, in 3 classes,—		
1. Sailab, *i.e.*, usually safe owing to aid received from river floods and percolation -	1½	14
2. Safe, because grown under an abundant and reliable rain-fall - - -	6½	
3. Dependent on a less certain rain-fall - - -	6	
Total - -	18½	

The proportion of the whole supply of food grains which is produced on irrigated land is a question of some difficulty; for this reason that, as noticed in the reply to Question 3, the annual estimates of crop-areas and yield are given in the gross for each district, and do not distinguish the areas and yield of crops under irrigation from that of land not so advantaged. District officers have been asked to state broadly in what ratio the produce (food grains) of 1 acre of irrigated land stands to that of 1 acre of unirrigated. The reply for the whole province is as 3 to 2. Therefore 18½ millions of acres being the average annual area of food grains, and of this 4½ millions being irrigated, it follows that of the total yield one-third is supplied from the irrigated lands and two-thirds from the unirrigated. The figures for each division calculated on the same principle are—

Division.	Rain-fall.	Per cent. of Area under Food Grains which is Irrigated.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land stand to that of 1 Acre of Unirrigated in an Average Year.	Of the Average Annual Yield of Food Grains what Per-centage is raised on Irrigated Land.	Remarks.
Delhi - - - - -	25·5	29	5 to 3	41	
Hissar - - - - -	16·9	6	2 to 1	11	
Umballa - - - - -	35·3	18	3 to 2	25	
Jullundur - - - -	29·8	18	3 to 2	25	
Amritsar - - - -	23·1	38	2 to 1	55	
Lahore - - - -	18·5	44	3 to 2	54	
Rawalpindi - -	*31·5	10	3 to 2	14	* A considerable portion of the division has smaller rain-fall.
Mooltan - - - - -	6·1	65	3 to 2	74	
Derajat - - - -	8·0	27	3 to 2	36	
Pesháwar - - - -	12·9	22	2 to 1	36	
Total -	—	25	3 to 2	33	

Division.	Rain-fall.	Harvest.	Area of Food Grains.			Sailab Area.	Area Irrigated which is not Cultivated with Food Crops.
			Total.	Of which Irrigated.	Balance Unirrigated including Sailab.		
Rawalpindi - -	31·5	Rabi - - -	14,64,572	1,60,874	13,03,698		
		Kharif - - -	9,97,773	77,571	9,20,202		
		Total - -	24,62,345	2,38,445	22,23,900	1,42,778	77,589
ooltan - - -	6·1	Rabi - - -	10,34,443	6,12,298	4,22,145		
		Kharif - - -	2,67,991	2,33,853	34,138		
		Total - -	13,02,434	8,46,151	4,56,283	3,75,619	2,88,379
Derajat - - -	8·0	Rabi - - -	8,47,121	2,59,124	5,87,997		
		Kharif - - -	5,70,426	1,17,358	4,53,068		
		Total - -	14,17,547	3,76,482	10,41,065	2,63,093	91,310
Peshávar - -	12·9	Rabi - - -	7,89,386	1,19,087	6,40,299		
		Kharif - - -	4,11,487	1,34,914	2,76,573		
		Total - -	11,70,873	2,54,001	9,16,872	22,153	44,303
Grand Total -	26·2	Rabi - - -	99,66,429	29,77,408	69,89,021		
		Kharif - - -	85,53,417	16,50,441	69,02,976		
		Total - -	1,85,19,846	46,27,849	1,38,91,997	16,35,350	10,07,937

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* Owing to an error which has occurred in the return of the Dera Ismail Khan district, and which was discovered too late for correction, the unirrigated area in this division is considerably over-estimated.

† Delhi division, 700,000 acres. Umballa division, 300,000 acres. Lahore division, 700,000 acres. Rawalpindi division, 1,000,000 acres. Peshávar division, 300,000 acres.

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The following table gives the same data for each district :—

Division.	District.	Rain-fall at Head Quarters.	Per cent. of Area under Food Grains which is Irrigated.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land stand to that of 1 acre of Unirrigated Land in an Average Year.	Of the Average Annual Yield of Food Grains what Percentage is raised on Irrigated Land.
Delhi -	Delhi - -	25·5	29	5 to 3	41
	Gurgaon -	28·5	18	5 to 3	27
	Karnál -	30·4	49	2 to 1	66
Hissar -	Hissar -	16·9	14	3 to 2	6
	Rohtak -	19·2	13	2 to 1	20
	Sirsa - -	14·3	9	2 to 1	6
Umballa -	Umballa -	35·3	17	3 to 2	26
	Ludhiána -	25·3	1	2 to 1	29
	Simla - -	65·1	7	3 to 2	10
Jullundur	Jullundur -	29·8	27	3 to 2	36
	Hoshiárpur	33·7	3	3 to 2	4
	Kángra -	125·6	29	2 to 1	45
Amritsar -	Amritsar -	23·1	36	2 to 1	53
	Siálkot -	39·0	57	3 to 2	67
	Gurdaspur -	30·9	18	2 to 1	31
Lahore -	Lahore -	18·5	68	3 to 2	76
	Ferozepore	20·0	18	5 to 3	27
	Gujránwála	26·3	69	3 to 2	77
Rawalpindi	Rawalpindi	31·5	2	2 to 1	4
	Jhelum -	18·6	3	3 to 2	4
	Gujrat -	29·2	14	3 to 2	20
	Shahpur -	13·0	38	3 to 2	48
Mooltan -	Mooltan -	6·1	73	2 to 1	84
	Jhang -	10·3	64	3 to 2	73
	Montgomery	8·7	63	4 to 3	69
	Muzaffargarh	6·1	57	3 to 2	67
Derajat -	D. I. Khan	8·0	19	5 to 4	23
	D. G. Khan	7·2	65	3 to 2	74
	Bannu -	12·0	13	2 to 1	23
Pesháwar	Pesháwar -	12·9	27	2 to 1	43
	Kohát -	20·2	17	3 to 1	38
	Hazára -	46·3	13	3 to 2	18

We may carry the question further on the same principle as that applied to the areas, and inquire what proportion of the total produce of unirrigated land is fairly secure, and what proportion depends on a precarious fall. The abundance of the rain-fall in the submontane tracts, and assistance by river sailab or hill floods in other places, will be admitted to have an effect on the yield as compared with that of unirrigated land less advantaged, not dissimilar to the advantage enjoyed by irrigated over unirrigated land.

There is nothing more certain and noteworthy, or more clearly shown by such produce statistics as we possess, than the great difference in yield between the better and worse classes of unirrigated land. But as the classification necessarily adopted is a very broad one, it will be safer not to assume the difference applicable thereto as greater than 3 to 2. The estimate of the extent to which the total yield of food grains in the province is secured against drought will then stand as follows :—

Classification of Cultivation.	Area cultivated, Millions of Acres.	Proportionate Rate of Yield.	Per-centage of Total Yield of Food Grains contributed by each Class.	Total Yield in Maunds (Millions).	Maunds per Acre.
Irrigated land - - - - - -	4½	4·5	36	54	12
Not irrigated, but aided by sailab or floods, or protected by abundant rain-fall.	8	3	43	64	8
Not irrigated, and dependent on a smaller and more precarious rain-fall.	6	2	21	31	5
Total - - - -	18½	—	100	149	8·05

NOTE.—The third column of this statement is arrived at thus:—

4½ × 4·5 = 20¼
8 × 3 = 24
6 × 2 = 12

Total - 56¼

Then 56¼ : 20¼ : : 100 : 36, and similarly for the other two items.

To how much of the area is the protection complete and permanent, and how much is dependent on the local rain? Supposing canals, tanks, wells, [and jhils to be utilised to the utmost extent, and kept in the highest possible order, what extent of the country would be protected from drought in a year when there is a failure of rain?

I am not certain in what sense the term "*protected by irrigation*" is used in this question. In the previous portion of this reply I have answered as if it was equivalent to the term "*irrigated.*" In the Irrigation Department a tract is said to be "protected by irrigation" of which a third part is or can be irrigated in a season of drought by a canal drawn from a permanent river or by wells not liable to dry up.

I shall avoid technicalities of this nature, and confine myself to the actual area irrigated. In the whole

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Punjab this is 26 per cent. of the cultivation, or 5½ million acres out of 21 millions. The details of the irrigation are roughly—

	Millions of Acres.	Per cent. of Irrigation.
By wells - - -	3	55
By inundation canals - -	1	18
By perennial canals - -	¾	14
By small channels and streams -	⅝	11
By tanks and jhils, less than -	⅛	2
Total - -	5½	100

The complete figures for each division are given in a foot-note below.*

As regards the well irrigation, it will be seen from that foot-note that the greater part of this is situate in submontane districts with a reliable rain-fall. In the Mooltan division, where the contrary is the case, the wells are largely aided by canals or by river sailab. Well cultivation may be said broadly to be never independent of aid by rain or by other means. It is not an absolute insurance against famine—it is only an insurance against its milder forms. In the reply to Question 2 it has been shown that famine is commonly caused by the failure of the kharif harvest followed by the failure of the rabi sowings. A little reflection will show the effect of this upon wells. The well cattle depend for their winter fodder largely on the kharif harvest. All aid from rain failing, they are thrown for support entirely on the produce of the water raised by their labour. At the same time, the winter rains failing, that labour becomes unusually continuous and severe. On the other hand it becomes a question of increasing perplexity to the well owner how he is to feed both his cattle and his own family. There is also this additional trouble, that the drought has made both air and soil so dry that the water does far less irrigating duty than usual. In the end, if the drought really lasts a year; that is to say, if it comes in with the failure of the kharif, and is followed by a similar failure of the winter rains, it is perfectly certain that a vast number of the well cattle will have died of hunger and fatigue before the next autumn rains are due, and that the area before irrigated by the wells will have greatly contracted wherever not aided by canal irrigation. The eventual breaking down of the wells under such circumstances is merely a question of time. In short, the main defect of well irrigation in its relation to famine is, that it depends on animal power, requiring for its support large quantities of fodder. In ordinary years it adds greatly to the agricultural wealth of the country. In bad seasons not amounting to famine it is the saving of the tracts where it exists. In prolonged famine its breaking down is mainly a question of time; at any rate the food supplied by such well irrigation as survived would bear no proportion to that raised on the well irrigated lands in the previous prosperous seasons.

Canal irrigation possesses no similar drawback. It can be absolutely depended upon in the worst famines; and by far the greater portion of it being by flow, and not by lift, it is applied to the land with little or no expenditure of labour. The heads of the inundation canals are no doubt less to be depended on than those of the perennial canals; but as a matter of experience the irrigation from the inundation canals, when superintended by properly trained canal officers, has proved to be fairly certain; and with the increasing attention paid to them it is likely to prove still more reliable in the future.

The irrigation from the small channels and streams is in most instances certain and reliable; as also that from our great perennial canals, the Bari Doáb and Western Jumna.

It remains to explain what would be the probable effect of a year of drought in expanding or contracting the area irrigated from these three classes of canals. The volume of the rivers from which their supply is drawn would be affected, but not materially so, for these rivers have their sources in the glaciers of the Himalayas. The drought reduces the duty which the water is capable of doing; the dryness of the atmosphere increases the rate of evaporation; the soil is more thirsty; and owing to the absence of rain a greater number of waterings is required by each crop. On the other hand everyone has the strongest motives for making the water go as far as possible; so the waste due to carelessness of application in ordinary years is saved. And our canal administration can be depended on to make unusual exertions to send the largest possible amount of water into the canals and to distribute it in the best way.

The following figures of the Western Jumna canal, a canal that irrigates tracts where famine is most felt in this province, furnish remarkable evidence of the stability and elasticity of canal irrigation under the pressure of famine:—

Year.	Acres irrigated.	Remarks.
1822–3 - - -	30,749	
1823–4 - - -	51,609	Drought.
1824–5 - - -	88,185	Famine.
1825–6 - - -	69,320	
1832–3 - - -	94,299	
1833–4 - - -	2,13,206	Famine.
1836–7 - - -	2,19,503	
1837–8 - - -	3,90,318	Drought.
1860–1 - - -	4,54,292	Famine.
1861–2 - - -	3,72,680	
1867–8 - - -	3,31,037	
1868–9 - - -	4,86,876	Famine.
1876–7 - - -	3,66,482	
1877–8 - - -	5,07,974	Scarcity.

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* Details of Punjab irrigation, abstracted from the more complete statement appended to this reply.

Division.	Rain-fall.	Per cent. of Cultivated Area Irrigated.	Detail of Irrigation.						Average Area of Unirrigated Crops.
			Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	
Delhi - -	25·5	32	2,24,717	—	2,96,939	98,327	30,993	6,50,976	14,63,350
Hissar - -	16·9	7	1,58,670	—	32,919	—	27,465	2,19,054	29,98,218
Umballa - -	35·3	14	3,490	—	1,80,497	25,612	86,226	2,95,825	14,65,906
Jullundur -	29·8	21	5,619	—	2,43,649	515	1,65,079	4,14,862	17,42,591
Amritsar - -	23·1	35	1,71,530	—	6,13,200	10,722	17,463	8,12,915	13,53,491
Lahore - -	18·5	40	1,40,432	62,967	8,10,939	7,502	3,654	10,25,494	12,87,677
Rawalpindi -	31·5	20	—	52,000	2,54,276	—	9,758	3,16,034	25,22,069
Mooltan - -	6·1	69	—	6,02,403	5,24,297	—	7,830	11,34,530	5,09,335
Derajat - -	8·0	35	—	2,16,574	1,85,218	—	66,000	4,67,792	11,59,115
Pesháwar - -	12·9	24	35,187	—	34,140	558	2,28,419	2,98,304	9,74,918
Total -	—	26	7,39,645	9,33,944	31,76,074	1,43,236	6,42,887	56,35,786	1,54,76,670

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And I would point out, as not the least valuable point in the above figures, that the increased irrigation attained under the pressure of each famine year is always maintained after the famine has passed away. I cannot give similar figures for the other canals. The tracts watered by the Bari Doáb canal have not suffered by famine since it was opened. And the inundation canals flow in a country where, but for them, there would be no cultivation.

To resume. The well irrigation, 3 millions of acres, would certainly contract greatly under pressure of drought. But it is for the most part situate in submontane tracts, where a complete failure of rain-fall is unusual. That of the Mooltan Division is mostly aided by canals or sailab. The canal irrigation, 2⅛ millions of acres, on the other hand, would not contract in a year of drought; but on the best managed canals would probably extend. The small area irrigated from tanks and jhils, 1,40,000 acres, would contract very largely.

In conclusion, before leaving this question, the Financial Commissioner desires to bring to the attention of Government the urgency of developing kharíf irrigation from the Western Jumna canal in the dry tracts of the Delhi and Hissar Divisions. The reply to Question 2 has shown that, whenever bad years come, it is in this part of the province that they are most severely felt. In the Hissar Division, of a cultivated area of 3 millions of acres, little more than 2,00,000 are irrigated. A scheme is now pending the sanction of Government whereby kharíf irrigation will be supplied from the Western Jumna canal to 25,000 acres in the Karnál District, and 32,000 acres in the Rohtak District, of which the cost is small and the difficulties of execution *nil*. But a much more important scheme was set aside about the year 1871, on reference to the Secretary of State, whereby a kharíf irrigation branch would have been taken out from the main line of the Western Jumna canal above Karnál, and have been carried into the eastern portion of the Sirsa District. This branch would water from 1,50,000 to 2,00,000 acres in the most famine-stricken tract in the Punjab. The scheme would cost 20 lakhs, and would probably yield an annual gross revenue of from 3 to 4 lakhs.* It has hitherto been set aside because it was inconvenient to provide the money, and because other works were in progress on the Western Jumna canal. But judging by the results of the famines of 1860-61 and 1868-69, and of the late scarcity in 1877-78, it is probable that no canal extension can be either more urgent or more profitable than this. If this scheme is carried out, and if a further extension of irrigation in the western end of the Sirsa District can be obtained by means of the Abohar branch of the Sirhind canal, very important progress will have been made towards protecting the Hissar Division from famine.

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* These data have been obtained from the Irrigation Department.

What is the effect of the irrigation of crops other than food crops in adding to the powers of the population to resist famine?

It has been stated above that of 5½ millions of acres irrigated all but one million is devoted to the cultivation of food grains. I propose to answer this question by giving such information as is available concerning the crops of which this one million not devoted to food grains is made up. This can be done mainly by the aid of the crops statement appended to Question 3. We know that the entire crop of indigo and nearly all the sugar-cane is irrigated; the same is true of poppy, tobacco, turmeric, coriander seed, ginger, and chillies. Of vegetables also the major portion is cultivated on irrigated land. And the annual cotton report for 1876-77 shows that of the cotton crop more than 3,50,000 acres are irrigated. These items added together total—

	Acres.
Indigo - - -	101,650
Sugar-cane - - -	356,142
Cotton - - -	350,000
Vegetables (say half the area returned) - -	132,500
Poppy - - -	11,042
Tobacco - - -	71,698
Turmeric - - -	3,508
Coriander seed, ginger, and chillies - - -	23,743
Total - - -	1,050,283

If we omit indigo and poppy, there is not one of these crops which is not as necessary to the sustenance of the people as the ordinary food grains. The area under the valuable crops of indigo and poppy is insignificant compared with the total area (5½ millions) irrigated. Moreover, cotton excepted, of which the cultivation is easy, we may say that these crops represent the efforts of the best cultivators of the province. And they are far more profitable than the ordinary food crops.

Statement showing for each District in the Punjab the Extent to which each District is Protected by Irrigation, and the Proportion of that Area devoted to Food Crops; the Ratio by which Irrigation increases the Yield of Land; and the Proportion of the Total Yield of Food Grains due to Irrigation; also Area still Uncultivated, and Total Population.

Prefatory Remarks.—In the cultivated area double crop lands are reckoned twice, so that the acreage given is the gross acreage of the annual crops.

Columns 12 to 21 have been filled in from the replies received from District Officers. In columns 22-27 the total areas are the same as those given in the statement of crops appended to the reply to Question 3; the irrigated areas are copied from columns 12 to 21 of this statement; and the unirrigated areas are the difference.

The total areas given in columns 21 and 27 disagree by the amount stated in column 28. The total difference between these columns for the whole province is 2½ per cent.; in all but eight Districts the two columns agree approximately; and were a little more time at my disposal, it would be easy to eliminate the discrepancies by reference to district officers. But the total difference being only 2½ per cent., it seems scarcely worth while to do so, more especially as from the manner in which the irrigated areas in columns 22-27 have been reckoned, it is certain that the irrigated areas have not been overestimated.

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PUNJAB.

Major Wace.

STATEMENT showing for each DISTRICT in the PUNJAB the EXTENT to which CULTIVATION is protected by IRRIGATION, and the PROPORTION of that AREA devoted to FOOD CROPS; the RATIO by which IRRIGATION increases the YIELD of LAND; and the PROPORTION of the TOTAL YIELD of FOOD GRAINS due to IRRIGATION; also AREA still UNCULTIVATED, and TOTAL POPULATION.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
			Per Square Mile of									AVERAGE ACREAGE OF CROPS.										Food Grains.								
												Irrigated by																		
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
DELHI.	Delhi - -	608,850	634	2,009	25·5	69	37	2	61	817,819	Food Grains and Pulses. Rabi -	39,616	—	35,634	9,328	—	84,578				Irrigated -	84,578	64,113	148,691	45,174	193,865				
											Kharif	31,133	—	28,261	4,719	—	64,113				Unirrigated	182,408	174,304	356,712	24,247	380,959				
											Total	70,749	—	63,895	14,047	—	148,691				Total -	266,986	238,417	505,403	69,421	574,824	+ 56,362	5 to 3	29	41
											Other Produce -	24,597	—	13,603	6,974	—	45,174													
											Total -	95,346	—	77,498	21,021	—	193,865	8,000	316,597	518,462										
	Gurgaon -	697,341	381	2,340	28·5	31	19	—	81	1,267,335	Food Grains and Pulses. Rabi -	12,867	—	78,086	45,182	—	136,135				Irrigated -	136,135	30,540	166,675	24,071	190,746				
											Kharif	5,174	—	8,933	16,433	—	30,540				Unirrigated	198,707	567,951	766,658	65,383	832,041				
											Total	18,041	—	87,019	61,615	—	166,675				Total -	334,842	598,421	933,333	89,454	1,022,787	+ 33,309	5 to 3	18	27
											Other Produce -	4,015	—	5,286	14,770	—	24,071													
											Total -	22,056	—	92,805	76,385	—	190,746	2,000	796,732	989,478										
	Karnál - -	610,927	482	1,468	30·4	132	39	1	60	1,505,171	Food Grains and Pulses. Rabi -	44,428	—	74,344	671	19,619	139,062				Irrigated -	189,062	87,197	226,259	40,106	266,365				
											Kharif	40,743	—	35,787	193	10,474	87,197				Unirrigated	88,775	142,226	231,001	19,349	250,350				
											Total	85,171	—	110,131	864	30,093	226,259				Total -	227,337	229,423	457,260	59,455	516,715	−167,294	2 to 1	49	66
											Other Produce -	22,144	—	17,005	57	900	40,106													
											Total -	107,315	—	127,136	921	30,993	266,365	3,500	414,144	684,009										

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Punjab.

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		Population by Census of 1868.				Per-centages on Cultivation.					Detail of Cultivated Area (in Acres) showing Source of Irrigation.										Distribution of Irrigation between Food Grains and other Crops.									
			Per Square Mile of								Average Acreage of Crops.											Food Grains.								
												Irrigated by																		
Division.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
HISSAR.	Hissar - -	484,681	242	4,406	16·9	77	5	23	72	2,265,428	Food Grains and Pulses. Rabi -	31,890	—	863	—	4,320	37,073				Irrigated -	37,073	19,486	56,559	13,612	70,171				
											Kharif	18,564	—	122	—	800	19,486				Unirrigated	102,637	1,208,358	1,310,995	51,804	1,362,799				
											Total	50,454	—	985	—	5,120	56,559				Total -	139,710	1,227,844	1,367,554	65,416	1,432,970	+ 150,418	3 to 2	4	6
											Other Produce -	12,174	—	438	—	1,000	13,612													
											Total -	62,628	—	1,423	—	6,120	70,171	291,694	921,287	1,282,552										
	Rohtak -	536,914	574	2,902	19·2	28	13	1	86	1,158,988	Food Grains and Pulses. Rabi -	44,509	—	13,144	—	—	57,743				Irrigated -	57,743	23,283	81,026	37,338	118,364				
											Kharif	23,012	—	271	—	—	23,283				Unirrigated	254,861	389,316	644,177	78,460	722,637				
											Total	67,611	—	13,415	—	—	81,026				Total -	312,604	412,599	725,203	115,798	841,001	− 77,764	2 to 1	11	20
											Other Produce -	28,431	—	8,907	—	—	37,338													
											Total -	96,042	—	22,322	—	—	118,364	9,700	790,701	918,765										
	Sirsa - -	210,795	140	4,392	14·3	107	3	5	92	1,997,327	Food Grains and Pulses. Rabi -	—	—	6,828	—	16,566	23,394				Irrigated -	23,394	6,855	30,249	270	30,519				
											Kharif	—	—	2,076	—	4,779	6,855				Unirrigated	134,432	713,654	848,086	64,696	912,782				
											Total	—	—	8,904	—	21,345	30,249				Total -	157,826	720,509	878,335	64,966	943,301	− 21,354	2 to 1	3	6
											Other Produce -	—	—	270	—	—	270													
											Total -	—	—	9,174	—	21,345	30,519	51,816	882,420	964,755										

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PUNJAB.

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued*.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22	23.	24.	25.	26.	27.	28.	29.	30.	31.
Division.	District.	Population by Census of 1868.			Average Annual Rain-fall.	Per-centages on Cultivation.				Total Area in Acres.	Detail of Cultivated Area (in Acres) showing Source of Irrigation.										Distribution of Irrigation between Food Grains and other Crops.							In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
			Per Square Mile of								Average Acreage of Crops.											Food Grains.								
												Irrigated by																		
		Total Souls.	Total Cultivation.	Irrigation.		Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.		—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.			
UMBALLA.	Umballa	1,035,488	695	3,765	35·3	88	18	1	81	1,677,337	Food Grains and Pulses. Rabi	1,305	—	32,768	5,200	14,563	53,836				Irrigated	53,836	117,733	171,569	4,307	175,876				
											Kharif	2,185	—	24,100	20,412	71,036	117,733				Unirrigated	436,618	304,370	740,988	110,543	851,531				
											Total	3,490	—	56,868	25,612	85,599	171,569				Total	490,454	422,103	912,557	114,850	1,027,407	+ 74,347	3 to 2	19	26
											Other Produce	—	—	4,307	—	—	4,307													
											Total	3,490	—	61,175	25,612	85,599	175,876	10,000	767,184	953,060										
	Ludhiána	583,245	521	3,136	25·3	28	17	1	82	875,761	Food Grains and Pulses. Rabi	—	—	62,115	—	—	62,115				Irrigated	62,115	48,082	110,197	9,125	119,322				
											Kharif	—	—	48,082	—	—	48,082				Unirrigated	342,051	205,991	548,042	57,770	605,812				
											Total	—	—	110,197	—	—	110,197				Total	404,166	254,073	658,239	66,895	725,134	+ 9,652	2 to 1	17	29
											Other Produce	—	—	9,125	—	—	9,125													
											Total	—	—	119,322	—	—	119,322	6,638	589,522	715,482										
	Simla	33,995	1,999	33,995	65·1	9	6	—	94	11,520	Food Grains and Pulses. Rabi	—	—	—	—	609	609				Irrigated	609	—	609	18	627				
											Kharif	—	—	—	—	—	—				Unirrigated	3,748	3,855	7,603	960	8,563				
											Total	—	—	—	—	609	609				Total	4,357	3,855	8,212	978	9,190	— 1,912	3 to 2	7	10
											Other Produce	—	—	—	—	18	18													
											Total	—	—	—	—	627	627	—	10,475	11,102										

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Major Wace.

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
			Per Square Mile of									AVERAGE ACREAGE OF CROPS.										Food Grains.								
												Irrigated by																		
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
JULLUNDUR.	Jullundur	794,764	758	2,271	29·8	39	33	4	63	848,825	Food Grains and Pulses. Rabi	—	—	111,574	—	—	111,574				Irrigated	111,574	68,607	180,181	43,998	224,179				
											Kharif	—	—	68,607	—	—	68,607				Unirrigated	267,894	227,946	495,840	57,373	553,213				
											Total	—	—	180,181	—	—	180,181				Total	379,468	296,553	676,021	101,371	777,392	+ 106,883	3 to 2	27	36
											Other Produce	—	—	43,998	—	—	43,998													
											Total	—	—	224,179	—	—	224,179	27,280	419,050	670,509										
	Hoshiárpur	938,930	726	22,901	33·7	77	3	3	94	1,335,523	Food Grains and Pulses. Rabi	3,532	—	10,412	387	375	14,706				Irrigated	14,706	8,274	22,980	3,305	26,285				
											Kharif	1,887	—	5,985	128	274	8,274				Unirrigated	429,785	276,585	706,370	118,215	824,585				
											Total	5,419	—	16,397	515	649	22,980				Total	444,491	284,859	729,350	121,520	850,870	+ 23,539	3 to 2	3	4
											Other Produce	200	—	3,073	—	32	3,305													
											Total	5,619	—	19,470	515	681	26,285	25,000	776,056	827,341										
	Kángra	743,882	790	2,894	125·6	188	27	—	73	1,583,410	Food Grains and Pulses. Rabi	—	—	—	—	54,800	54,800				Irrigated	54,800	82,199	136,999	27,399	164,398				
											Kharif	—	—	—	—	82,199	82,199				Unirrigated	214,600	128,520	343,120	21,673	364,793				
											Total	—	—	—	—	136,999	136,999				Total	269,400	210,719	480,119	49,072	529,191	− 73,374	2 to 1	29	45
											Other Produce	—	—	—	—	27,399	27,399													
											Total	—	—	—	—	164,398	164,398	—	438,167	602,565										

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Punjab.

Major Wace.

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.		13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
Division.	District.	Population by Census of 1868:			Average Annual Rain-fall.	Per-centages on Cultivation.				Total Area in Acres.	Detail of Cultivated Area (in Acres) showing Source of Irrigation.											Distribution of Irrigation between Food Grains and other Crops.							In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
		Total Souls.	Per Square Mile of			Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.		Average Acreage of Crops.											—	Food Grains.			Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.			
			Total Cultivation.	Irrigation.							—		Irrigated by						Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.		Spring.	Autumn.	Total.						
													Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.													
AMRITSAR.	Amritsar	1,083,591	1,018	2,623	23·1	57	39	3	58	999,680	Food Grains and Pulses.	Rabi	53,203	—	85,018	27	13	138,261				Irrigated	138,261	69,130	207,391	57,279	264,670				
												Kharif	26,602	—	42,508	13	7	69,130				Unirrigated	254,003	115,817	369,820	48,251	418,071				
												Total	79,805	—	127,526	40	20	207,391				Total	392,264	184,947	577,211	105,530	682,741	+ 1,821	2 to 1	36	53
											Other Produce		28,200	—	29,079	—	—	57,279													
											Total		108,005	—	156,605	40	20	264,670	22,154	394,096	680,920										
	Sialkot	1,005,005	758	1,511	39·0	54	50	10	40	1,251,551	Food Grains and Pulses.	Rabi	—	—	240,115	3,005	3,050	246,170				Irrigated	246,170	140,071	386,241	39,404	425,645				
												Kharif	—	—	121,474	4,877	13,720	140,071				Unirrigated	215,166	76,856	292,022	85,960	377,982				
												Total	—	—	361,589	7,882	16,770	386,241				Total	461,336	216,927	678,263	125,364	803,627	− 44,294	3 to 2	57	67
											Other Produce		—	—	39,154	—	250	39,404													
											Total		—	—	400,743	7,882	17,020	425,645	84,404	337,872	847,921										
	Gurdáspur	655,262	540	3,413	30·9	53	16	15	69	1,163,589	Food Grains and Pulses.	Rabi	14,915	—	31,527	1,385	185	48,012				Irrigated	48,012	60,032	108,044	14,556	122,600				
												Kharif	40,850	—	18,281	736	165	60,032				Unirrigated	325,527	150,618	476,145	81,293	557,438				
												Total	55,765	—	49,808	2,121	350	108,044				Total	373,539	210,650	584,189	95,849	680,038	− 83,619	2 to 1	18	31
											Other Produce		7,760	—	6,044	679	73	14,556													
											Total		63,525	—	55,852	2,800	423	122,600	117,935	523,122	763,657										

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										
			Per Square Mile of										AVERAGE ACREAGE OF CROPS.								
													Irrigated by								
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—		Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.
LAHORE.	Lahore -	789,666	411	1,111	18·5	94	37	9	54	2,341,439	Food Grains and Pulses.	Rabi -	90,765	16,611	169,967	—	—	277,343			
												Kharif	36,067	2,000	101,594	—	—	139,661			
												Total	126,832	18,611	271,561	—	—	417,004			
											Other Produce -		13,600	2,887	21,649	—	—	38,136			
											Total -		140,432	21,498	293,210	—	—	455,140	106,089	667,439	1,228,668
	Ferozepore -	549,251	276	1,941	20·0	40	14	3	83	1,753,250	Food Grains and Pulses.	Rabi -	—	21,543	86,434	—	—	107,977			
												Kharif	—	18,513	47,782	—	—	66,295			
												Total	—	40,056	134,216	—	—	174,272			
											Other Produce -		—	1,413	5,226	—	—	6,638			
											Total -		—	41,469	139,442	—	—	180,910	42,983	1,051,084	1,274,978
	Gujránwála -	550,676	637	904	26·3	203	70	4	26	1,640,223	Food Grains and Pulses.	Rabi -	—	—	232,227	—	410	232,637			
												Kharif	—	—	44,475	7,502	3,210	55,187			
												Total	—	—	276,702	7,502	3,620	287,824			
											Other Produce -		—	—	101,585	—	34	101,619			
											Total -		—	—	378,287	7,502	3,654	389,443	23,114	140,925	553,482

2.	22.	23.	24.	25.	26.	27.	28.	20.	30.	31.
	DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
		Food Grains.								
District.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
Lahore	Irrigated -	277,343	139,661	417,004	38,136	455,140				
	Unirrigated	189,228	60,637	199,865	60,371	260,236				
	Total -	466,571	200,298	616,869	98,507	715,376	−513,292	3 to 2	68	76
Ferozepore	Irrigated -	107,977	66,295	174,272	6,638	180,910				
	Unirrigated	408,911	377,251	786,162	80,837	866,999				
	Total -	516,888	443,546	960,434	87,475	1,047,909	−227,069	5 to 3	18	27
Gujránwála	Irrigated -	232,637	55,187	287,824	101,619	389,443				
	Unirrigated	35,531	94,740	130,271	30,172	160,443				
	Total -	268,168	149,927	418,095	131,791	549,886	− 3,596	3 to 2	69	77

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
		Population by Census of 1868.				Per-centages on Cultivation.					Detail of Cultivated Area (in Acres) showing Source of Irrigation.									
			Per Square Mile of									Average Acreage of Crops.								
												Irrigated by								
Division.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.
RAWALPINDI.	Rawalpindi	711,256	546	28,450	31·5	379	2	—	98	3,979,697	Food Grains and Pulses. Rabi	—	—	13,361	—	1,231	14,592			
											Kharif	—	—	—	—	—	—			
											Total	—	—	13,361	—	1,231	14,592			
											Other Produce	—	—	1,440	—	125	1,565			
											Total	—	—	14,801	—	1,356	16,157	725	817,110	833,992
	Jhelum	500,988	348	10,224	18·6	173	3	3	94	2,502,400	Food Grains and Pulses. Rabi	—	—	14,893	—	1,015	15,908			
											Kharif	—	—	10,034	—	1,015	11,049			
											Total	—	—	24,927	—	2,030	26,957			
											Other Produce	—	—	4,593	—	99	4,692			
											Total	—	—	29,520	—	2,129	31,649	26,394	863,671	921,714
	Gujrat	616,347	560	4,280	29·2	84	13	9	78	1,298,560	Food Grains and Pulses. Rabi	—	—	53,934	—	3,785	57,719			
											Kharif	—	—	28,704	—	1,478	30,182			
											Total	—	—	82,638	—	5,263	87,901			
											Other Produce	—	—	3,622	—	618	4,240			
											Total	—	—	86,260	—	5,881	92,141	64,738	547,548	704,427

1.	2.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		Distribution of Irrigation between Food Grains and other Crops.									
			Food Grains.								
Division.	District.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
RAWALPINDI.	Rawalpindi	Irrigated	14,592	—	14,592	1,565	16,157				
		Unirrigated	441,479	333,535	775,014	112,284	887,298				
		Total	456,071	333,535	789,606	113,849	903,455	+69,463	2 to 1	2	4
	Jhelum	Irrigated	15,903	11,049	26,957	4,692	31,649				
		Unirrigated	463,035	287,386	750,421	81,257	831,678				
		Total	478,913	298,435	777,378	85,949	863,327	−58,387	3 to 2	3	4
	Gujrat	Irrigated	57,719	30,182	87,901	4,240	92,141				
		Unirrigated	288,667	228,961	517,628	123,916	641,544				
		Total	346,386	259,143	605,529	128,156	733,685	+29,258	3 to 2	14	20

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
			Per Square Mile of								AVERAGE ACREAGE OF CROPS.											Food Grains.								
												Irrigated by																		
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
RAWALPINDI.	Shahpur	368,766	857	1,341	13·0	995	64	19	17	3,007,607	Food Grains and Pulses. Rabi -	—	13,000	59,455	—	200	72,655				Irrigated -	72,655	36,340	108,995	67,092	176,087				
											Kharif	—	14,000	22,240	—	100	36,340				Unirrigated	110,517	70,320	180,837	—	161,549				
											Total	—	27,000	81,695	—	300	108,995				Total -	183,172	106,660	289,832	47,804	337,636	+62,611	3 to 2	38	48
											Other Produce -	—	25,000	42,000	—	92	67,092													
											Total -	—	52,000	123,695	—	392	176,087	50,921	48,017	275,025										
MOOLTAN.	Mooltan	471,573	582	736	6·1	634	79	21	—	3,793,280	Food Grains and Pulses. Rabi -	—	164,787	27,024	—	—	191,811				Irrigated -	191,811	91,113	282,924	127,376	410,300				
											Kharif	—	78,913	10,600	—	1,600	91,113				Unirrigated	103,837	—	103,837	21,247	125,084				
											Total	—	243,700	37,624	—	1,600	282,924				Total -	295,648	91,113	386,761	148,623	535,384	+16,212	2 to 1	73	84
											Other Produce -	—	90,867	34,417	—	2,092	127,376													
											Total -	—	334,567	72,041	—	3,692	410,300	107,187	1,685	519,172										
	Jhang	348,027	681	980	10·3	1,020	69	30	1	3,649,551	Food Grains and Pulses. Rabi -	—	311	131,845	—	1,359	133,515				Irrigated -	133,515	36,575	170,090	57,014	227,104				
											Kharif	—	26	35,992	—	557	36,575				Unirrigated	73,057	21,020	94,077	4,748	98,825				
											Total	—	337	167,837	—	1,916	170,090				Total -	206,572	57,595	264,167	61,762	325,929	−823	3 to 2	64	73
											Other Produce -	—	30	56,436	—	548	57,014													
											Total -	—	367	224,273	—	2,464	227,104	96,581	3,067	326,752										

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
Division.	District.	Population by Census of 1868. Total Souls.	Population by Census of 1868. Per Square Mile of Total Cultivation.	Population by Census of 1868. Per Square Mile of Irrigation.	Average Annual Rain-fall.	Per-centages on Cultivation. Of Uncultivated Land.	Per-centages on Cultivation. Of Irrigated Cultivation.	Per-centages on Cultivation. Of Sailab Cultivation.	Per-centages on Cultivation. Of Cultivation dependent solely on Rain.	Total Area in Acres.	Detail of Cultivated Area (in Acres) showing Source of Irrigation. Average Acreage of Crops. —	Irrigated by Perennial Canals.	Irrigated by Autumnal Inundation Canals.	Irrigated by Wells.	Irrigated by Tanks and Jhils.	Irrigated by Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	Distribution of Irrigation between Food Grains and other Crops. —	Food Grains. Spring.	Food Grains. Autumn.	Food Grains. Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
MOOLTAN.	Montgomery	359,432	596	956	8·7	826	62	8	31	3,566,928	Food Grains and Pulses. Rabi -	—	30,226	133,699	—	1,365	165,290				Irrigated -	165,290	50,068	215,358	25,234	240,592				
											Kharif	—	22,600	27,159	—	309	50,068				Unirrigated	111,430	13,013	124,443	20,913	145,356				
											Total	—	52,826	160,858	—	1,674	215,358				Total -	276,720	63,081	339,801	46,147	385,948	—	4 to 3	63	69
											Other Produce -	—	5,562	19,672	—	—	25,234													
											Total -	—	58,388	180,530	—	1,674	240,592	30,856	114,500	385,948										
	Muzaffargarh	295,547	476	737	6·1	877	65	35	—	1,890,560	Food Grains and Pulses. Rabi -	—	103,650	18,032	—	—	121,682				Irrigated -	121,682	56,097	177,779	78,755	256,534				
											Kharif	—	48,979	7,118	—	—	56,097				Unirrigated	133,821	105	133,926	6,144	140,070				
											Total	—	152,629	25,150	—	—	177,779				Total -	255,503	56,202	311,705	84,899	396,604	−925	3 to 2	57	67
											Other Produce -	—	56,452	22,303	—	—	78,755													
											Total -	—	209,081	47,453	—	—	256,534	140,995	—	397,529										
DERAJAT.	Dera Ismail Khan.	394,864	547	1,687	8·0	883	32	35	33	4,541,800	Food Grains and Pulses. Rabi -	—	35,000	68,000	—	—	103,000				Irrigated -	103,000	27,000	130,000	20,000	150,000				
											Kharif	—	15,000	12,000	—	—	27,000				Unirrigated	268,275	269,187	537,462	101,316	638,778				
											Total	—	50,000	80,000	—	—	130,000				Total -	371,275	296,187	667,462	121,316	788,778	+326,778	5 to 4	19	23
											Other Produce -	—	10,000	10,000	—	—	20,000													
											Total -	—	60,000	90,000	—	—	150,000	160,000	152,000	462,000										

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
			Per Square Mile of								AVERAGE ACREAGE OF CROPS.											Food Grains.								
												Irrigated by																		
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
DERAJAT.	Dera Ghází Khan.	308,831	455	794	7·2	599	57	10	33	3,033,312	Food Grains and Pulses. Rabi -	—	37,203	80,321	—	—	117,524				Irrigated -	117,524	70,958	188,482	60,310	248,792				
											Kharif	—	69,958	1,000	—	—	70,958				Unirrigated	34,166	66,464	100,630	5,609	106,239				
											Total	—	107,161	81,321	—	—	188,482				Total -	151,690	137,422	289,112	65,919	355,031	−78,923	3 to 2	65	74
											Other Produce -	—	49,413	10,897	—	—	60,310													
											Total -	—	156,574	92,218	—	—	248,792	41,093	144,069	433,954										
	Bannu -	287,647	392	2,663	12·0	332	15	13	72	2,029,440	Food Grains and Pulses. Rabi -	—	—	1,600	—	37,000	38,600				Irrigated -	38,600	19,400	58,000	11,000	69,000				
											Kharif	—	—	400	—	19,000	19,400				Unirrigated	285,556	117,417	402,973	11,125	414,098				
											Total	—	—	2,000	—	56,000	58,000				Total -	324,156	136,817	460,973	22,125	483,098	+13,098	2 to 1	13	23
											Other Produce -	—	—	1,000	—	10,000	11,000													
											Total -	—	—	3,000	—	66,000	69,000	62,000	339,000	470,000										
PESHAWAR.	Pesháwar -	523,152	369	1,539	12·9	93	25	3	72	1,598,414	Food Grains and Pulses. Rabi -	—	—	9,705	370	72,501	82,576				Irrigated -	82,576	97,991	180,567	36,820	217,387				
											Kharif	—	—	12,119	130	85,742	97,991				Unirrigated	422,327	62,664	484,991	24,631	509,622				
											Total	—	—	21,824	500	158,243	180,567				Total -	504,903	160,655	665,558	61,451	727,009	−132,441	2 to 1	27	43
											Other Produce -	—	—	10,819	58	25,943	36,820													
											Total -	—	—	32,643	558	184,186	217,387	20,656	621,207	859,450										

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	24.	24.	25.	26.	27.	28.	29.	30.	31.
		POPULATION BY CENSUS OF 1868.				PER-CENTAGES OF CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.										DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
			Per Square Mile of								AVERAGE ACREAGE OF CROPS.											Food Grains.								
												Irrigated by																		
DIVISION.	District.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Salaib Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 21 or is less than Column 21.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
PESHAWAR.	Kohat	145,392	976	2,596	20·2	181	38	2	60	1,816,600	Food Grains and Pulses. Rabi	20,693	—	340	—	—	21,033				Irrigated	21,033	11,702	32,735	3,213	35,948				
											Kharif	11,345	—	357	—	—	11,702				Unirrigated	88,498	73,044	161,542	12,457	173,999				
											Total	32,038	—	697	—	—	32,735				Total	109,531	84,746	194,277	15,670	209,947	+114,641	3 to 1	17	38
											Other Produce	3,149	—	64	—	—	3,213													
											Total	35,187	—	761	—	—	35,948	1,497	57,861	95,306										
	Hazára	367,236	544	5,246	46·3	334	10	—	90	1,814,529	Food Grains and Pulses. Rabi	—	—	332	—	15,146	15,478				Irrigated	15,478	25,221	40,699	4,270	44,969				
											Kharif	—	—	404	—	24,817	25,221				Unirrigated	129,474	140,865	270,339	20,958	291,297				
											Total	—	—	736	—	39,963	40,699				Total	144,952	166,086	311,038	25,228	336,266	−95,458	3 to 2	13	18
											Other Produce	—	—	—	—	4,270	4,270													
											Total	—	—	736	—	44,233	44,969	—	386,755	431,724										

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
	POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.									
		Per Square Mile of								AVERAGE ACREAGE OF CROPS.									
											Irrigated by								
DIVISION.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.
										DIVISIONAL TOTALS.									
Delhi -	1,917,118	499	1,939	28·1	77	82	1	67	3,590,325	Food Grains and Pulses. Rabi -	96,911	—	188,064	55,181	19,619	359,775			
										Kharif	77,050	—	72,981	21,345	10,474	181,850			
										Total	173,961	—	261,045	76,526	30,093	541,625			
										Other Produce -	50,756	—	35,894	21,801	900	109,351			
										Total -	224,717	—	296,939	98,327	30,993	650,976	13,500	1,527,473	2,191,949
Hissar -	1,232,390	319	3,900	16·8	71	7	10	83	5,421,743	Food Grains and Pulses. Rabi -	76,489	—	20,835	—	20,886	118,210			
										Kharif	41,576	—	2,469	—	5,579	49,624			
										Total	118,065	—	23,304	—	26,465	167,834			
										Other Produce -	40,605	—	9,615	—	1,000	51,220			
										Total -	158,670	—	32,919	—	27,465	219,054	352,610	2,594,408	3,166,072
Umballa -	1,652,728	1,072	13,632	41·9	42	14	1	85	2,564,618	Food Grains and Pulses. Rabi -	1,305	—	94,883	5,200	15,172	116,560			
										Kharif	2,185	—	72,182	20,412	71,036	165,815			
										Total	3,490	—	167,065	25,612	86,208	282,375			
										Other Produce -	—	—	13,432	—	18	13,450			
										Total -	3,490	—	180,497	25,612	86,226	295,825	16,638	1,367,181	1,679,644

	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
	DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
		Food Grains.								
DIVISION.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 20 or is less than Column 20.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
Delhi	Irrigated -	359,775	181,850	541,625	109,351	650,976				
	Unirrigated	469,890	884,481	1,354,371	108,979	1,463,350				
	Total -	829,665	1,066,331	1,895,996	218,330	2,114,326	−77,623	5 to 3	29	41
Hissar	Irrigated -	118,210	49,624	167,834	51,220	219,054				
	Unirrigated	491,930	2,311,328	2,803,258	194,960	2,998,218				
	Total -	610,140	2,360,952	2,971,092	246,180	3,217,272	+51,200	2 to 1	6	11
Umballa	Irrigated -	116,560	165,815	282,375	13,450	295,825				
	Unirrigated	782,417	514,216	1,296,633	169,273	1,465,906				
	Total -	898,977	680,031	1,579,008	182,723	1,761,731	+82,087	3 to 2	18	25

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
Division.	Population by Census of 1868.			Average Annual Rain-fall.	Per-centages on Cultivation.				Total Area in Acres.	Detail of Cultivated Area (in Acres) showing Source of Irrigation.										Distribution of Irrigation between Food Grains and other Crops.							In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
		Per Square Mile of								—	Average Acreage of Crops.									—	Food Grains.								
											Irrigated by																		
	Total Souls.	Total Cultivation.	Irrigation.		Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.			Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.		Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 20 or is less than Column 20.			
										Divisional Totals—*continued.*																			
Jullundur -	2,477,576	758	9,355	63·0	101	21	2	77	3,767,758	Food Grains and Pulses. Rabi -	3,532	—	121,986	387	55,175	181,080				Irrigated -	181,080	159,080	340,160	74,702	414,862				
										Food Grains and Pulses. Kharif	1,887	—	71,592	128	82,473	159,080				Unirrigated	912,279	633,051	1,545,330	197,261	1,742,591				
										Food Grains and Pulses. Total	5,419	—	196,578	515	137,648	340,160				Total -	1,093,359	792,131	1,885,490	271,963	2,157,453	+57,038	3 to 2	18	25
										Other Produce -	200	—	47,071	—	27,431	74,702													
										Total -	5,619	—	243,649	515	165,079	414,862	52,280	1,633,273	2,100,415										
Amritsar -	2,743,858	775	2,516	31·0	55	35	9	56	3,414,820	Food Grains and Pulses. Rabi -	68,118	—	356,660	4,417	3,248	432,443				Irrigated -	432,443	269,233	701,676	111,239	812,915				
										Food Grains and Pulses. Kharif	67,452	—	182,263	5,626	13,892	269,233				Unirrigated	794,696	343,291	1,137,987	215,504	1,358,491				
										Food Grains and Pulses. Total	135,570	—	538,923	10,043	17,140	701,676				Total -	1,227,139	612,524	1,839,663	326,743	2,166,406	−126,092	2 to 1	38	55
										Other Produce -	35,960	—	74,277	679	323	111,239													
										Total -	171,530	—	613,200	10,722	17,463	812,915	224,493	1,255,090	2,292,498										
Lahore -	1,889,593	441	1,319	21·6	112	40	5	55	5,734,912	Food Grains and Pulses. Rabi -	90,765	38,154	488,628	—	410	617,957				Irrigated -	617,957	261,143	879,100	146,394	1,025,494				
										Food Grains and Pulses. Kharif	36,067	20,513	193,851	7,502	3,210	261,143				Unirrigated	583,670	532,628	1,116,298	171,379	1,287,677				
										Food Grains and Pulses. Total	126,832	58,667	682,479	7,502	3,620	879,100				Total -	1,201,627	793,771	1,995,398	317,773	2,313,171	−743,957	3 to 2	44	54
										Other Produce -	13,600	4,300	128,460	—	34	146,394													
										Total -	140,432	62,967	810,939	7,502	3,654	1,025,494	172,186	1,859,448	3,057,128										

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Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued*.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.		12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
	POPULATION BY CENSUS OF 1868.				PER-CENTAGES ON CULTIVATION.					DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.											DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.									
		Per Square Mile of								AVERAGE ACREAGE OF CROPS.												Food Grains.								
												Irrigated by																		
DIVISION.	Total Souls.	Total Cultivation.	Irrigation.	Average Annual Rain-fall.	Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.	Total Area in Acres.	—		Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 20 or is less than Column 20.	In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Percentage is probably raised on Irrigated Land.
										DIVISIONAL TOTALS—*continued*.																				
Rawalpindi -	2,197,357	578	11,074	23·1	408	20	8	72	10,788,264	Food Grains and Pulses.	Rabi -	—	13,000	141,643	—	6,231	160,874				Irrigated -	160,874	77,571	238,445	77,589	316,034				
											Kharif	—	14,000	60,978	—	2,593	77,571				Unirrigated	1,303,698	920,202	2,223,900	298,169	2,522,069				
											Total	—	27,000	202,621	—	8,824	238,445				Total -	1,464,572	997,773	2,462,345	375,758	2,838,103	+102,945	3 to 2	10	14
										Other Produce -		—	25,000	51,655	—	934	77,589													
										Total -		—	52,000	254,276	—	9,758	316,034	142,778	2,276,346	2,735,158										
Mooltan	1,474,579	584	852	7·8	714	69	23	8	12,900,319	Food Grains and Pulses.	Rabi -	—	298,974	310,600	—	2,724	612,298				Irrigated -	612,298	233,853	846,151	288,379	1,134,530				
											Kharif	—	150,518	80,869	—	2,466	233,853				Unirrigated	422,145	34,138	456,283	53,052	509,335				
											Total	—	449,492	391,469	—	5,190	846,151				Total -	1,034,443	267,991	1,302,434	341,431	1,643,865	+14,464	3 to 2	65	74
										Other Produce -		—	152,911	132,828	—	2,640	288,379													
										Total -		—	602,403	524,297	—	7,830	1,134,530	375,619	119,252	1,629,401										
Derajat -	991,342	465	1,715	9·1	605	35	19	46	9,604,552	Food Grains and Pulses.	Rabi -	—	72,203	149,921	—	37,000	259,124				Irrigated -	259,124	117,358	376,482	91,310	467,792				
											Kharif	—	84,958	13,400	—	19,000	117,358				Unirrigated	587,997	453,068	1,041,065	118,050	1,159,115				
											Total	—	157,161	163,321	—	56,000	376,482				Total -	847,121	570,426	1,417,547	209,360	1,626,907	+260,953	3 to 2	27	36
										Other Produce -		—	59,000	21,897	—	10,000	91,310													
										Total -		—	216,574	185,218	—	66,000	467,792	263,093	635,069	1,365,954										

Statement showing for each District in the Punjab the Extent to which Cultivation is protected by Irrigation—*continued.*

DIVISIONAL TOTALS—*continued.*

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
DIVISION.	POPULATION BY CENSUS OF 1868.			Average Annual Rain-fall.	PER-CENTAGES ON CULTIVATION.				Total Area in Acres.	DETAIL OF CULTIVATED AREA (IN ACRES) SHOWING SOURCE OF IRRIGATION.									
		Per Square Mile of									AVERAGE ACREAGE OF CROPS.								
											Irrigated by								
	Total Souls.	Total Cultivation.	Irrigation.		Of Uncultivated Land.	Of Irrigated Cultivation.	Of Sailab Cultivation.	Of Cultivation dependent solely on Rain.		—	Perennial Canals.	Autumnal Inundation Canals.	Wells.	Tanks and Jhils.	Small Channels from Rivers and Streams.	Total Irrigated.	Unirrigated but aided by Alluvial Floods and Percolation from River (Sailab).	Entirely dependent on Rain.	Total Acreage Area of Crops.
Peshâwar	1,035,780	630	3,127	26·5	203	24	2	74	5,229,543	Food Grains and Pulses. Rabi	20,693	—	10,377	370	87,647	119,087			
										Food Grains and Pulses. Kharif	11,345	—	12,830	130	110,559	134,914			
										Food Grains and Pulses. Total	32,038	—	23,257	500	198,206	54,001			
										Other Produce	3,149	—	10,883	58	30,213	44,303			
										Total	35,187	—	34,140	558	228,419	298,304	22,153	1,066,023	1,386,480
Grand Total	17,612,321	518	2,000	26·2	197	26	8	66	63,016,854	Food Grains and Pulses. Rabi	357,813	422,331	1,883,597	65,555	174,112	2,977,408			
										Food Grains and Pulses. Kharif	237,562	269,989	766,465	55,143	321,282	1,650,441			
										Food Grains and Pulses. Total	595,375	692,320	2,650,062	120,698	569,394	4,627,849			
										Other Produce	144,270	241,624	526,012	22,538	73,493	1,007,937			
										Grand total	739,645	933,944	3,176,074	143,236	642,887	5,635,786	1,635,350	14,333,563	21,604,699

1.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.
DIVISION.	DISTRIBUTION OF IRRIGATION BETWEEN FOOD GRAINS AND OTHER CROPS.							In what Ratio does the Produce (Food Crops) of 1 Acre of Irrigated Land to that of 1 Acre of Unirrigated in an Average Year.	Per cent. of Area under Food Grains which is Irrigated.	Of the Average Annual Yield of Food Grains what Per-centage is probably raised on Irrigated Land.
		Food Grains.								
	—	Spring.	Autumn.	Total.	Other Produce.	Total Cultivation.	No. of Acres by which previous Column exceeds Column 20 or is less than Column 20.			
Peshâwar	Irrigated	119,087	134,914	254,001	44,303	298,304				
	Unirrigated	640,299	276,573	916,872	58,046	974,918				
	Total	759,386	411,487	1,170,873	102,349	1,273,222	−113,258	2 to 1	22	36
Grand Total	Irrigated	2,977,408	1,650,441	4,627,849	1,007,937	5,635,786				
	Unirrigated	6,989,021	6,902,976	13,891,997	1,584,673	15,476,670				
	Grand total	9,966,429	8,553,417	18,519,846	2,592,610	21,112,456	−492,243	3 to 2	25	33

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EXTRACT from a MEMORANDUM by R. E. EGERTON, Esquire, Financial Commissioner of the Punjab, dated September 1870, showing the difficulties involved in any attempt to extend irrigation rapidly.

Of the classes of works mentioned in para. 4 of the letter from the Secretary to the Government of India, wells are the most important in the Punjab. The only other works connected with irrigation which have been hitherto constructed by the people are inundation canals, small irrigation channels taken from hill streams, and embankments for storing water. The inundation canals have in nearly all districts been placed under the management of the Canal Department. No new works of this class are undertaken except under the management of the officers of the Irrigation Department.

Works of—

(2.) Drainage. (3.) Reclaiming land from rivers. (4.) Protection of land from floods.	Are undertaken by officers of the Canal Department.

(5.) Works for reclaiming and clearing waste lands will be noticed further on.

(6.) Clearing land from stones and other obstacles to cultivation. There is not at present any demand for advances to clear such lands, as the amount of waste land unincumbered with such obstacles is sufficient for all demands, and it is evident that the lands which cost least for clearing are likely to be cultivated before those lands which require more outlay to bring them into cultivation.

The subject of wells should therefore be first considered.

Proposals have been made on several occasions for the extension of irrigation from wells by means of a system of takkávi advances for whole districts or tracts of country. Mr. Prinsep, in his letter, regarding water advantage rate on lands irrigated from the Khánwáh canal, and more fully still in a pamphlet recently published, pages 33–39, proposes to make advances to the extent of 140 lacs to construct 60,000 wells, to irrigate 1,800,000 acres of land in the Amritsar and Lahore Divisions, and in a portion of Rawalpindi Division.

Major Tighe, in his letter No. 155, dated 16th June 1870, to Commissioner, Umballa Division, proposes a Government loan to Zamíndárs at 5 per cent. per annum, repayable with interest in instalments extending over 24 years, on the security of wells and land. He proposes in this way to irrigate 250,000 acres, and to advance Rs. 8,000,000 for this purpose.

There is no doubt that it would be very profitable to the State to extend irrigation from wells in the manner and to the extent proposed by both Mr. Prinsep and Major Tighe; but it is not practicable to do so, I think, within the time contemplated in either scheme.

In neither of the proposals has anything more than the irrigable area and the cost of the masonry shafts of the wells been considered.

It has been assumed that all the other requisites for the extension of irrigation to the enormous extent set forth in the two proposals* exist already; but it is not shown that there are cattle, or cultivators, or labourers, or artizans enough for the construction and working of wells on anything like the scale proposed. To take Major Tighe's proposal alone, he shows that the number of masonry wells now existing in the Umballa District is 4,798. He proposes to add three times that number to the district in a few years.

The returns of stock in Umballa† show that there are 495,000 cows and bullocks in the district. Supposing that of this number one fourth are bullocks fit for working wells,—this gives 1,23,750 bullocks,—of these, at 4 pair per existing well, 39,824 are now employed in irrigation; balance of bullocks available, 83,826. To work 16,000 new wells 44,174 bullocks are required, in addition to the present assumed number available. To provide the bullocks (44,174 × 50 Rs.) = Rs. 22,08,700 are required, and these must be purchased. Again, the number of artizans employed to provide apparatus for the wells must be very largely increased if the number of wells is increased to the extent contemplated. The census returns of the Umballa District show a very large population of tanners, for here the lao and charas are chiefly in use. The Siálkote returns show a very large number of potters, for in that district there are more than double the number of wells which the Umballa District possesses, and these are all worked by Persian wheels. It is not practicable to give reliable calculations of the proportion in which the number of artizans who provide the well apparatus must be increased to meet the demand caused by the immense extension of well irrigation; but there is no question that the number must be increased very largely.

In the case of Mr. Prinsep's proposal, which extends over the area of several districts, there will be a similar necessity for investment of capital in cattle, and for increase in the number of artizans to provide the well apparatus.

I mention these matters to show that in considering the schemes which have been proposed, regard must be had, not only to the cost of the masonry shafts of the wells, but to other conditions essential to the existence of irrigation from wells on the scale contemplated. It is impossible to believe that in a country where the practice of irrigating from wells has existed for ages, where the people are so alive to its advantages, and where the profits of agriculture have so largely increased under the influence of peaceful rule and fixed land revenue demand, irrigation from wells would not have increased more rapidly than it has done were there not other causes than the difficulty of procuring money sufficient to construct the masonry shafts of wells to retard the increase, and in none of the proposals which have been made for extension of irrigation from wells have these causes been duly weighed. In both Mr. Prinsep's and Major Tighe's proposals the calculation has been based merely upon the amount of irrigable, not unirrigated, area, and the cost of the masonry required for wells enough to irrigate this area.

It is impossible to say how much of the slowness of the people in constructing wells is due to their appreciation of the causes which have been mentioned above, and how much to difficulty in procuring capital for constructing the wells. Some allowance must no doubt be made for the slowness of the people to understand the advantages which Government holds out to them.

The plans proposed by Mr. Prinsep and Major Tighe are both of them admirable in theory, and if they are carried out gradually the result will be profitable both to the people and to the State. What has been said above is not said in hostility to the plan, but merely to show that difficulties which have not been fully considered exist in the way of carrying out the proposals to the extent contemplated by the projectors.

The general feasibility of the proposal to extend well irrigation to a greater extent than heretofore may be tested if deputy commissioners be directed to

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*	No.	Area.
Mr. Prinsep	60,000	1,800,000
Major Tighe	16,000	250,000

† Bullocks.

16,000 × 8 =	128,000
Deduct available	83,826
Balance	44,174

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take up some particular portion of their districts in which irrigation may be extended with probable advantage to the people, and after explaining to the landholders the conditions on which Government makes takkávi advances, they should inquire if the people have the means to carry on irrigation from a number of new wells, and if satisfied on this point they should be directed to make advances under the rules, modified as now proposed. Much may no doubt be done by judicious encouragement, and after careful inquiry; but it must be remembered that any attempt to force advances upon the people to construct wells or any other works without some assurance that the subsidiary conditions necessary to make proper use of the improvement which it is desired to effect exist, will end in nothing but disaster. Advances will be recklessly taken and balances will accrue which it will be impossible to realize, and agricultural prosperity will be checked instead of being advanced.

The amount of available waste lands, the property of Government, in the Punjab is very large.* Much of this is considered barren, but of the amount so recorded there is a large area which requires water alone to make it fertile. Besides the Government lands there is an immense extent of culturable land included in village areas. The reclamation of lands of the latter class is going on gradually through the people themselves, who, under our system of settlement for fixed periods, enjoy the produce of all lands newly cultivated after the assessment is declared. The process of clearing such lands is going on in numberless places at once. The clearance consists in removing bushes and roots, which are valuable for fuel. No expenditure of money is required to make such clearings, and the wood which is extracted from the ground fetches a good price. For clearing village lands, therefore, advances are not required.

Grants of Government waste land to lessees have been made to a considerable extent during late years. As the amount available is so large, it was to be expected that applicants for leases would select the lands which, from being good quality and from being situated in places where labour is readily procurable and means of irrigation available, presented the best prospect of being profitably cultivated. Many leases of Government lands have been granted to persons possessed of capital on easy terms for fixed periods. Advances for clearing these lands have not been given, nor do the existing rules provide for advances being made for such a purpose.

Considering the immense area of village lands which is uncultivated, and the impossibility of cultivating more than a small portion of the Government wastes without canal irrigation, it is undesirable to make large grants of Government waste lands at present, and it is not necessary to give facilities for obtaining grants of takkávi for clearing such lands. If it is desired to extend cultivation in Government waste lands, a system of leases on easy terms offers quite as much encouragement as a grant of takkávi; such a lease involves no direct expenditure, and is a mode of encouraging cultivation entirely in accordance with native custom.

Mr. Prinsep has recently published a paper on the subject of constructing State canals in waste lands the property of the State.

Mr. Prinsep's proposals are not, strictly speaking, connected with the subject of takkávi advances. I may remark, however, that according to all the experience hitherto obtained in leasing waste lands it is exceedingly improbable that land will be taken up to the extent of 2,500,000 acres, at Rs. 10 per acre, if granted revenue free for ten years, even with the prospect of irrigation from canals being available. In order to bring this amount of land under cultivation, 500,000 adult cultivators will be required, or a cultivating population of at least one and a half million, exclusive of non-agriculturists. The area to be brought under cultivation is equal nearly to the whole cultivated area of the Umballa and Jullundur Divisions, and it is quite out of the question to suppose, even if the money to pay for the land were forthcoming, that a population sufficient to cultivate the whole or even one half of the land in the time proposed can be found. A far more gradual extension of irrigation and cultivation must be looked for.

If canals are made from the Sutlej, Chenab, Jhelum, and Indus, through those parts of the Doábs which are without irrigation, the Government waste lands will rise enormously in value. This is shown by the increase in the value of waste lands in the Lahore district commanded by the Bari Doáb canal. The increase is so remarkable that it is very doubtful whether it is advisable to dispose of the waste lands at all until the canals are made.

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* Census Report.—Statement II. Explanation Statement.

		Acres.
Culturable	- -	33,26,822
Barren	- - -	60,61,277
Total	- -	93,88,099

Census Report.—Statement II. Column 7.
Acres 1,28,52,821.

NORTH-WEST PROVINCES AND OUDH.

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Provinces
and Oudh

Mr. Buck.

The remarks which have already been made in describing the four belts into which the province has been divided (chiefly with regard to the condition of moisture above and below the soil) will have given a rough indication of the existing conditions of each portion of the province with respect to irrigation, and the following remarks will be confined chiefly to the question of future protection from drought.

Protection from drought in sub-Himalayan Belt.—The sub-Himalayan belt has been shown to be in ordinary years almost independent of irrigation, and even in years of moderate drought may be considered as thoroughly protected, but, perhaps, for this very reason it is a country which suffers more than any other in a year of extreme drought. So we find that in the Bengal famine of 1874, the only parts of this province which can be said to have suffered extremely were the sub-Himalayan tracts of the eastern districts, notably Basti and Gorakhpur; and again under the failure of rains in 1877 (which was this time greater in the west than in the east of the province) the sub-Himalayan tracts of the westerly districts were most affected, and notably Bijnor, Moradabad, Bareilly, and Sháhjahánpur.

It is easy to understand that the crops which have become the staple crops of the sub-Himalayan tracts are those which require most moisture, and that if a serious failure of rain occurs it is hopeless to attempt to supply its place by well irrigation, even supposing that the agricultural population were able to dig wells in time. But, as it is, wells are so little used in ordinary years that the inhabitants are not competent to make anything like a full use of the means of irrigation which lie below their feet. The following remarks made in the Moradabad reply illustrate this statement: "In ordinary years the narrow well, with "a small earthen pot holding only about a gallon of "water, suffices for the cultivator's wants, and so he "does not try to improve on it, and suffers accordingly when the bad year comes."

The question at once arises what steps should be taken to oblige the agricultural population here to construct wells of such a character as would be sufficiently useful in year of drought to protect them

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against the wholesale destruction of produce to which past history shows their land to be especially subject. Wells cannot save the rice, but they can in the autumn season save a sufficient quantity of millets, pulses, and carrots to supplement to a material extent the food of the district. They can also raise fodder for cattle and save some of the sugar cane (which can be exchanged for grain), and, in the spring can be made to protect a large per-centage of winter cereals.

No information has been afforded by district replies as to the area which can be protected by a single well in a year of extreme drought, but it must be the case that the area will be greatest in that part of the province where the water is nearest to the surface, and that a larger per-centage of crops could be grown with well irrigation in the sub-Himalayan tract than anywhere else in the north of India. Rice tracts are, of course, excepted; wells cannot be maintained in them, and if they could, the water volume would not be sufficient for the requirements of rice. There is, however, reason to believe that something might be done for the rice tracts by a further utilisation of the small streams issuing from the mountain range. In the words of the Bijnor settlement officer already quoted, the irrigating power of these rivers is by no means worked up to its potential limit. The Superintendent of Tarai, however, remarks that the rivers which feed his rice fields run nearly dry in the years of drought, and the only streams which are likely to be useful under pressure are those which take their rise well within the mountain range, while perfect safety is possibly only to be found in those streams which are fed from snows. It becomes a question, therefore, whether river power ought not to be concentrated more upon rice tracts than is now the case, so that if the remaining area should be sufficiently protected by wells and well-gear of efficient character, as much rice may be saved as possible by canal irrigation. It seems, indeed, wrong in principle to run canals throughout a tract of country which requires so little water in ordinary years, and it seems equally wrong not to protect by wells a country which can be so easily protected by them. These questions appear to require thorough investigation and decided action, for while there is no doubt that the sub-Himalayan belt seriously requires protection, there is also no doubt that protection can be provided at a comparatively small outlay.

Protection from drought in the Rohilkhand and Ganges-Gogra tract.—The Rohilkhand and Ganges-Gogra belt is one in which the cultivating population acknowledge the need of irrigation by extensive use of wells, and by the utilization of river water which in ordinary years is largely available. In the eastern districts of the belt, tanks largely supplement these two sources of supply. The same elements of failure, however, which exist in the sub-Himalayan belt exist in this belt also, though somewhat in a different form, that is to say, the means of irrigation employed in an ordinary year fail to a serious extent in a year of drought. The supply of water in the rivers becomes scanty and is drained by the villages lying nearest their source, so that the larger number of villages lose their supply altogether. Their wells are, to use the words of the settlement officer of Sháhjahánpur, "simple and primitive arrangements, usually full in "every rains, and are seldom spring wells." There is, moreover, much lowlying land in the broad river valley already described in which the lever well is the only one employed (*i.e.*, "the well in which a small "earthen pot is attached by a rope to the long end of "a lever, weighted at the other end by a lump of mud,"), and such wells supply a very small quantity of water. Masonry wells are practically unknown in Sháhjahánpur and in some other districts in the same belt; and although it is true that the eastern districts have done more to protect themselves than the western districts by the construction of masonry wells, yet, except in Azamgarh and Jaunpur, the number is not large, and even in those districts much greater dependence is placed on tanks than on good wells. While, therefore, almost the whole of the area of the belt under notice may be described as irrigable or even irrigated, yet the real protection afforded by irrigation is very small. The first question which arises is whether a canal or canals should be run through the belt. The Sardah canal was intended for the upper portion of it, but was vetoed both by the officers who had the most intimate acquaintance with the districts concerned and by the landowners in Oudh. There is, indeed, the same objection to a large system of canals here as in the sub-Himalayan belt,—that water is not wanted in ordinary years, and is also sufficiently near the surface to make a well system practicable except for rice tracts, while the introduction of a network of canals would raise the water level, already, perhaps, too high for the health of the inhabitants, to an unhealthy proximity to the surface.

On the other hand the rice area is so large, and supplies so great a proportion of the food of this belt, that it becomes a question whether some means cannot be contrived for supplying them with water in rainy seasons without attempting to carry canals along the higher land. As far as can be ascertained there are in the North-Western Provinces tracts of this belt over two million acres of rice land, and there are probably not very much less than two millions more in the Oudh section.

The protection which is required for the belt under notice is therefore of two kinds,—the extension of good masonry wells on the upper tracts, and the artificial irrigation by canals of rice tracts. There is no doubt that measures ought to be taken at once for well extension, and that the problem ought to be attacked of obtaining a command of water for the most extensive rice areas in seasons when there is a failure of rain. The most promising remedy is probably a scheme of inundation canals which are essentially suited to the irrigation of lowlying lands over which water can be carried at minimum expense, and schemes have already been sketched in some localities under which river water could without any extravagant cost be concentrated on rice lands.

Protection from Drought in the Doab Belt.—The third or Doab tract must be considered in its two sections separately, namely, (1), the north-west section irrigated by canals; (2), the south-east section not irrigated by canals.

A review by the Secretary to the Board of Revenue of the circumstances of the Meerut district as they existed at the time of settlement about ten years ago, presents a typical picture of the change effected in a Doab district by canals, and is quoted at the end of this paper, and should be read in connection with the following remarks.

The necessity for artificial irrigation in the Doab tract is more marked than in either of the two first described, the fact being that irrigation is a desideratum even in ordinary years for the majority of winter crops. Wells of durable character are usually constructed by cultivators of industrial character, such as the Jats and Kurmis, and temporary wells are numerous in all tracts where they can be easily dug; as elsewhere remarked, however, it is unfortunate that highland canals were obliged to coincide with the best well tracts which always are found in the water-sheds. This is noticed by almost every settlement officer who has worked in the Doab, and I quote the following remarks by Mr. Crosthwaite (writing of Etáwah) in order to illustrate this statement, which is further corroborated by the review on the Meerut district quoted below. Mr. Crosthwaite, in noticing the projected extension of the Lower Ganges canal, writes :

"The line of the canal will pass through one of the most fertile and best watered tracts, as a rule, in the whole district. No benefit that it is likely to confer will compensate the villages through which it will pass for the loss of their good land, the damage to their wells, and the inconvenience and stoppage of communications caused by a large canal.

"Leaving this tract and going into the body of the

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pargana which will be irrigated from distributaries, the country changes in character. There is a very large area of usar,—nearly 37 per cent. of the total area,—scattered over the pargana. This soil is at present of a dark scabby character, called in the local dialect, *papur*. The cultivation is partially scattered in the usar plains, but the mass of it is found in compact continuous blocks more or less extensive in area, separated by tracts of usar from each other. Now these blocks of cultivation are the only parts that it would be feasible to irrigate, and they are exactly those parts which are most amply supplied with water.

" The wells as a general rule are excellent and numerous. In fact, except in a few villages, all the good compact land is irrigable; water is seldom more than 24 feet, and over a great part of the country is not more than 18 feet, from the surface. The supply of water is ample, 55 per cent. of the cultivated area being irrigable from wells and 14 from other sources. In 1868–69 the wells did not fail, and the country did not suffer from the drought,"

Mr. McConaghey, Settlement Officer of Mainpuri, notices in his report on that district that "over the central portion of the district" (the same portion already described on page 12 as a tract of such wonderful fertility) "the canal has raised the water " level considerably, and has affected the durability " of kucha wells near its channels most materially. " By the sandy strata nearer the surface being " saturated, it is now impossible in many instances " to sink a common kutcha well down to the real " spring below the layer of clay where formerly there " was no difficulty."

This observation shows that not only have canals occupied what were already the best protected tracts, but have also destroyed in them the ordinary means of irrigation, so that water cannot be carried by canals to the poor outlying country near the rivers without being obliged to irrigate the land formerly covered by wells. This is distinctly borne out by the lowness of indirect revenue credited to the canals in these provinces, which is only assessed upon land not previously irrigated. The total credit to the end of March 1877 was less than 10 lakhs of rupees. On the other hand, well irrigation is, with water at the depth at which it lies in the Doab belt (namely, from 20 to 30 feet, and in some parts from 30 to 40 feet), so much more expensive and difficult than canal irrigation, that the substitution of the latter affords a much more complete protection.

There seems to be a strong necessity for extending water-courses from the main canal branches to the poorer tracts not sufficiently protected by wells, and which have not yet received canal water. Reference may be made to the last paragraph of the quoted review of the Meerut settlement which affords an excellent illustration of this point. Mr. Crosthwaite's description of the central fertile tract of Mainpuri, which, although not requiring canal water, has received it because lying on the water-shed, has already been quoted. But one of the three tracts into which the settlement officer has divided the district (namely, that which lies to the north,) skirts the river Kali Nadi (a feeder of the Ganges), with respect to which Mr. Crosthwaite uses the following words: "The characteristics of this tract are pre- " ponderance of sand in the soil, *scantiness in irriga- " tion*, and great susceptibility to fluctuations of " season." The same conditions occur in Farukhabad, where the canal irrigates the whole of the well protected loam tracts on the water shed, but only a limited per-centage of the dry villages lying along the sandy belt above the River Isan, another Ganges feeder.

[The proposal to carry irrigation to poor sandy villages does not clash with the argument that it is desirable to irrigate the best land rather than the worst land, since the term "best land" thus used means "that portion of a village which can be manured and grow good crops," *i.e.*, that portion which can pay the highest price for its water. This explanation is given because a misunderstanding has often been found to exist on the subject.]

As, however, there are whole tracts thus unprotected in the centre of a canal system, so, too, there are unprotected villages in the centre of a fully irrigated pargana, and the cultivators of which are as much distressed in a year of drought as if they were surrounded by a cordon of villages equally dry. It must not therefore be hastily decided that the upper section of the Doab is sufficiently protected because its map is covered by a labyrinth of canals. Those villages that require water most get least. To offer yet another illustration, the following words of another settlement officer may be quoted. Mr. Smith writes of the Aligarh district:—

" In the Atrauli tahsil another canal will be seen traced on the map. It represents a projected continuation of the Fatehgarh branch of the Ganges canal, and its course was laid down many years ago and the necessary land taken up, but nothing more has yet been accomplished. The line runs between the Ken and the Ganges, and of all tracts in the country round about there is none which so urgently need water. My description of the district has shown that this is a sandy tract, where temporary or kucha wells are impracticable, and where water lies at from 40 to 60 feet below the surface. It is to be regretted that it has been found either impossible or inexpedient to carry out the project, while in other parts of the district water has been given liberally either where it is not needed at all, or where it is far less needed than here. The Lower Ganges canal, which starts from Narora in Bulandshahr, and which in Aligarh will pass along the khádir of the Ganges, will of course not affect the upper lands, and, as far as this district is concerned, will only traverse a country where the soil is already, perhaps, too moist."

It is fair to this (the Lower Ganges) canal to explain that it was intended to pass through good tracts to bad ones; but Mr. Smith's remarks explain distinctly the unfortunate necessity which exists in the Doab of laying down the principal lines in country which least requires canal water

The reason why wells are numerous in the centre and scarce in the border of the strips of land lying between the river feeders of the Ganges and Jumna has been partially explained by previous remarks. The centre, which is usually slightly depressed, is full of loam deposit, and the soil in which the wells are dug is stiffer than on the slopes to the rivers, while underneath the surface water is drained away slowly from the central tract and quickly from the marginal tract, a circumstance which renders the disturbance of sub-soils much more severe in the marginal than in the central sub-strata, and the consequence is either that wells cannot be dug at all, or that when dug they are more and more unstable as the rivers are approached.

The facts which have been brought forward indicate clearly the desirability of extending the existing canal system to the marginal tracts which so much need irrigation, and in which, on account of the large per-centage of poor soil, the annual out-turn is at present subject to so much uncertainty.

There are at the same time certain areas into which it is probable that canal water will never come, and in which measures must be taken for constructing durable wells. The tracts noticed in Meerut by Mr. Forbes are of such a character, and similar cases have lately been brought forward by other officers, and steps ought to be taken to ensure the protection of these areas. It has been noticed that three fourths of the Upper Doab is still unirrigated by canal, and it is clear from the preceding remarks that it includes much land which sorely needs irrigation.

Crossing now to the Lower Doab, which comprises part of the Cawnpore, Fatehpur, and Allahabad districts, the extension of the Ganges canal was refused partly on the grounds brought forward in this note. The irrigation statistics of these districts are misleading, because they include a very large area of land which does not belong to the belt now under discussion, and which is practically unirrigated, belonging as it does to the South Jumna belt. The irrigation of the Doab belt portion of the districts is, except near the Ganges and its feeders, very much like that described in the central portion of the Mainpuri district, and (it is believed) can be made practically sufficient for protection. There is no doubt that great variation occurs in the substrata, and that masonry wells are needed in the greater part of the area to ensure permanent irrigation, but there appears to be no reason why the experiment should not be tried in this part of the Doab (which is so distant from the head of the canal) of ensuring what protection wells can be made to afford. Measures, which will be described further on, have already been taken to attack the problem. It is understood from the reports of the settlement officers who were engaged in the district of the Lower Doab that wells are feasible in nearly the whole of the area, and it is contemplated to ascertain by actual experiment whether such is the case.

The banks of the Ganges are difficult to irrigate from wells, but the strip of unirrigable land which lies along its border is so narrow that its need for irrigation would not justify canals. Here, as in the Jumna land, water is from 50 to 80 feet from the surface, and the question has been raised whether the river water could not be lifted by machinery to irrigate the cultivated area in the vicinity.

Protection from drought in the South Jumna Belt.—The last tract to be considered is the South Jumna belt. Of this it may be at once stated that the more canals that can be brought into it the better. Water is not only far from the surface, but is in many parts of the country of a saline character. The need of canal irrigation in this portion of the province has of late years been fully acknowledged, and the Lower Ganges canal is now carried along the north edge of the Jumna ravines through the Mainpuri, Etáwah, and Cawnpore districts, the Jumna canal through the south of the Muttra and Agra districts, while the Betwa and Ken projects will irrigate a considerable portion of the Jalaun and Bánda districts. What more can be done can only be decided in the Irrigation Department, but the problem is one which ought to be placed before them to investigate. There seems *primâ facie* reason to believe that an extension of the Ganges canal system may be carried into the north Jumna strip of the Muttra and Agra districts, but it is doubtful whether there is sufficient water in the Betwa and Ken (rivers not fed from the snows) to supply effectively more than a limited area in the Bundelkhand country, or whether the Ganges system can be made to extend further along the North Jumna bank of the Cawnpore, Fatehpur, and Allahabad strips. All that can be said now is that if canals cannot be brought there, wells are comparatively useless.

It may not be out of place to advert here to another suggestion which has (I believe) been brought to the notice of the Forest Department, with respect to the raviny land skirting the Jumna, to the effect that this land can be made most serviceable to the country by being utilised for forest and pasturage. It would be easily enclosed by a continuous fence, and the measure would save Government from the anxiety and expense of watching over the safety and lives of the scanty population who are now continually driven, even under moderate failure of rain, to the greatest distress. How far such a proposition could be carried out without interfering with the cultivation of the fertile patches which occur in the valleys of the ravines and on the edge of the Jumna, and what the cost of the project would be, are questions which, without inquiry into it, would be impossible to answer; but the need which the Doab has of pasturage and forest makes the question one well worthy of investigation.

The extreme south of the Bundelkhand districts obtains some (but not a great deal) irrigation from the lakes which have been dammed up in the low hills. Unfortunately, their power to protect under a drought has been proved to be very small, and even in the present year their level of water in some is below that of the water-gate.

Extracts from Review by Board of Revenue on Meerut Settlement Report.

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" 24. *Irrigation.*—Before the introduction of the canal, the irrigation of the district naturally coincided very much with the character of the soils. In good stiff clay or loam earthen wells were good and lasting, but where the soil was sandy and shifting, such wells were either more or less unstable or quite impracticable.

" 25. In some of these latter tracts, and especially in the Jat villages above the Jumna and Hindan, masonry wells have been extensively constructed, and there are about 600 pucka wells in each of the parganas of Loni and Baghpat, in which the level plain of the Hindan-Jumna Doab begins to slope towards the river, and in which, therefore, the upper strata are disintegrated and rendered unstable by the action of drainage.

" 26. The best well tract seems indubitably to have been the level portion of the Hindan-Jumna Doab, but the country between the Hindan and Kali Nadi, except on the river banks, was also favourable for wells.

" 27. The general conclusion which may be formed from the pargana reports is that wells could be dug with greater facility and of a more lasting character in proportion to their distance from drainage lines of magnitude. The best well tracts were on the water-sheds. When, therefore, canals were introduced in the only direction in which canals can be made serviceable for purposes of irrigation, *i.e.*, along the water-sheds of the district, it was a natural consequence that they should traverse those tracts which were most fully irrigated by wells, and avoid those in which the loose and broken condition of the surface formed almost as great an impediment to irrigation channels as to wells.

* * * *

" 31. It is certain that the introduction of canal irrigation has given a great impulse to cultivation and production in the district. Mr. Porter remarks in Kithore on the improvement effected by it in sugar cultivation, and Mr. Forbes attributes the improvement of the agricultural condition of the Gujur tracts on the Loni slope to the civilizing effect of the canal. He notices, too, a remarkable instance of its influence in the pargana of Barnawa, where in the dry year of 1869 he found the cultivators of the north section, from which canals are excluded, selling their sugar mills to the cultivators of the south section, which is plentifully watered by canals. This fact speaks for itself.

" 32. It is no doubt greatly in favour of the immediate success of a canal that it should enter into a thickly populated country, where a large supply of manure may cope with the exhausting powers of a practically unlimited water supply, and where there is sufficient labour available for its utilization. The density of the population in the best parts of the Meerut district is large. In Baraut the number of inhabitants per cultivated square mile is no less than 944, and in such tracts, heavily manured as they must be, it is almost impossible that too much water can be given. Where, on the other hand, the population is more scanty, the improved facility of irrigation will admit of its gradual increase, but meanwhile it is possible that an excessive supply of water may cause the temporary exhaustion of the irrigated area.

" 33. There is no doubt that there has been an extensive increase in the irrigated area since last settlement, which is said to have increased from 232,949 to 578,512 acres, and though (as Mr. A.

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Colvin remarks in his memorandum on settlement in the North-Western Provinces) these figures must be received with caution, yet the fact of a very large increase in the irrigated area cannot be doubted. The increase in cultivation is also due in some measure to the same cause. The western canal had not been long opened when Sir H. Elliot remarked that already it had caused all the waste in the neighbourhood to be reclaimed, and the same influence may be attributed to the extension of canal irrigation on other parts of the district.

* * * *

"35. Amid all the improvements acknowledged to have been wrought by the canal one charge has been brought against it of a serious character, to which reference has already been made. Mr. Forbes complains in Chaprauli that the uncertainty of the water supply is so great an evil that he cannot but regret the substitution of canals for wells. In Baghpat he is inclined to think irrigation is excessive, and if that is the case, it seems a pity that the water supply should not be kept within more confined but less uncertain limits.

"36. Another complaint made by Mr. Porter in Sardhana is that individual villages have suffered in consequence of the vicinity of the canal, which, while throwing down their wells by raising the water level, has not compensated them with a supply of water equal to that which they have lost.

"37. Some allusions are also made to the obstruction caused by canal watercourses to the natural drainage of the country.

"38. It is satisfactory to find that the evils of which complaints are made are of such a nature that it lies within the power of Government either greatly to alleviate or entirely to remove them. Steps have already been taken to provide against the obstruction to drainage in some parts of the district, and Rs. 2,000 were granted at the commencement of the present year (1873) for a drainage cut in the Chaprauli pargana.

"39. A very small portion of the district is now insufficiently watered. The cliff above the rivers and the tract of undulating sand above the Ganges are, however, scantily irrigated, and as the soil in such tracts is of the poorest description, cultivation is very precarious and distress in dry years very great. Mr. Forbes anxiously calls attention to this subject. It is questionable, indeed, whether the indiscriminate introduction of canal irrigation, even if it were feasible, would at once raise the character of such tracts. To flood a poor unpopulated tract with a sudden flush of water is more likely to exhaust its already sterile soil than to increase its productive powers. But a gradual extension of irrigation cannot fail to be of the greatest benefit even to the poorest soil, and there is little doubt that Mr. Forbes suggestion of takávi advances for the construction of pucka wells in Garhmukhtesar may be plied with advantage both in this and other districts to all the sandy tracts along the banks of the Ganges which lie beyond easy reach of the canal. It appears desirable that the subject of takávi advances in such tracts should be taken into active consideration, unless, indeed, it is contemplated to introduce canals. But Mr. Forbes represents on behalf of the cultivators in some parts of the Hapur and Jalalabad parganas and other tracts now cut off from the canal that they should be told once for all what is the prospect of their being supplied with canal water, in order that they may know whether or not to sink capital in the construction of wells, which, in their present state of uncertainty, they cannot venture to do.

EXPLANATION OF STATEMENT I.

In Statement I. is shown, for each district of the North-Western Provinces and Oudh, the area of cultivated land estimated as irrigable from canals, wells, or other sources, as well as the area estimated as actually irrigated.

The irrigable area refers to the measured area which can, with existing means of irrigation, be irrigated one year with another, while the irrigated area refers to the crop area of one normal year, which area is swelled by the inclusion of second crops where such are grown. Hence, in some cases, the irrigable area will not appear so much in excess of the area actually irrigated as might be expected, since a certain amount of land is included twice over in calculating the latter.

Example.—Suppose that the area ordinarily cultivated in one year is found to be 800,000 acres. In 1876, 400,000 were under autumn crops, and 430,000 under spring crops,—total, 830,000; 30,000, therefore, must have been under both autumn and spring crops, 800,000 being the limit of the measured cultivation. So, too, out of the 800,000 acres, 300,000 acres of land might be irrigated in one year, but the actually irrigated area of crops might be (say) 320,000 acres, or 20,000 acres in excess.

The figures given for irrigable area in the districts of the North-Western Provinces are based on district officers' replies, on statistics published by the Board of Revenue in 1872, and on the reports of settlement officers where available. For the Oudh districts the irrigable area has been calculated by adding to the area assumed as actually irrigated an amount proportionate to the difference between the two in North-Western Provinces districts of parallel circumstances.

The irrigated area has been calculated for the North-Western Provinces districts from the crop statements for 1876–77 filed by patwaris (village accountants), from district officers' replies, and, where possible, from any recent settlement report. For the Oudh districts the irrigated area has been calculated from the replies of district officers and the figures given in the Oudh Revenue Administration Report for 1875–76.

For the area of canal irrigation, figures have been abstracted from the Irrigation Report for 1876–77.

Under well irrigation is included all irrigation from wells of whatever kind, whether earthen or masonry, percolation or spring.

In "other sources" are included tanks, natural and artificial jhils or lakes, ponds, and rivers.

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SUPPLEMENTARY ANSWER TO QUESTION 4.

It should be explained here that irrigation as ordinarily practised is for the most part confined to the fields in which the rabi or winter crop is sown, and to garden cultivation. Speaking broadly, nearly all the wheat and about half the barley is irrigated, as well as sugar-cane, opium, and garden crops. A reference to the crop statement in the answer to Question 3, will show that the area of the different kinds of irrigated produce may very roughly be stated as follows:—

	Acres.
Wheat - - -	9,000,000
Barley - - -	700,000
Sugar-cane - -	820,000
Garden crops and opium -	500,000
Total - -	11,000,000

In the rainy season the wells are almost entirely idle; the cattle are busy in ploughing and preparing the soil for the rabi, and are seldom set to irrigate, unless a prolonged break in the rains occur, and it is

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necessary to water some valuable crop which would otherwise perish. In the cold weather the bullocks are incessantly employed in irrigating the rabi crops. But as the general custom is, where the land admits of it, to sow rabi and kharif in rotation, a well which irrigates five acres of rabi in one year will irrigate a different five acres of rabi in another year; the whole 10 acres are, therefore, returned as irrigable. Thus, as far as wells are concerned, the irrigable area is nearly double the area irrigated in any one year, not quite double, because some of the land is under garden crops, &c., and is irrigated every year. With canal irrigation the case is different. The water-supply being abundant, and available without diverting the oxen from their labour at the plough, is largely used during the monsoon; crops are grown by the help of it which require a more regular supply of water than the precarious rain-fall; but still the rabi area irrigated by canals is always larger than the kharif area. Lastly, irrigation from ponds and streams is mainly given to such crops as grow in depressions and valleys, because the water lies in depressions and cannot be lifted far. These are either rice in the kharif, or else rabi crops; but the irrigable area in this case is the same as the area ordinarily irrigated, since rotation of crops is seldom possible in such lands. It follows from this that a well irrigated area of 5,800,000 acres indicates an irrigable area of about 10 million acres; that is to say, the wells which in a given year actually supply water to 5,800,000 acres will in the course of two years supply water to the crops that want it, which are broadly speaking, the rabi crops on 10 million acres. Similarly, canal irrigation of 1,100,000 acres will indicate that about 1,500,000 usually get water from the canal for the rabi crops that require it; but the irrigation in an ordinary year of 4 million acres from ponds and streams indicates that only 4 million acres of land can be irrigated in this way. Thus it will be understood that an irrigated area of 10,900,000 acres in the North-Western Provinces implies that about 16 million acres of land are so situate as to be capable of irrigation, though they could not all be irrigated in one year, because of the limited working capacity of the cattle, and because the crops sown on the excess 5 million acres are not such as ordinarily to require water.

2. Mr. Buck's statement shows that in the North-Western Provinces (excluding Kumaun and Garhwâl and the hill tract of Dehra Dun), out of a total cultivated area of 25,344,000 acres and a total cropped area of 27,109,000 acres, there were in 1876–77—

Canal-irrigated	-	1,148,000 acres,	or 4·5	per cent.
Well-irrigated	-	4,480,000 „	17·7	„
Irrigated from other sources	-	1,985,000 „	7·8	„
Total	-	7,613,000 acres,	or 30	per cent.

In Oudh, with 8,299,000 cultivated acres and 9,057,000 cropped acres, there were—

Well-irrigated	-	1,314,000 acres,	or 15·8	per cent.
Irrigated from other sources		1,982,000 „	23·9	„
Total	-	3,296,000 acres,	or 39·7	per cent.

The degree of protection offered by these different sources of water supply is however widely different. The greatest security of all is provided by the canals, which may almost be said to afford perfect immunity against drought to the lands they water, except in the case of an extraordinary season like that of 1877, when the atmosphere was as dry in July, August, and September as it is usually in May, and a hot west wind blew which shrivelled up the plants, even while water was being poured on to their roots. The canal irrigation, however, is limited in its area, being almost entirely confined to the districts of the Doab. The only exceptions are the small canals in Rohilkhand and the Agra canal which waters the trans-Jumna parts of Agra and Muttra, but which as yet has by no means reached its full expansion. The same may be said of all canals in season of drought; the area irrigated in 1877–78 having exceeded that of 1876–77, and having been in its turn surpassed by the season of 1878–79*—

Canal-irrigated area, 1876–77	-	1,148,000
Average of 10 years, 1868–78	-	1,155,873
Area irrigated in 1877–78	-	1,412,460
Ditto 1878–79	-	1,694,000

On the other hand, the least secure of all means of irrigation is that from ponds and tanks and small streams. These dry up generally in the hot weather, and if they are not replenished by the monsoon, would be of no avail for irrigation in the ensuing season. Their beds, however, would generally retain some moisture, and would be culturable on such an occasion.

3. The area of the different belts into which Mr. Buck has divided the province for the purpose of depicting its agricultural condition cannot be precisely given; but the following figures of the main divisions of the country show approximately what proportion of the cultivated land in each is protected by irrigation.†

Name of Tract.	Total Cultivated Area.	Total Irrigated Area.	Per cent. on Cultivated Area.	Irrigated Area, deducting that from Ponds and Streams.	Per cent. on Cultivated Area.	Population.	Minimum Food-Consumption of Population at 4½ maunds per head.	Irrigated Area required to produce that Food-supply.
							Mds.	
Doab - -	9,218,000	3,524,000	38·2	3,212,000	34·8	11,011,000	49,550,000	4,130,000
Rohilkhand - -	4,420,000	846,000	19·1	572,000	12·9	5,436,000	24,460,000	2,040,000
Oudh - -	8,299,000	3,296,000	39·7	1,314,000	15·8	11,200,000	50,400,000	4,200,000
Eastern Tract - -	7,541,000	2,925,000	38·8	1,597,000	21·2	9,671,000	43,520,000	3,630,000
Trans-Jumna -	4,092,000	297,000	7·2	242,000	6·	3,802,000	17,110,000	1,420,000
Total -	33,570,000	10,888,000	32·1	6,937,000	20·7	41,120,000	185,040,000	15,420,000

There is probably no part of India which is so efficiently protected from the calamity of drought as the Doab; and this is partly due to the great sums laid out by Government on the Ganges and Jumna canals, partly to the solidity of the sub-soil, which makes it comparatively easy to sink wells. Moreover, the opening of the Lower Ganges canal will soon and largely increase the area thus protected. Rohilkhand has a moist soil, as has been already described, but it is poorly off for wells in comparison with the Doab. Oudh is better provided than Rohilkhand with wells, and indeed, if irrigation from ponds and streams is included, it stands ahead of all these territorial divisions; but they are a precarious source of supply. The eastern part of the North-Western Provinces is not only better protected than Oudh by

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* See St., No. II.

† In this statement Dehra Dun, Kumaun, and Garhwâl are omitted

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the number of its wells, but also has a more secure climate, the failure of the rain being an event almost unknown there, so that the irrigation from ponds and streams is less uncertain than elsewhere. But the country which is by far the worst off is the trans-Jumna tract, where irrigation covers only 7 per cent. of the cultivated area, while even of that the greater part is due to the Agra canal; and in the districts of Bundelkhand proper the proportion of area irrigated is less than 3 per cent. of the whole. A difficulty, however, arises here which exists in no other parts of the North-Western Provinces; and that is that the black soil of Bundelkhand does not in ordinary seasons require irrigation for any but garden crops; it is singularly retentive of moisture, and if the rainy season is normal, and the rains do not cease too early, the winter crop of cereals stand in no need of artificial irrigation. If, however, the rains are too scanty, or cease so early that the soil dries up before sowing time, it becomes hard and cracks, and cannot be cultivated. In such cases irrigation would be useful; but these calamities are too exceptional for any measures meant to remedy them to be financially remunerative; and as the habit of watering the land does not exist, the people would hardly know how to use water if it was supplied to them in years of drought. It is believed, however, that if canals can be made from the Betwa and Ken rivers, and if the supply of water in those streams, aided by artificial reservoirs, is found sufficient, the custom of irrigating the crops and of preparing the land for irrigation will gradually grow up, and there will be a large extension of manured and highly cultivated garden land which does confessedly need the application of water.

4. Before concluding, some remarks are required concerning the using of the term "protection from drought." In Colonel Baird Smith's Famine Report of 1861 a tract is said to be protected in which a third of the cultivated area can be irrigated in any year; and the term is used in this sense by canal engineers in general. It does not, however, seem to be a correct use. A country can only be said to be protected from famine if it can always produce enough food to support its population. If in any country ordinarily in good years an irrigated acre produces three times as much food as the population dependent on that acre require, then that country is protected from drought if a third of its cultivated area can always rely on an artificial supply of water. But it has been shown in the answer to Question 3 that in the North-Western Provinces and Oudh the cultivated area only produces 20 per cent. more food than its population require in an ordinary year, so that it would be necessary for 80 per cent. of that cultivated area to be supplied with water in order to make its inhabitants independent of the seasonal rains. Even allowing that the people would cut down their food consumption in time of famine from 5¾ maunds a year to a minimum of 1 lb. a day, or 4½ maunds a year, the food requirements would still be 62 per cent. of the ordinary out-turn; and if, again, we admit that in however severe a drought some rain will fall, and some crops be saved by it and by the sowing in moist low-lying lands, still about 50 per cent. of the ordinary harvest would have to be raised (in the worst conceivable case) by artificial means; and therefore, in order that the country should be "protected from drought," it is necessary that at least 50 per cent. of it should be irrigable in any one season. Clearly it cannot be asserted of any part of the North-Western Provinces or Oudh that it enjoys such complete protection as this. And even if such an extension of irrigation as this could be obtained, which seems hardly feasible, inasmuch as it implies the raising of the securely irrigated area from 7 to 15½ million acres, it would not be possible to secure that each village should be separately supplied with water enough for half its cultivation. There would be still tracts of absolute desert surrounded by belts of fertility; and the prevention of famine would still depend, as it does now, on the power of the inhabitants of those desert tracts to purchase food from those who possess it.

5. There is, however, another way of considering the question. Speaking broadly, an irrigated acre (if properly cultivated and manured) produces almost twice as much as an unirrigated acre; and thus the average produce per acre having been found to be 10 maunds, the irrigated acre will produce about 13 maunds and the dry acre 7. Now for the minimum food consumption of the population of North-Western Provinces and Oudh 185 millions of maunds are required; and this, on the above hypothesis, can be grown on 15 million irrigated acres. But allowance must be made, as before, for some crop being always raised on low-lying lands, in beds of streams, valleys, &c. (the area of which may be calculated at 2 million acres, raising at 7 maunds per acre 14 million maunds), and for some rain crop being harvested even in the worst season—say 14 or 16 millions more. The balance, or 160 millions, has to be raised on artificially irrigated land, and requires 12½ million acres. This is almost double the present securely irrigated area (excluding the "ponds and streams"), and it would require a very large extension of irrigation to effect such a result. In the Doab, however, it seems that the necessary provision will be made when the Lower Ganges canal is at work, and the whole canal system has attained its full development. The irrigated area of the Doab from canals and wells was 3,212,000 acres in 1876-77; the canal area had increased by 500,000 acres in 1878–79, and the Lower Ganges canal will probably add 600,000 acres more, so that the irrigated area will then be 4,300,000 acres, or more than the figure postulated in column 9 of the table in paragraph 3.

6. In that tract, therefore, the supply of food ought eventually to be sufficient for the inhabitants taken as a whole, though there will always be portions of it which have a deficiency and must buy from portions which have a surplus. In the rest of the province, however, not only is this consummation far from being reached, but there are no plans in existence which give any immediate prospect of its being attained.

7. Rohilkhand to be made safe from drought requires the extension of irrigation over about 1,400,000 acres; and it has been shown that there is no possibility of any large canal scheme here, and all that can be done is to utilise more effectually the small hill streams, and press on the construction of wells, which however, are of little use for the purpose of protecting the rice that is sown in 784,000 acres.

8. In Oudh about 1,700,000 acres have to be supplied with irrigation to secure the inhabitants from drought; the projected Sardah canal could irrigate about a million acres, but the fear of drought is not great enough to make the prospects of the financial success of this scheme at all encouraging.

9. In the eastern or Benares tract the deficiency is about the same as in Oudh, or 1,700,000 acres; but no canal has ever been planned there, and no severe drought has ever occurred. The trans-Jumna tract requires an additional supply of water for about 1,160,000 acres; and it is certain that, even if this could be given, it would take many years before the people would so change their agricultural habits as to utilise it.

10. Taking the province as a whole, it appears that there were, in 1876–77, 6,937,000 acres irrigated from canals and wells. To this may be added the increased canal area of 1878–79, 470,000 acres, making a total of 7,400,000 acres, which can be relied on in a year of drought to produce 96,000,000 maunds, or half the minimum food requirements of the country. There are further about four million acres of land irrigated from ponds, streams, &c., mostly low-lying and moist; at least half of this could be expected to produce, in a year of drought, a rabi crop equal to that on ordinary dry lands, or 14 million maunds. There would further be always something saved on kharif lands, even in the worst years, say 14 or 16 million maunds. Thus, even as matters now stand, the province may always

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be trusted to produce about 120 million maunds, or eight months' consumption for the whole population. For the remaining four months' consumption, as well as for seed grain and cattle food, they would have to trust to food-stocks and to importations from other provinces. It is generally reckoned that the food-stocks ordinarily held in the country amount, at a minimum, to three months' supply over and above the usual inter-harvest consumption; and therefore there is little fear but that the railways, which can easily throw in 5,000 or 6,000 tons a day by combined action from Bengal, the Punjab, the Central Provinces, and Rajputana, would be able to supplement the deficiency, if the calamity is confined to the North-Western Provinces, and the adjoining provinces are able to export their surplus stock.

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NOTE on WELLS by MR. E. C. BUCK.

The description of the province which has been given leads to the establishment of the important fact that a large per-centage of its area must be protected, if at all, by wells, and it becomes desirable, therefore, to place before the Famine Commission some account of the action which the North-Western Government has already taken in this direction, and also of the conditions, as far as they are at present understood, under which wells can be constructed.

The question of taking some decided steps for the encouragement of well construction was brought prominently forward early in 1877, when a circular was addressed by Government to selected officers of the revenue administration, desiring expression of opinion as to the measures which could best be adopted. Mr. Ricketts and Mr. Carmichael, members of the Board of Revenue, had already strongly urged the necessity of giving greater facilities to landowners for obtaining advances from Government for the purpose; and the question had also been raised whether, in the case of the refusal of village proprietors to construct wells (where required), either from their own funds or with funds placed in their hands by Government, it would not be the duty of the Government as supreme landlord to enforce the construction of them, and to recover the cost either by requiring the landowners to purchase the wells on reasonable terms, or by imposing a water-rate on those cultivators whose land would be irrigated. It must be understood that the proposition referred entirely to masonry wells, which only are sufficiently permanent and secure to justify Government interference.

The correspondence which resulted from the Government circular is forwarded to the Famine Commission with these replies, but is too voluminous to be inserted in this place, with the exception, however, of the final letter to the Government of India, which is quoted at the foot of this note, in order to explain what has been the action which Sir George Couper has definitely taken, as well as to bring to notice the difficulties which stand in the way of immediate progress on a large scale.

The most formidable obstacle is happily the one which can be most easily removed by the Government of India—namely, the difficulty of inducing landlords to take advances. There are a very large number of landowners and even of cultivators who would gladly construct wells if they could obtain capital on terms which, while remunerative to Government, would not hamper them as existing rules for granting advances now hamper them.

There is no room to doubt that the best machinery to employ for the construction of masonry wells is to be found in the agricultural community themselves, for three reasons. The first is that in any Government scheme of well-sinking the difficulty pointed out in Sir George Couper's letter has to be met, of ascertaining, in the case of each well, whether its construction will be useful and remunerative, and of making an inquiry controlled by an experienced officer in each individual instance before the well can be commenced; the second, that agricultural labour as well as material for construction can be procured by landowners at a much cheaper rate than by Government; and the third, that arrangements for enhancement of rent can be much more easily settled between the landlord and tenants than by Government.

It is therefore extremely desirable that liberal permission be awarded to the local Government to make advances for well construction wherever wells are required, and that the present unworkable system of rules should be superseded in favour of a system by which the local Government can, on its own responsibility, make advances on such terms as may be found to be acceptable to the people. If this policy is adopted, an immense impetus will be given to the irrigating power in the province.

But there is more than one reason why the measure above noticed will be found of itself insufficient. In the first place there are many tracts in which wells can and ought to be constructed, and in which the landowners, from apathy or other causes, will take no measures to construct them: and in such cases it becomes the duty of the supreme landlord to protect the land and those who cultivate it. In the second place there are localities, and not a few in number, in which engineering difficulties, too great to be met by rude native contrivances employed in well-sinking would be easily overcome by such scientific appliances as a Government department could supply; and thirdly, the object of Government in providing funds for building wells would not be gained unless it could be assured that the wells constructed were of a character which would guarantee permanent irrigation.

It is therefore necessary to adopt some extensive measures, independently of the agricultural community, in order to secure the object in view, and the question arises through what machinery those measures should be taken. It will be seen from the letter already quoted that the issues surrounding the construction of a well in a given spot are so numerous and so intricate that the knowledge necessary to decide where a well can or cannot be remuneratively made requires not only very special acquaintance with agricultural conditions, but a very great deal of local inquiry and investigation, and the need therefore for a special machinery to control the construction of wells, so far as they may be undertaken by Government, may be accepted, therefore, as beyond argument.

What, however, are the precise conditions under which Government machinery should control well construction is the problem which Sir George Couper has now required the Agricultural Department to work out, and an officer (Mr. Wright) is, during the present cold season, making, in communication with that department, a practical inquiry into the subject. This officer has been required to procure the construction of a certain number of wells, partly through the agency of zamindars and partly through Government agency, and in the meanwhile to provide all procurable statistics which may tend to provide a fuller knowledge of the economic and financial results of well construction than is now possessed. The field in which he is working is that part of the Cawnpore district which lies to the south-east of the canal system in the Doab belt. A similar inquiry is under contemplation in Oudh.

When the results of these preliminary inquiries are obtained, a scheme will be prepared for the adoption of general measures for the province, but whether these will take the form of a gradual advance from one district to another, or of simultaneous action throughout the province, has yet to be decided. It is not improbable that it may be found more economical as well as more effectual to complete one section of the country more or less thoroughly before commencing another, in order to avoid the dangers of extravagance and ineffectual work which are likely to attend sporadic measures.

However this may be, it has been practically decided by Government that complete arrangements shall be set on foot on an extensive scale for placing whatever permanent irrigation is available in the hands of the agricultural population, and the question has been raised by Sir George Couper whether it will not be necessary to organise a special machinery in connection with the Agricultural Department for the purpose.

The following are some of the leading problems which have to be solved:—

(1.) In what localities are wells required?
(2.) Will the landowners or tenants take an advance for their construction?
(3.) If not, how should wells be constructed by Government?
(4.) What will they cost?
(5.) What will be their remunerative effect?

Irrigation wells as constructed in these provinces may be divided into two main classes—namely, spring wells and percolation wells.

Throughout the greater part of the province there is found at a varying distance from the surface a stratum of clay, below which there is a full and practically permanent supply of water, and above which there is only a precarious amount derived from the rain-fall of the year which percolates through the upper strata. For this reason wells which reach water below the clay are called "spring wells," while those which only reach water above the clay are called "percolation wells." The above rule is not invariable, and especially fails near rivers, where it appears difficult and sometimes impossible to find the lower or permanent supply of water except by going to a very much greater depth than that at which spring water is usually found. Masonry wells are almost invariably constructed so as to reach the spring, partly in order that a full supply of water may be obtained, and partly in order that a firm substratum may be reached on which the well may rest. Earthen excavation wells, on the contrary, are ordinarily made only as far as the percolation water, because if they were taken lower down percolation water would drive in their sides at any point where the soil might be at all sandy or loose.

There are exceptions where the intervening strata are sufficiently stable to admit of a well without masonry being run down to the spring. But such cases cannot be said to be common.

Earthen wells, *i.e.*, excavations without masonry, are usually protected or lined at those places where sand strata are met with by cylinders of wood or coils of cotton stalks or some such material, which for a season or two prevents their giving way.

The following (a fair account of masonry-well irrigation in the Doab) is taken from the settlement report of the Mainpuri district by Mr. McConaghey, and illustrates not only the superiority of masonry over ordinary wells, but also the necessity for Government interference in obliging the agricultural community to build them:—*

"For masonry wells the first and essential condition is that a firm layer of subsoil should exist for the cylinder to rest on without fear of its further sinking. Unless this stratum is reached the well is a failure. The true spring is always found beneath this hard soil, which is called 'mota' or 'gharra,' and which varies in thickness in different places, but is never too deep when reached to render it impossible to be pierced. Through the opening made in this layer by a spear or iron stake the spring water confined by it rushes up from below in a continuous jet. This keeps the well full even when constantly worked. In such wells it matters little what different soil strata intervene. Once the cylinder is firmly deposited on the 'mota,' it can easily defy all pressure from without.

"But what is a matter of minor importance in the case of a 'pucka' (masonry) well may be most destructive to a 'kucha' (earthen) well. What we have to consider in the latter is—

"(1.) The existence or absence of a constant supply;
"(2.) The facility or difficulty of getting at this supply; and
"(3.) The means of maintaining communication with the source of the supply.

"As just observed, a masonry well is considered a failure unless the spring is reached; but in many kucha wells where the 'mota' is distant and the subsoil bad, it is impossible to keep the sides from collapsing before the spring is tapped.

"The owner of the well is therefore obliged to content himself with the supply from percolation, which is of course much less constant and abundant than from the spring. A percolation well often contains enough water to keep a pair of bullocks busy at its run; but many of them (particularly in the great northern sand tract) get exhausted so quickly, and are besides so fragile, that resort to even wells worked by hand is rendered necessary. Fortunately in this part of the country water is close enough to the surface to admit of even well irrigation.

"The masonry wells in good repair throughout the district number 7,282. Of these, 6,463, with 15,203 buckets, are in constant use. The kucha wells in working order during the years of survey were 54,895, with 62,171 buckets. The runs or laos are therefore 77,374 in all, or about one for every four acres habitually irrigated.

"If statistics, former and present, can be relied on—and we can see no reason to doubt their accuracy—there has been a considerable falling off in the number of masonry wells within the past thirty years. This decrease is not confined to tracts which have been brought within the influence of the canal, but is almost universal throughout the district.

"At last settlement, over the district as then constituted, containing an area of 1,280,923 acres, there were 11,186 'pucka' wells in use, with 27,471 laos. In 1848–49, over the same area, the wells had decreased to 9,170, and the runs to 23,590. At present, over an area of 1,086,253 acres, there are 7,282 masonry wells in good repair, 6,463 of which, with 15,203 laos, are used for irrigation.

"Irrigation has not decreased—on the contrary it has been largely extended; nevertheless, the tendency to replace 'pucka' wells, as they fall out of repair, by 'kucha' ones, or to resort to canal irrigation instead, is manifest.

"The reluctance to invest capital largely in wells is therefore an established fact; why it is so is difficult to determine.

"New masonry wells must be constructed either at the expense of the proprietors or the cultivators. The

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* Mr. Reid, Settlement Officer of Azamgarh, writes of that district:—

"In the higher lands of the district water is met at from 12 to 20 feet from the surface in the dry months of the year, and in the rainy season at a still higher level. But wells that depend upon lateral filtration are very soon exhausted. The beds in which permanent bottom springs are struck are clay, not unfrequently mixed with kankar. They lie below the ordinary water-level, but their distance from it varies much in different localities. In some places they are little below the water-level of the dry season; in others the people seem to be unable to bore deep enough to reach them. In some places the supply of water is so bountiful that, the bed once tapped, it is very difficult to empty the well; in others the supply is less abundant. To reach the spring-level several different deposits have probably to be dug through. If these are all beds of firm material, the well-maker's work is easy, and a well which is not protected by a masonry shaft will last nearly as long as one that is. There are, however, few such happy localities in this district. Almost invariably one or more beds of sand or light earth must be traversed before the spring-level is come to. Even when these sandy beds are some feet above the water-level in the dry months, the rise of the water-level during the rainy season is almost sure to affect the stability of wells; and wells that are not lined with masonry generally fall in at that period of the year."

The water-level.

The spring-level.

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new zamindars whom our laws have created, and who now hold so much of the land are, as a rule, disinclined to sink money in such improvements. They transfer the responsibility to cultivators, and their sole object seems to be to take as much out of the land as they can, and to spend as little on it as possible; whilst the majority of the old proprietors are unable to set aside large sums out of their incomes for such improvements.

"The cultivators on the other hand, on whose shoulders the responsibility has to a great extent been laid, had not till recently sufficient permanent interest in the land to encourage them to sink their savings in the construction of masonry wells, and they accordingly preferred the easier and less costly method. Before revenue and judicial sales were permitted, the hereditary tillers of the soil were seldom compelled to relinquish their paternal acres. Their general circumstances may have been, and undoubtedly were, worse than they are now. In seasons of drought and famine they suffered frightfully; but in seasons of plenty they had every inducement to invest their savings in improving their property and laying up a provision to meet future calamity.

"A masonry well was then, next to their land, the most valuable possession they had. It gave its return in increased produce, and could not be touched by the rapacity of the underlings of the Government."

The relation which the cost of a masonry well bears to the value of the water which it provides varies under different circumstances, and must be the subject of separate inquiry in each locality; an attempt can, however, be made to give some indication of the return which may be obtained for outlay on masonry wells in the lower Doab. It is proved that on an improved method of construction a masonry well containing two buckets (*i.e.*, which can be worked by two pairs of bullocks at one time) can be constructed to a depth of 30 feet for Rs. 250 by professional engineers. The area which such a well will command, *i.e.*, of which it will irrigate one-half at any one season, is at least 20 acres. It is also an ascertained fact that any land which can be occasionally manured can readily pay an increased rent of Re. 1-8-0 an acre if provided with water. This is indeed a low enhancement. The outlay of Rs. 250 can therefore be made to bring an annual return of Rs. 30, *i.e.*, 12 per cent. Mr. Wright's experiments, to which allusion has already been made, tend to prove that, even under professional agency, the cost of such a well may be brought down perhaps to Rs. 200, while if the construction is undertaken by the agricultural community the cost will be still less. There is therefore *primâ facie* reason to believe that masonry wells of the depth indicated may be constructed on far more remunerative terms in the lower Doab than canals, and that from a financial point of view it will be in the interests of Government to make large grants for expenditure on well irrigation there.

In a well of which the masonry is sunk to 30 feet water will lie at about 20 feet, since it is essential that the masonry sides should be 10 feet below the surface of the water. It is probable that in the sub-Himalayan and Rohilkhand belts it will seldom be necessary, except in the vicinity of large rivers, to exceed 30 feet of masonry, since water seldom falls so low as 20 feet; but on the other hand irrigation in ordinary years is, so easily obtainable from rivers, tanks, lakes, and earthen wells, that it is doubtful whether water has the same rental value as in the Doab. Land which would be irrigated from any masonry wells that might be constructed is already sufficiently "irrigable" in ordinary years, and pays already a rent based on this fact. This consideration will reduce the profits on outlay, but how far it will do so can only be decided by scientific inquiry, which must be made. Again in the Doab water is constantly at a greater depth than 20 feet; 30 feet is probably a safer average, and 30 feet requires masonry of 40 feet, and an outlay, under professional agency, for a two-bucket well, of about Rs. 300. Water however, is so much required in the Doab that even at this depth an enhanced rent will be paid which gives a return of 8 or 9 per cent. on the outlay.

It must never be forgotten, in dealing with well irrigation, that in proportion to the depth from which water is lifted so is the area for which water will be taken restricted, not only because less water is raised in the same time, and therefore a smaller area irrigated in one day, but also because on account of greater labour and expense the cultivator will only consent to irrigate land of good quality or well manured. It becomes, therefore, a very important object to obtain some more effective and economical method of raising water than now exists. English pumps are too complicated and expensive for India, and a cheap simple machine must be formed which can be constructed or at least repaired by the village blacksmith. The Agricultural Department is carrying out a series of experiments with a view of obtaining a cheaper and better water-lift, and some promising results have already been obtained by a cheaply constructed hand pump adapted from an Australian pump brought out by Mr. Buck three years ago from Melbourne. The question is one, however, which deserves to be studied by the best engineering ability in the country. It seems difficult to believe that the problem cannot be solved of raising water from a depth of 20 or 30 feet at a cheaper rate than if brought two or three hundred miles from the foot of the Himalayas, and it seems equally difficult to understand why no movement has hitherto been made to direct the rich engineering talent which the country possesses towards its solution.

There is a separate but not unimportant object in providing the agricultural population with pumps worked by hand. Cattle power fails rapidly in a season of drought, and in a year of continued failure of rain may become quite unequal to afford any material protection. A system by which water could be economically raised by hand becomes at such a time far more useful to the country than one which depends on bullocks. Mr. Buck's experiments tend to show that water can be raised from a depth of 15 feet, with the pump above noticed, at half the expense of the labour now used in lifting water by baskets from tanks and ponds. Now it is proved that with three feet basket-lifts six men can irrigate one acre a day, and that one man's irrigating power is therefore one-sixth of an acre a day from three feet. This rate gives one-thirtieth of an acre for 15 feet, or one acre in 30 days. To save a crop in extreme drought one acre must possibly be watered once in 14 days, though in ordinary seasons it does not want more than one watering in six weeks.

At a rough estimate, therefore, one man's labour could save a crop on half an acre, or about 400 lb. of grain each season, or 800 lb. of grain in all. Of carrots a very much larger weight could be saved (as shown in Mr. Buck's note on carrots as a famine crop); two men could therefore probably irrigate enough land to give food to five persons, which would practically be food for the whole family.

The above statement is intended not so much to assert that the figures brought forward are proved facts as to indicate in what direction experiments are being and ought to continue to be made. It is sufficient at present to say in conclusion that there is no subject which has engaged the practical consideration of the North-Western Provinces Government more than that of well irrigation.

There are other possible means of obtaining irrigation, such as raising water from snow-fed rivers either by steam, or by scientific pumps; concentrating small streams into rice tracts in the rainy season; constructing small canals from small rivers at different points of their course, conserving rain-fall, &c., which will be studied at the same time that well construction is taken in hand, but it will be premature to assert now how far these subsidiary means of irrigation can be brought into action.

APPENDIX A.

No. 3503A., dated Camp Lucknow, the 2nd December, 1878.

From C. ROBERTSON, ESQ., *Secretary to Government, North-Western Provinces and Oudh, to Secretary to Government of India, Department of Revenue, Agriculture, and Commerce.*

SIR,—I am directed to submit, for the information of His Excellency the Governor-General in Council, a copy of the papers noted below*, on the subject of constructing wells at the expense of the State as a protection from drought, and, to communicate the following remarks.

2. The prominent features of the voluminous notes and suggestions which have been placed before his Honor on the subject appear to be a very great diversity of opinion as to the amount of pressure which it may be necessary to place upon the agricultural population to induce them to construct wells, much doubtful conjecture as to the method and cost of well construction, and almost complete ignorance both as to the extent to which wells are required and as to the localities in which they are most urgently needed.

3. There are no sufficient data to enable His Honor to place before the Government of India any approximately definite figures, either of the extent to which the public funds would be called upon, under the provisions of any Bill which might now be drawn up, to subscribe to the construction of wells, or of the financial results which would be involved either to Government or to the subordinate landlords of the country, upon whom it is practically proposed to lay the chief burden of risk and expenditure.

4. Under these circumstances His Honor cannot but hesitate to bring forward any final proposition which can be made the foundation of a measure by which the agricultural interests of the whole province must be largely affected, either for good or for evil. Experience has proved the danger of launching into any scheme, however benevolent in intention or plausible in theory, without a careful and practical investigation of the facts by which it is surrounded. It is sufficient to refer to canals—and some such there are—which ought never to have been constructed, and to defray the cost of which the agriculture wealth of the country has been drained, in order to prove the necessity of avoiding such hasty action as may lead to similar results in the general construction of wells. And His Honor fears that any hasty action taken under present circumstances for the general construction of wells would but add to the number of well-intended but unprofitable projects. In the famine of 1838–39 it was considered wise to utilise starving labour in many parts of the country for the excavation of tanks. Tanks were dug, but they have been dry ever since.

5. It is one thing to say that a well of a certain kind—costing a certain sum of money, constructed in a certain place, and utilised by a certain set of cultivators on a certain class of soil for the production of certain crops—would or could pay so much rental to the landlord and so much revenue to Government, and another thing to say that such wells can be built at the same cost in many places, and utilised to the same advantage by every class of cultivator under every diversity of condition. It seems to His Honor that not a single well should be built under pressure from Government until Government is thoroughly assured of the benefits which will result from its construction; and His Honor is completely convinced that no assurance can possibly be furnished until the most careful study has been made of the special circumstances of the locality in which it is to be constructed.

6. The Board of Revenue have in their draft Bill proposed to give the Collector of each district authority to construct wells primarily at the cost of the Exchequer, and finally at the cost of the agricultural population, wherever and whenever they may choose to do so. His Honor need make no other reference than to the replies received to the Famine Commission queries to prove the extreme danger of such a proposition. Without entering into a discussion of the causes which have led, and will even under improved administration for some time continue to lead to such a result, the fact is absolutely certain that district officials are practically unacquainted with the agricultural circumstances of the land, and that they certainly have no time now to learn them. A long experience in the review of settlement operations and reports has, on the other hand, left no stronger impression upon the mind of His Honor than that which induces him to believe that a close and personal inspection of each locality and ascertainment of its condition is the only safe basis upon which to form any proper decision as to its agricultural requirements; and that (more than this) an intimate acquaintance with the requirements of one locality, derived though it be from personal inspection and inquiry, is no safe guide to a knowledge of the needs of another even in the same neighbourhood. Now His Honor cannot conceive any section of agricultural operations which in this country depends upon more numerous or more intricate conditions, both above the ground and under the ground, than that of well irrigation.

The depth at which water will be reached; the depth of water when reached; the abundance of the supply; the condition of strata to be penetrated or in which water lies; the character of the water itself; the cost and supply of material and labour in each locality; the size of well most adapted to the place; the nature of the soil to be irrigated; the kind of crops which can be raised; the class of cultivators by whom it will be utilised; the relations, amicable or otherwise, which they bear to each other and to their landlords; the distance which water has to be taken from the well; the extent to which irrigation is already available in the neighbourhood—every one of these questions (and His Honor cannot pretend to enumerate all that will arise) should in His Honor's opinion be made in each case the subject of special inquiry before sanction ought to be given to the construction of a single well, either at public expense or under official pressure. With this conviction His Honor must record that he is decidedly opposed to the adoption of any legislative measure which will give authority for the construction of wells, except under the most careful provisions for local inquiry by competent and special agency.

7. His Honor is inclined to proceed with even greater caution. In consideration of the large financial interests which must be concerned in any scheme for well construction (how large it is impossible now to predicate), the wisdom of issuing any definite laws or rules under which the scheme shall be worked, until the conditions by which it is surrounded and upon which it is to be framed have been to some extent ascertained, seems very doubtful. In His Honor's opinion the safest course will therefore be to commit the investigation of the circumstances of one or more tracts to a staff of specially selected officers, from whose inquiries more definite ideas may be gained, both as to the financial results which are likely to ensue, and as to the best method of executive procedure; and at the same time to entrust them with authority and funds for the construction of a limited number of wells. His Honor suggests that such preliminary action should be taken at the cost of provincial funds.

8. The views to which His Honor has given expression on the necessity of local investigation by a special staff must, if accepted as the basis of future legislation, lead to the establishment of a separate agency, whose principal duty it will be to study the

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* From Secretary, Board of Revenue, North-Western Provinces, to Secretary to Government, North-Western Provinces and Oudh, No. $\frac{\text{1827N.}}{\text{IV.–B.–31}}$, dated 6th September, 1878, with enclosures and accompaniments.

From ditto to ditto, $\frac{\text{No. 1828N.}}{\text{IV.–B.–31.}}$, dated 6th September.

From Under-Secretary to Government, North-Western Provinces and Oudh, in the Public Works Department, No. 1570A-C., dated 19th October, 1878.

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agricultural circumstances of each locality in which it is proposed to construct wells, or rather whose principal duty it will be to study the agricultural circumstances of every locality not fully irrigated, in order to decide whether or not wells are there required. The question then arises whether the results which will be obtained will justify the expenditure. At present (*i.e.*, until the experimental inquiry which His Honor proposes has been carried out) the amount of expenditure cannot be accurately gauged; but His Honor conceives that local inspection could not be effected at a very much more rapid rate than local inspection for settlement purposes in any set of villages in which wells are required, in which details arrangements have to be made. Taking settlement data as a guide, His Honor doubts if, under a village to village inspection, any district could be thoroughly worked by one officer in less than two or three years (some would take more,) and His Honor hesitates to estimate the expenditure which would be thus entailed. Roughly, it may be from Rs. 25,000 to Rs. 50,000 per district,—an administrative charge which would in His Honor's opinion have to be borne by the country at large in the capacity of supreme landlord, and not (as one of the items in the construction of wells) by subordinate landlords.

It would be useless to say that the expenditure can be avoided by asking district officials to do the work, even had they the knowledge and aptitude required for the duty, since, under present circumstances, they have no time whatever for local inspections of the kind contemplated.

9. If then it is decided that Government is bound, in defending the country against famine, to establish a scheme for the general construction of wells, and the argument is also accepted that no scheme can be adopted which does not involve local inspection by a special staff, it follows that a large expenditure must be incurred over and above the ordinary charges for construction.

10. In considering the important issue thus involved, the question naturally suggests itself whether such expenditure can be simultaneously utilised in any other direction. There is, on the one hand, almost universal ignorance of the agricultural circumstances of the country and its cultivators, and on the other, a special staff employed in ascertaining them for the purpose of deciding whether or not they justify the construction of wells. Are there no other questions to the elucidation of which their inquiries can be made to tend? There are of course many, and it would perhaps be more difficult to restrict than to extend their number; but what, from a financial point of view is more to the purpose, there are some duties now imperfectly performed by district officials, on account of the impossibility of their obtaining that very knowledge of local circumstances necessary to their proper performance, which could be far more perfectly acquitted by special officers studying the conditions of each separate tract. The utilisation of their services in such duties would probably enable Government, with little expense to the administration, to draft some of the existing revenue staff for the special duty of local inspection. Prominent among duties of the nature referred to is that of enhancing and determining tenants' rates, and if (as was once wisely proposed) the rental assessments of each tract were disposed of at one time in each tract for a series of years, the harassing work now thrown upon revenue officials, of deciding rates in every corner of the district in the same season, upon data of which they are in a great measure ignorant, would be swept away, and far more justice would be done to the agricultural population than is now the case. An attempt was made a few years ago to meet the difficulty by appointing from year to year a special officer in each district to undertake rent assessments, but the experiment has failed for obvious reasons, the most obvious being that it is impossible for successive officers to obtain intimate acquaintance with the local conditions surrounding each case in so large an area as a whole district. The above instance has been brought forward by His Honor to prove that expenditure can be defrayed, at least in part, by throwing upon a special staff much work now imperfectly done by the general staff; but it is at the same time clear that many other results can be obtained in directions in which little work at all is now effected, but which are of great importance to the administration, such as the collection of facts relating to the debts and financial position of the cultivating community. It is, however, unnecessary to dwell further at this time upon questions which will, if the experimental trial proposed by His Honor is carried out, be the subject of more mature consideration in any final proposals which may be based upon its results, and it is sufficient to indicate that inquiries necessary for a general scheme for well construction can be profitably utilised in other directions of equal importance.

11. The proposals which His Honor now desires to make are these—

(*a.*) Two tracts, in which there are *primâ facie* reasons for believing that wells can be constructed at a reasonable cost with advantage to the agricultural community, will be chosen in different parts of the province.

(*b.*) They will also be such as contain one or more villages under Government management.

(*c.*) A special officer will be employed in each to make a thorough examination of the country, and to decide for each village in the tract whether or not wells can be advantageously constructed.

(*d.*) If, as inquiry progresses, it is ascertained that wells may be advantageously made by Government agency, a sufficient engineering staff will be placed at his disposal on such terms as the local Government may consider desirable.

(*e.*) Takávi advances will be granted in all cases where the agricultural communities are willing to accept them.

(*f.*) In other cases, in which the consent of those who possess interest in the land may be obtained, wells will be constructed by Government agency, and a well rate charged on land to be irrigated from them.

(*g.*) In villages under Government management (no consent being required) wells will be constructed by Government agency, and a well rate charged as above.

(*h.*) The object of the experiment being to ascertain the best and most economical plan to be adopted, no precise rules will now be laid down as to the method to be followed in constructing wells.

(*i.*) The provincial department of agriculture will be required to exercise a general superintendence over operations, to consult with the local Government and with the officers employed as to the different methods which should be tested, and to review from time to time, for the information of Government, the progress which may be made or the difficulties which may arise.

(*j.*) *Pari passu* with other proceedings, the officers employed will, so far as they have leisure, be utilised in making special investigations into agricultural circumstances of which at present imperfect knowledge exists (such as those which are now the subject of inquiry by the Famine Commission, *e.g.*, the produce of land, the cost of irrigation, the indebtedness of cultivators, &c.): such investigations will dovetail naturally in with those which are essential for ascertaining the desirability of constructing wells.

(*k.*) At the conclusion of the season a report on obtained results will be required, which may be found sufficient to indicate in what direction legislation is required, as well as the probable financial results of extending the system throughout the provinces. It is, however, likely that, since few wells can be constructed in time for the irrigation of this year, a sufficient report cannot be obtained until the end of next cold weather.

12. In carrying out the above programme it does not appear necessary for His Honor to ask the Government of India for assistance, except in the

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matter of extending the rules under the Takávi Act in such a way as to enable advances to be made on less troublesome terms than those which now exist. A change is so essential that, unless it is effected, His Honor fears that little result will be obtained from the proposed experiments. The changes which His Honor desires to see made, and which, it will be understood, require no fresh legislation, are contained in an appendix to this letter.

13. Pending the consideration of the whole subject of general legislation by the Government of India for enforcing the construction of wells, and of the various issues which are raised in connection with the subject, it is the intention of His Honor to lose no time in setting on foot the operations explained in the above programme. Meanwhile His Honor urgently solicits immediate orders on the question of extending the takávi rules, and suggests that if the Government of India are not prepared at present to commit themselves to any general alteration of the rules, special license be granted in the present case for offering advances on more liberal terms.

PROPOSED RULE FOR ADVANCES.

Appendix to G. O. No. 3,503A, dated 2nd December 1878.

I.—In the case of advances given for the construction of masonry wells by the officer specially deputed by the Government of the North-Western Provinces to inquire into the necessity of providing the means of irrigation as a protection from drought, rules 19, 20, 21, 22, and 25 of the Rules for giving effect to the Land Improvement Act (XXVI. of 1871) in the North-Western Provinces and Oudh are suspended.

II.—In the district or part of a district in which such inquiry is being conducted, applications for advances for the making of masonry wells may be presented on plain paper; and all instruments executed by persons taking advances for such a purpose, or by their sureties, as security for the repayment of the same, are exempted from stamp duty.

III.—The amount advanced shall be recoverable by equal annual instalments, the first of which shall fall due one year after the completion of the well made with the advance, and the amount of which shall be determined, so that at the expiry of the current settlement of land revenue the whole of the principal, with interest at 4½ per cent. per annum, shall have been recovered.

IV.—In lieu of other security the officer authorised to make advances may accept the hypothecation of the enhanced rents payable for the land to be irrigated from the well for which the advance is given, or of a part thereof, or may make such other arrangement as he finds advisable and is approved by the local Government, provided he is satisfied that there is reasonable security for the repayment of the advance.

STATEMENT I.—Showing IRRIGABLE and IRRIGATED AREA.

	1.	2.	3.	4.	5.		6.		7.		8.		9.	10.
DISTRICT.	Total Cultivated Area.	Total Cultivated Area Irrigable.	Per-centage of Irrigable Area on Total Cultivated Area.	Total Crop Area.	Total Crop Area Irrigated in the year 1876–77.								Grand Total of Irrigated Area.	Per-centage of Irrigated Area on Total Area under Crops.
					Canals.		Wells.		Others.		Total.			
					Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
	N.B.—The figures (except in columns 3 and 10) represent thousands.													
N. W. PROVINCES.														
Meerut Division.														
Saharanpur	825	190	23	895	37	38	11	30	1	2	49	70	119	13
Muzaffarnagar	700	323	46	737	57	77	33	40	1	3	91	120	211	29
Meerut	1,050	578	55	1,150	97	144	57	91	2	6	156	241	397	33
Bulandshahr	850	420	49	918	48	77	51	116	2	5	101	198	299	32
Aligarh	950	730	70	1,050	38	65	167	297	2	5	207	367	574	55
Total Meerut Division	4,375	2,241	51	4,750	277	401	319	574	8	21	604	996	1,600	33
Rohilkhand Division.														
Bijnor	650	50	7	700	4	3	6	4	9	3	16	10	26	4
Moradabad	900	436	48	954	—	—	60	100	30	50	90	150	240	25
Bareilly	1,160	420	35	1,270	—	—	60	86	26	40	86	126	212	16
Budaun	840	200	35	890	—	—	13	95	6	45	19	140	159	18
Shahjahanpur	740	350	47	780	—	—	32	104	16	50	48	154	202	26
Tarai	130	50	38	160	2	3	—	—	1	1	3	4	7	4
Total Rohilkhand Division	4,420	1,606	36	4,754	6	6	171	389	85	189	262	584	846	17
Agra Division.														
Muttra	660	380	60	730	5	9	5	139	1	5	11	153	164	23
Agra	1,050	520	58	1,110	16	30	59	222	5	9	80	261	341	36
Mainpuri	608	450	74	648	22	61	25	167	4	21	51	249	300	47
Farakhabad	670	380	60	707	12	27	18	126	3	25	33	178	211	32
Etawah	550	360	65	615	32	74	11	49	2	5	45	128	173	30
Etah	620	350	56	660	7	14	34	143	3	9	44	166	210	31
Total Agra Division	4,158	2,440	62	4,470	94	215	152	846	18	74	264	1,135	1,399	33

HAP. I. Qn. 4.

NORTH-WEST PROVINCES AND OUDH.

Mr. Buck.

STATEMENT I.—Showing IRRIGABLE and IRRIGATED AREA—*concluded.*

DISTRICT.	1.	2.	3.	4.	5.		6.		7.		8.		9.	10.
	Total Cultivated Area.	Total Cutivated Area Irrigable.	Per-centage of Irrigable Area on Total Cultivated Area.	Total Crop Area.	Total Crop Area Irrigated in the year 1876–77.								Grand Total of Irrigated Area.	Per-centage of Irrigated Area on Total Area under Crops.
					Canals.		Wells.		Others.		Total.			
					Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.		
	N.B.—The figures (except in columns 3 and 10) represent thousands.													
Allahabad Division.														
Cawnpore	850	560	56	910	41	103	54	169	15	20	110	292	402	44
Fatehpur	545	290	53	585	—	—	42	74	38	78	80	152	232	39
Banda	780	8	1	805	—	—	—	1	1	3	1	4	5	—
Allahabad	1,030	400	38	1,105	—	—	46	92	54	108	100	200	300	27
Hamirpur	750	15	2	779	—	—	—	2	1	6	1	8	9	1
Jaunpur	580	480	83	600	—	—	60	185	60	85	120	270	390	65
Total Allahabad Division	4,535	1,753	38	4,784	41	103	202	523	169	300	412	926	1,338	28
Benares Division.														
Azamgarh	936	660	70	1,004	—	—	40	158	52	210	92	368	460	45
Mirzapur	950	250	26	990	—	—	20	30	80	102	100	132	232	23
Benares	485	300	62	510	—	—	26	84	13	77	39	161	200	39
Gorakhpur	2,000	900	45	2,150	—	—	184	244	95	120	279	364	643	30
Basti	1,250	600	48	1,350	—	—	110	144	54	72	164	216	380	28
Ghazipur	990	640	64	1,060	—	—	96	124	101	119	197	243	440	41
Total Benares Division	6,611	3,350	44	7,064	—	—	476	784	395	700	871	1,484	2,355	33
Jhansi Division.														
Jalaun	580	20	3	600	—	—	—	7	3	1	3	8	11	2
Jhansi	350	25	7	360	—	—	—	19	1	2	1	21	22	7
Lalitpur	242	30	12	250	—	—	—	18	1	2	1	20	21	8
Total Jhansi Division	1,172	75	6	1,210	—	—	—	44	5	5	5	49	54	4
Hill Tracts.														
Dehra Dun	73	29	39	77	3	2	—	—	4	12	7	14	21	27
Kumaun	327	75	23	551	28	30	—	—	2	10	30	40	70	13
Garhwal	120	8	6	200	—	—	—	—	—	3	—	3	3	1
Total Hill Tracts	520	112	21	828	31	32	—	—	6	25	37	57	94	11
Provincial Total N. W. P.	25,791	11,577	37	27,860	449	757	1,320	3,160	686	1,314	2,455	5,231	7,686	23
OUDH.														
Lucknow Division.														
Lucknow	332	200	60	382	—		80		90		—		170	45
Bara Banki	718	500	69	788	—		100		300		—		400	51
Unao	596	400	67	648	—		100		200		—		300	46
Total Lucknow Division	1,646	1,100	66	1,818	—		280		590		—		870	48
Fyzabad Division.														
Fyzabad	607	400	66	655	—		154		196		—		350	54
Bahraich	801	300	38	883	—		21		38		—		59	7
Gonda	1,017	300	28	1,170	—		69		138		—		207	18
Total Fyzabad Division	2,478	1,000	40	2,708	—		244		372		—		616	23
Sitapur Division.														
Sitapur	917	200	22	1,011	—		65		85		—		150	14
Hardoi	863	300	34	920	—		100		160		—		260	28
Kheri	805	200	25	865	—		35		65		—		100	12
Total Sitapur Division	2,585	700	28	2,796	—		200		310		—		510	18
Rae Bareli Division.														
Rae Bareli	570	450	80	620	—		190		210		—		400	64
Sultanpur	572	550	96	622	—		220		280		—		500	80
Partabgarh	448	420	93	493	—		180		220		—		400	81
Total Rae Bareli Division	1,590	1,420	89	1,735	—		590		710		—		1,300	75
Provincial Total Oudh	8,299	4,220	50	9,057	—		1,314		1,982		—		3,296	36
Grand Total N. W. P. and Oudh	34,090	15,797	43	36,917	1,206		5,794		3,982		—		10,982	30

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NORTH-WES
PROVINCES
AND OUDH,
Mr. Buck.

STATEMENT No. II., showing CANAL IRRIGATION (in Acres) by DISTRICTS in the NORTH-WESTERN PROVINCES,

istricts.	1868-69.			1869-70.			1870-71.			1871-72.			1872-73.			1873-74.			1874-75.			1875-76.			1876-77.			1877-78.			Average over ten years.	1878-79.		
	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.	Kharif.	Rabi.	Year.		Kharif.	Rabi.	Year.
Saharanpur -	48,620	99,672	148,292	58,456	48,853	107,309	47,904	40,092	87,996	32,834	35,045	67,879	,098	33,417	72,515	33,901	31,236	65,137	34,949	34,961	69,910	41,029	33,831	74,860	36,816	37,724	74,540	46,671	68,776	115,447	88,388	46,045	66,353	112,398
Muzuffarnagar	63,726	240,433	304,159	74,126	72,397	146,523	59,097	77,686	136,783	45,804	73,572	119,376	50,552	61,042	111,594	49,221	66,834	116,055	45,405	69,351	114,756	61,880	68,728	130,608	57,177	77,093	134,270	76,195	81,694	157,889	147,201	80,169	103,863	184,032
Meerut - -	106,904	101,257	208,161	113,036	143,958	256,994	84,998	156,127	241,125	71,866	121,827	193,693	68,497	109,984	178,481	78,084	105,231	183,315	68,276	119,302	187,578	85,129	126,642	211,771	97,015	144,101	241,116	132,215	102,728	234,943	213,718	128,401	206,473	334,874
Bulandshahr -	45,583	110,037	155,620	64,388	69,025	133,413	42,242	79,729	121,968	35,613	59,202	94,815	39,758	66,345	106,103	50,665	66,233	116,898	66,360	71,356	137,716	45,388	70,919	116,307	47,447	77,318	124,765	85,712	66,956	152,668	126,027	96,202	137,870	234,072
Aligarh - -	46,351	82,574	128,925	55,990	59,947	115,937	44,871	68,010	112,881	46,202	47,767	93,969	40,070	51,063	91,133	41,597	63,495	105,092	39,751	74,978	114,729	38,949	70,419	109,368	38,414	64,862	103,276	70,486	71,527	142,013	111,732	64,291	95,548	159,839
Muttra - -	8,772	14,539	23,311	7,689	10,942	18,631	7,339	12,424	19,763	6,497	10,478	16,975	6,412	13,243	19,655	6,136	393	6,529	8	3,766	3,774	2,137	8,167	10,304	5,436	9,345	14,781	18,906	35,953	54,859	18,858	17,379	32,934	50,313
Agra -	812	1,029	1,841	587	845	1,432	525	959	1,484	599	962	1,561	589	2,169	2,758	513	13,121	13,634	7,279	22,703	29,982	10,049	23,182	33,231	15,822	30,094	45,916	35,573	53,279	88,852	22,069	21,807	36,631	58,438
Etah - -	12,985	22,768	35,753	12,041	17,755	29,796	10,151	18,306	28,457	11,716	14,863	26,579	8,433	15,775	24,208	9,537	19,589	29,126	8,277	20,582	28,859	8,382	17,869	26,251	6,776	13,775	20,551	14,733	15,910	30,643	28,022	9,976	37,052	47,028
Mainpuri -	31,961	66,554	98,515	17,810	39,123	56,933	15,000	45,101	60,101	13,596	33,501	47,097	16,542	49,171	65,713	20,112	57,987	78,099	22,613	74,487	97,100	24,783	70,784	95,567	22,092	61,193	83,285	47,601	44,318	91,919	77,433	39,711	63,556	103,267
Farakhabad -	14,296	29,905	44,201	11,102	12,812	23,914	8,303	18,655	26,958	6,633	13,112	19,745	9,159	21,811	30,970	9,485	25,589	35,074	11,988	30,388	42,376	13,876	27,115	40,991	12,514	27,239	39,753	24,632	17,943	42,575	34,656	19,039	28,189	47,228
Etawah - -	33,083	55,108	88,191	17,218	38,492	55,710	17,200	49,666	66,866	15,106	35,565	50,671	20,390	59,316	79,706	25,875	74,185	100,060	27,246	85,418	112,664	31,782	78,417	102,199	32,245	73,645	105,890	58,762	43,147	101,909	86,387	43,193	71,231	114,424
Cawnpore -	32,911	73,301	106,212	28,566	56,315	84,881	27,158	47,784	74,942	18,625	48,315	66,940	27,389	59,091	86,480	33,147	81,149	114,296	39,276	102,300	141,576	44,531	98,466	142,997	41,389	102,904	144,293	74,171	78,522	152,693	111,530	56,438	96,477	152,915
Delhi, Agra Canal.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	37	37	20	46	66	4	22	26	150	190	340	116*	83	587	672
Gurgaon, Agra Canal.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	9,410	9,410	2,167	7,388	9,555	4,847	10,264	15,111	16,790	31,838	48,628	20,626*	11,828	29,447	41,275
Dun - -	4,144	9,810	13,954	4,247	6,182	10,429	4,655	7,763	12,418	5,535	5,504	11,039	5,217	8,785	14,002	6,182	6,862	13,044	5,595	10,020	15,615	6,243	6,156	12,399	5,726	6,869	12,595	4,979	7,381	12,360	12,785	3,597	9,607	13,204
Bijnor - -	146	1,509	1,655	1,060	316	1,376	554	1,880	2,434	1,113	522	1,635	1,246	2,159	3,405	2,680	769	3,449	918	1,392	2,310	1,169	1,876	3,045	2,721	1,711	4,432	648	1,475	2,123	2,586	—	1,283	1,283
Tarai - -	3,622	4,573	8,195	2,986	1,398	4,384	2,700	1,608	4,308	1,370	708	2,078	3,449	3,065	6,514	4,362	3,123	7,485	3,449	2,472	5,921	3,552	4,901	8,453	3,655	2,637	6,292	1,795	292	2,087	5,571	1,528	3,941	5,469
Bareli - -	29,319	29,398	58,717	31,646	9,403	41,010	25,037	26,888	51,925	19,700	17,519	37,252	16,507	29,222	45,729	29,641	30,359	60,000	7,995	17,810	25,805	8,474	41,838	50,312	33,181	34,846	68,207	21,277	6,712	27,989	46,697	20,151	53,296	73,447
Jhansi -	—	—	—	34	88	122	12	141	153	8	172	180	21	420	441	39	560	599	50	717	767	45	408	453	28	254	282	29	445	474	386†	85	586	671
Hamirpur -	—	—	—	643	197	840	406	387	793	297	707	1,004	290	880	1,170	399	1,021	1,420	271	1,122	1,393	199	1,251	1,450	225	457	682	260	757	1,017	1,085†	105	1,026	1,129
Total -	483,235	942,467	1,425,702	501,625	588,048	1,089,673	398,152	653,203	1,051,355	333,117	519,372	852,489	353,619	586,958	940,577	401,576	647,736	1,049,312	389,706	752,572	1,142,278	429,784	758,403	1,188,187	463,530	776,353	1,239,883	731,585	729,843	1,461,428	1,155,873	660,026	1,075,952	1,735,978

* For four years only.

† For nine years.

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Bengal.

Mr. Toynbee.

BENGAL.

The only figures available for this province, to show the area commanded by wells, tanks, and other private sources of irrigation, are those given in the Return XLIB, referred to in the answer to Question 3. In the absence of regular detailed survey, these figures, as obtained from local officers, cannot be regarded even as a very remote approximation to the truth. In fact they are mere guess-work. However, as such sources of irrigation are dependent more or less on the rain-fall of the particular locality where they exist, they can hardly be looked upon as preventive measures in themselves, at any rate as regards the rice crops on which alone depends the question of general famine in Bengal. In Behar, where well irrigation exists for the more valuable dry weather crops, such as sugar-cane, poppy, &c., the area covered by wells may be estimated at 600,000 acres in round numbers.

As regards State irrigation, there are three projects in partial working order, the works on which are still in progress. They are the Orissa, the Midnapore, and the Behar Canals, or series of canals.

The following are the areas that will be commanded by these canals, when completed to the extent already sanctioned by the Secretary of State :—

	Acres.	Sq. miles.
Orissa - - -	181,000	362
Midnapore - - -	140,000	280
Behar - - -	1,000,000	2,000
Total -	1,321,000	2,642

In Midnapore, however, owing to defective water-supply, not more than 60,000 acres could be effectually protected in the very worst years. On the other hand, a comparatively small additional outlay in distribution, for which sanction has already been asked, will double the irrigable area in Orissa. Thus the total area which the works now in progress will protect may be taken as 1,421,000 acres, or 2,842 square miles. But the area for which distribution had been constructed up to the end of 1877–78 was not above 500,000 acres. The irrigation of this latter tract only may be presumed to be thoroughly effective at present.

The Mahanuddy and Sone, which supply the canals in Orissa and Behar, though fed only by the monsoon rains, have an unfailing supply for the areas above stated. In the case of Midnapore the catchment basin of the river is so small that the supply varies with the local rains, and fails to a considerable extent in years of extreme drought, such as 1873–74.

Central Provinces.

Mr. Nicholls.

CENTRAL PROVINCES.

What area of your province and of its several districts is protected from drought in an average year by irrigation from—

(1.) *Canals, jhils, or channels from rivers?*

(2.) *From wells and tanks?*

There are no canals or jhils. The depth of the river beds below the ordinary level of the land also precludes, save in perhaps a very few instances, the construction of irrigation channels from rivers. No such channels have been constructed.

Statistics of irrigation from wells and tanks are given in the following statement:—

Statement showing the Area irrigated in each District.

Districts.	Area in acres irrigated from wells and tanks.		Districts.	Area in acres irrigated from wells and tanks.	
Nagpur - - -	12,492		Manda - - -	1,219	189,445 irrigated from tanks.
Bhandara - - -	320,863	302,500 irrigated from tanks.	Narsinghpur - -	2,455	
Chanda - - -	146,945	134,901 do. do.	Nimar - - - -	9,257	
Wardha - - -	4,859		Betul - - - -	12,163	
Balaghat - - -	10,287		Chhindwara - - -	7,702	
Upper Godavari - -	4,616		Narsinghpur - -	6,892	
Jubbulpore - - -	3,949		Raipur - - - -	10,813	
Saugor - - - -	4,507		Bilaspur - - -	196,161	
Damoh - - -	1,271		Sambalur - - -		
Seoni - - - -	18,451		Total -	774,902	

I give the following extracts from settlement reports to illustrate this statement :—

"*Bilaspur.*—At the same time the country is not entirely dependent on the regularity of the monsoon. There are scattered over the district some 7,000 tanks, which the forethought of succeeding generations has contributed to construct. Although not entirely available for watering the fields (for many are strictly preserved to provide water during the heats of summer for man and beast), yet a large number are utilised for purposes of irrigation, and thus some portion of the crop in numerous villages at all times comes to be saved. To increase the means of artificial irrigation is as desirable an object in Chhattisgarh as in other parts of India; but the construction of canals or capacious reservoirs of water to achieve this end, is not likely to be attempted during this generation.

"These great works can only be effected by a large outlay, and it is certain that at present they would not be remunerative. I mean remunerative in a practical, not a philanthropic sense. Such works render a famine impossible, but for ordinary crops water would only be taken in special seasons, while sugar-cane and other irrigated products would not for years be extensively enough cultivated to yield a large annual income. In fact a scant population and a large irrigated area cannot co-exist, and therefore in Chhattisgarh the best assistance the agricultural classes can

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CENTRAL PROVINCES.
Mr. Nicholls.

receive is the liberal aid of takavi advances to extend on all sides the gradual construction of tanks.

" *Chanda.*—Irrigation is carried on from :—

Tanks.
Borees or ponds.
Gattas.
Wells in fields.

Springs, pools and shallows, wells in the beds of streams; the number of the first, second and fourth being—

Tanks - - -	1,749
Borees - - -	1,831
Field wells - - -	767

" In selecting a site for a large tank the following points have to be kept in view :—

" The situation must be near hills and receive their drainage, so that the tank may fill quickly, however small the rain-fall.

" The position must allow of an ample escape channel being dug in firm rocky soil, with a course which will take off the flood waters without injury to the dam or to the cultivation.

" The dam must be short and not exposed to any violent rush from the in-coming water. Good land for wet cultivation must be below the tank, at not a greater distance than two or three miles, and be so situated as to permit the tank water flowing over all parts of it.

" The dyke is constructed of earth faced with rough blocks of stone, and the water is led through by a system of vertical and horizontal ducts built of stone. This arrangement gives a perfect control over the outflow, and throws upon the passages little beyond the downward pressure of the water—indeed a properly constructed 'tooroom,' as these sluices are called, is as strong as any other part of the embankment, and on reaching the outside of the dam, the water is conducted to the fields by open channels. The large tanks of Chanda are admirably situated and embanked, and form magnificent reservoirs, but the great mass of water thus walled back entails constant care during the rains, and the dyke is then anxiously watched by day and night. When floods are out and the level rising fast, the watchers beat the alarm drum, and the whole village thereupon hurries to the tank, some to keep the escape channel clear, others to repair on the instant ought that gives signs of yielding in the dam. Thus hours go by in battling with the waters, and at last the crisis is over, and the workers return glad and wet and weary to their homes. The Taroba lake, however, has a dam sixty feet high in perfect condition, and yet for centuries that dam has not been repaired. The outflow of water in small tanks is provided for by a wooden tunnel, generally formed of the hollowed trunk of a mohwa tree, the wood of which will remain good under the action of water for many years. But these passages weaken the embankment considerably, and not unfrequently lead to its giving way.

" In borees the dam is cut through yearly, and the water allowed to run off as required, the breach being repaired before the setting in of the next rains.

" In gattas the land above the dam is cultivated. To construct a gatta, a miniature valley, with gently sloping sides through which the stream flows, is chosen. The space between the banks of the stream is built up in the hot weather with trunks of trees, having their thinner end towards the point from which the current flows, and across these are fixed smaller logs and brushwood. The up-stream face has thus a gentle slope to the front, while the rear face is almost perpendicular, and is sometimes strengthened by vertical stakes. The barricade is carried from four to eight feet above the level of the banks, and is then heaped with earth. As soon as the first rains have softened the ground, sods about 15 inches long by 12 broad and five thick are dug with a heavy teak implement, called a katwa, and with the sods wing embankments are built. These are run out in continuation of and level with the log barricade, until the rise of the valley sides reduces their height to about a foot, when they are sloped off to the front, and flanks and pipes of mhowa, eyn, or gongul are put through; similar gattas are constructed at convenient distances at other points of the stream, and if the situation be favourable twenty of these gattas may be seen spanning the valley in regular series. Surplus water passes round the flanks of the gatta, and sometimes in floods the stream tops the dam and cascades over. Rice is planted in the wet ground above the dam, and where there is a succession of gattas, water, if required, is passed from a higher to a lower level through the wooden pipes in the embankment. Some of the gattas rise to 20 feet above the stream bed, and are very substantial structures, flooding large areas.

" Water from wells and pools is raised either by the mot (leather bag) and bullocks or by means of a long pole working on a pivot between two upright posts, and having a leather bucket at one end, which dips into the water, and a weight at the other, which assists the labourer in raising the full bucket.

" *Wardha.*—Tank irrigation is unknown; the sites for reservoirs are not numerous, owing to the small extent of hill country which, with its entanglement of ravines and gorges, generally affords the greatest facilities for the construction of artificial lakes. What irrigation there is, is from wells, and is to be found chiefly in a few villages of the Anji and Nachangaon pergannas, where enterprising malis and telis, having dug wells, cultivate small garden plots close round the village sites. In these gardens native vegetables in small quantities are grown. The crops raised are opium, the betel leaf (pan), turmeric, and sugar-cane, all of which require very careful cultivation. They return, however, a high profit if the season is not altogether unpropitious. The vegetables raised are sold in large quantities at the weekly markets, and are of the ordinary descriptions most liked by the natives."

Nagpur.—The same description applies alike to the Nagpur district. There is some irrigation of sugar-cane from the Sur River, which has a particularly shallow bed. Tank irrigation is confined to the celebrated pan gardens in the north of the district.

Chhindwara.—In the Chhindwara district the chief crop raised by irrigation is sugar-cane; other garden crops are also grown; sugar, opium, and potatoes by all classes, the rest only by kachis and malis. Irrigation is chiefly carried on from wells by means of a leather bag termed a "mot," which is let down by a rope of hide over a wheel, and drawn by a pair of bullocks proceeding down an inclined plane, until the bag reaches the top and its contents are discharged into a trough leading into the water channel. The bullocks are walked backwards up the incline until the bag again reaches the water and is filled. The same plan is also adopted in drawing water out of streams dammed up for the purpose. Persian wheels are quite unknown. Tank irrigation is scarcely practised in Chhindwara. The mot requires one man to raise the water and one to distribute.

The Persian wheel requires two men to raise the water and a third to distribute. It raises more water, and does not wear out the bullocks so quickly. But it continually requires repairs, and tolerably skilled carpenters are very rare in our villages.

Betul.—Opium was a considerable crop irrigated from wells. It will now be replaced by an increase of sugar-cane and garden vegetables.

There are but few tanks in the district, and none of them are used for irrigation. Around Betul itself wells are chiefly shored up with wooden logs laid hexagonally or otherwise round the sides. These will last for 20 years if the wood used be teak.

In Multai, where stone is plentiful, the wells in places are built of it; but the majority of wells are kucha, having no support beyond that of the native rock; very few are built of brick. The supply of water generally throughout the district is most abundant, and it is no uncommon thing for a well to irrigate six or even eight acres of land; the "mot," however, must in these cases be kept constantly going, and frequent changes of bullocks are required.

Mandla.—In Mandla there is nothing beyond gardens, pan, and sugar-cane irrigated from wells by the "mot." In the rich regar lands, where the fields are embanked or "bunded," double crops are produced every year without deterioration of the soil.

Rice grows luxuriantly in them, and weeds are not very difficult to keep down. After the rice comes the second crop of wheat or some description of pulse.

The Settlement Officer, Captain Thompson, was an enthusiast as regards irrigation. He writes :—

"*Seoni.*—There is also every reason to hope for improvement in cultivation by the introduction of the embanking system. It has, as I have before mentioned, been carried on regularly amongst the south country cultivators, the 'Powars,' &c., and I have for years been trying to induce the western Hindu cultivators to take to it, dilating on its advantages and pointing to the example of the Powars, but have always been put off with excuses, either that the force of the surface drainage was too great, or that the soil was too friable to stand in bunds, or something. But now, the proprietary questions being all decided, and assessments declared, the people are taking to the system a great deal ; so much is it the case, that the Deputy Commissioner, who has been comparatively a short time in the district, noticed it. The system, if carried out, would of course increase the produce very considerably, and it will most probably lead to manuring. If to these improvements on the part of the people is added the construction by Government of irrigation reservoirs, suggested by me officially, the increase in produce and in cultivation, more especially of the valuable crops, sugar, opium, and the like, would be almost unlimited ; and it would acquire a permanence and certainty which can never be hoped for in any other system."

But Mr. Wardlaw, who had an intimate knowledge of the country, and effected some early settlements, writing in 1831, observes :—

"The country also generally speaking is extremely unfavourable for irrigation being had recourse to, in consequence of the unevenness of its surface, and without it I imagine that manuring would be found to occasion an expense which the improved return of the crops would by no means repay, and unless some clear and distinct prospect of gain is pointed out to our agricultural subjects they have not the means nor even the inclination to attempt any speculative improvement of a precarious nature. If bunding the lands in this district could be accomplished it would not only be a source of considerable profit to the cultivators, and render the success of the crop more certain, but would greatly increase the revenue of Government. In the taluks of Hirdinugger and Tirhetie, in the tahsildari of Mandla, and in a few of the villages in Burgee which border on the Narsinghpur district, the lands are banked ; but in no other part of the Seoni district will it answer for the rabi cultivation, I mean, for the low flat rice lands* of Katangi and Karolah are all embanked.

"The reason given for its not succeeding is that the country is not sufficiently level, but the chief one I believe is that the soil does not possess that adhesive quality which is indispensably necessary to keep the water within its proper bounds, and to prevent it from oozing out. The experiment has been tried, but invariably failed ; the water first began to get out by degrees, till at length the embankment was completely swept off. The next thing to be considered is that of the introduction of more valuable crops ; but this also is attended with its concomitant difficulties, viz., the general poverty of the people, and the great want of that spirit of enterprise and speculation in those who do possess the means. The growth of sugar-cane, for instance, might with advantage be very considerably increased and prove a source of great profit, both to the cultivator and the purchaser."

The Settlement Officer, Mr. C. A. Elliott, B. C. S., writes :—

"*Hoshungabad.*—The large crops, kharif and rabi, as a rule, are neither manured nor irrigated. Opium, tobacco, pan, rice, sugar-cane, melons, and all the small market garden crops which kachis sow, are manured ; and all except rice, tobacco, and melons are irrigated. But they are considered as a kind of fancy agriculture, and the true cultivator, the kirsan, looks on them with contempt, as little peddling matters ; and what stirs his ambition is a fine large wheat field (gohali) 80 or 100 acres in extent, as flat as a billiard board and as black as a Gond.

"There is no tank irrigation."

The Settlement Officer, the late Captain Forsyth, wrote :—

"*Nimar.*—The geological structure and physical conformation of the district have been described as peculiarly favourable to irrigation, both by wells and from dams across the numerous streams.

"The water-bearing stratum is reached by wells in most parts, at from 10 to 20 feet from the surface. In some parts there is a supply up to the month of March within 10 or 12 feet. In the more open valleys of the Tapti and Nerbudda it is not reached at all within 90 or 100 feet ; and, as in all trap formations, occasional instances are found where some unsoundness in the underlying rock deprives the surface strata of all water accessible by wells. The neighbourhood of the Khandwa civil station is an unfortunate instance of this. In many places there is nothing to get through to reach the water but mooram (partially disintegrated trap) ; in others hard trap is come upon, which cannot be overcome except by blasting, which the common ryot seldom attempts. A masonry lining is seldom required at first, except where there is deep black, or mân soil, but without a retaining wall the mooram soon decomposes and slips into the well, which thus gradually widens and requires annual repairs, or after some years may even have to be abandoned. It costs about Rs. 40 at present rates to sink a well through 15 feet of mooram, and Rs. 400 to thoroughly line it with masonry, which is very seldom done. The ordinary mot or leathern bag, drawn by a pair of bullocks walking down an inclined plain, with painful retrogression up the same, is the only method employed for raising the water from wells. I do not recollect noticing in other districts a fashion they have here of lightening the labour of the ox by placing a bundle of methee or some other succulent fodder at the bottom of the incline, on reaching which at each turn one scanty mouthful is allowed. The annual cost of mot and ropes and wooden fittings is about Rs. 8. An average sized mot holds 5½ cubic feet of water, and is raised about once a minute in a 15-feet well. A pair of bullocks can work nine hours a day, so that the discharge is 2,870 cubic feet per diem. An ordinary flooding of one acre takes about 15,000 cubic feet of water, so that about five days are required to flood that area of land ; spring crops require four such floodings, and therefore take twenty days' labour of one pair of bullocks per acre fully irrigated. One man can work the mot and bullocks, with a double rope to regulate the discharge ; and one additional hand, who may be a woman or boy, is generally engaged in arranging the flow of water in the fields, but is often dispensed with, the bullock man doing this as well.

"A dam across a small stream for irrigation is called a *pat*. It is composed of heavy stones and brushwood puddled with clay, and is removed each year to allow the force of the monsoon floods to pass, and replaced about November for the irrigation of the rabi (spring) crop, which is the only crop (except garden and sugar-cane) irrigated in Nimar. It costs little to make with the united labour of all concerned, and is very effective for cold weather irrigation. It is usually built slanting across the stream, the channel being led out at the lower end. This channel is a mere ditch cleared out annually. It sometimes runs

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* Now belonging to the Balaghat district.

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a mile or more before reaching such a level as to command the land for irrigation. The average area watered by each pat is very small, namely 17 acres. There are 36 usually going, but the number varies a good deal with the amount of the rain-fall. This rough but effective system of irrigation is much practised, I believe, in Afghanistan and other Mahomedan countries, and seems to have been introduced in India by the Moghuls wherever they ruled.

" The physical conformation of Northern Nimar does not appear to be favourable for the construction of irrigation tanks, the porosity of the sub-soil and the feature common, I believe, to all trap countries, of unsoundness in the underlying rocks, admit of such an amount of percolation as to render the retention of water in high-level tanks a matter of great difficulty. Thus of the numerous tanks constructed or repaired by the district officer in 1846, only one is now of any use for direct irrigation; another result aimed at by the construction of many of those tanks has however been partially attained, namely, the retention of moisture near the surface, so that it can be tapped by shallow wells in some places where, owing to peculiar features, water was very scarce at reasonable depths in the hot weather. On the whole, however, I fear a great deal of the money then spent was quite thrown away, save in so far as it gave employment to the people in a time of considerable scarcity.

"The solitary instance of a successful irrigating tank in the districts is the Luchora reservoir in pergunna Beria, which irrigates from 170 to 250 acres of the land of Kusba Beria according to the amount of the rain-fall supply. This reservoir was originally constructed by the Ghori kings of Mandoo, and consists of a large earthwork bund thrown across the mouth of a valley in the low hills which bound the open Nerbudda valley to the south. It could never have paid anything like a fair per-centage on its original cost. The water that can be stored is generally but little more than is required for the above small area, though an additional extent of land in Holkar's adjoining villages of Bhatoor and Sekunderkhari might be irrigated were the bund strengthened so as to retain the whole of the ordinary water supply available. The repairs in 1846 consisted of closing up the gap which had formed in the bund, and constructing a masonry sluice and other works of delivery, and a masonry channel for a considerable part of the distance over which the water has to be led to the lands of Beria. The channel runs right through the bazar town of Beria, and has been, no doubt, of great benefit to the place. It has also yielded a good return of profit on the cost of repairs, which was Rs. 5,000. The revenue due to the water received during the settlement amounts to Rs. 495, or nearly 10 per cent. per annum. This is perhaps the most remarkable instance in the district of the effects of manure and water. The soil is naturally very light *mal*, and a great part of it mere *khurah*, of the poorest sort. Yet by manuring every second or third year, and with the abundant supply of tank water they have (which has not the defects of that led directly from streams), twelve-fold returns of wheat are regularly got, and in intermediate years heavy crops of gram and other pulses. 'If you manure and water a stone,' said a Beria Kunbi to me, 'it will yield something.'

"In addition to this tank two masonry dams (*bundan*) across the river Abna were constructed about the same time by the district officer. They were not quite so successful as the Luchora scheme in a revenue point of view. That at Mauza Kharwa costs Rs. 2,407, irrigates about 57 acres, and has paid Rs. 2,396 in 21 years, or not quite five per cent. on its cost. That at Khondia is still smaller. Another dam was commenced across the Abna river at Siloda, about eight miles above Khandwa, but was never finished, owing to the failure of funds.

"The labour of one hand only, to regulate the field channels, is required in channel irrigation, either from tanks or river dams. The total area under irrigation from all these sources is still only 8,411 acres, or not quite three per cent. of the whole cultivated area. This is a considerable increase on the breadth irrigated previous to the commencement of good administration in 1846. I cannot get statistics of the channel irrigation at that time which can be compared with those now ascertained. But the well irrigation of those pargannas which still belong to the district seems to have then amounted to only 2,327 acres, while it is now 7,423 acres, an increase of 220 per cent. The increase, since last settlement, of irrigation, both well and channel in the settled pergannas has been from 4,995 to 7,413 acres, or 46 per cent., a result not perhaps unsatisfactory, but still much below what might have been attained had the flood-gates of capital been fully opened by the 'magic of property.'

"Contrary to an opinion often expressed, well water is here considered to be more fertilising than that of streams. A difference of one Nimari maund (128 lbs. per acre in an irrigated wheat crop, or about 13 per cent. of the maximum yield,) is said to represent their respective values. The people say the channel water is too cold. I should be inclined to attribute this circumstance to two causes: first, that the small streams rapidly running off the almost denuded hills bring down comparatively little fertilising matter in suspension, as the more sluggish streams of Upper India do, while the trees which usually overhang the wells contribute a considerable amount of such matter to their water; and secondly, that the channel water, where several cultivators have to be served, cannot be given to the fields exactly as it is required, and often lies all night on the surface of the sodden ground, thus tending to rot the stems, while well water can be given in such amount and at such times as is wanted, and in the day-time when the heat of the sun aids it in rapidly percolating to the roots, the stems being kept dry by evaporation.

"*Bhandara* (*from the Central Provinces' Gazetteer*).—This part of the country is chiefly cultivated by means of irrigation from tanks, for which the Bhandara district is famous. 'These tanks,' writes a former Chief Commissioner, Sir Richard Temple, 'are so numerous, and some of them so large, being many miles in circumference, that this tract might almost be called the Lake Region of Nagpur. Here a tank is not a piece of water, with regular banks crowned with rows or avenues of trees, with an artificial dyke and sluices, and with fields around it, but it is an irregular expanse of water; its banks are formed by rugged hills covered with low forests that fringe the water, where the wild beasts repair to drink; its dykes, mainly shaped out of spurs from the hills, are thrown athwart the hollows, a part only being formed by masonry; its sluices often consist of chasms or fissures in the rock; its broad surface is often, as the monsoon approaches, lashed into surging and crested waves.' The principal lakes are known by the names of Nawagaon, Seoni, and Sonagaon. Besides these are thousands of minor tanks, used for irrigation, many of which retain an ample supply of water throughout the hot season. There are also numerous sites for new tanks of large size, now ruined and requiring repair, though at such an outlay as to render the undertaking one of doubtful advantage.

"Major Pearson, late Conservator of Forests, Central Provinces, in a report upon the irrigation of the valley of the Wainganga, submitted to the Chief Commissioner in March 1863, points out that there are two distinct kinds of tanks in this region. He describes them in the following passage:—

"'The first and by far the largest are formed in the undulating country of the lower districts in the valley, by taking advantage of the contour of the ground, and constructing a short dam so as to form a lake or basin for the drainage of the surrounding hills. The second-class is that commonly found in the flatter country, and away from the hills, where a long low dam is raised across the upper portion

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of a gently sloping plain. These are more or less excavated near the centre, where some nala or depression of the ground is taken advantage of to create a reservoir more or less deep.

"The long arms of the dam collect the drainage, which fills into the centre reservoir, and when this is full, spreads itself out into a large shallow tank; the water is thence distributed to the rice fields below; and although there is an enormous loss from evaporation, yet, as the rice does not require water for above two months, or at most 75 days, the tanks generally suffice for the purpose required. Tanks of the last description are sometimes of very large size, but commonly they are what are called 'boris,' having embankments not more than 10 or 12 feet high, and as soon as the rice crop is gathered, the dam is cut, any remaining water let out, and a crop of wheat or linseed sown in the bed. This is almost a universal practice in the northern perganas of Bhandara. Indeed it seems the only means of raising a dry crop which the people possess in those districts. I have seen several very large tanks so drained and cultivated.

"There are altogether 3,648 lakes and tanks; some of the rivers also afford facilities for irrigation. The Bhowanthari, for instance, which runs from east to west of the perganna of Chandpur, supplies water for the cultivation of sugar-cane, which is grown in large quantities on both banks."

Bhandara Settlement Report.—"The wells of the district used in irrigation are almost entirely applied to the raising of garden crops. At the time of measurement there were 1,248 irrigation wells, including masonry wells and mere shafts sunk in the earth. There are said to be 3,720 wells for drinking purposes of all kinds, so that the total of wells throughout the district is 4,968; of these, but 925 are returned as being substantial. Many wells have their sides protected by wooden boards, instead of by masonry wall sides. These wooden walls are numerous, and preferred by the people to the more expensive structures with trap or laterite walls. It is only now that permanent and substantial wells are being generally constructed. The irrigation wells are easily sunk, and at slight expense, but they are only required by certain classes of the population. Again the area watered by a single well seldom exceeds two acres. The cultivators who irrigate from wells, always belong to the Murar class. He bears the cost of irrigation, and yet is able to pay a heavy rate on his garden plot. The Bariah-murar raises sugar-cane and vegetables in his garden plot, while the Phul-malis are more addicted to the culture of fruits and flowers. They are the only class who really make a living by irrigated cultivation. Ponwar landholders often have a small irrigated plot close to their dwellings, and raise therein a few edible herbs; but small plots like this cannot be reckoned a part of the regular agricultural system. Gram and wheat are never irrigated. The water for the rice fields is supplied by tanks; for betel gardens, and for sugar-cane fields in the regular sugar-cane yielding tracts of the south, water is drawn from the nearest tank or reservoir."

Raipur.—From Central Provinces Gazetteer.—"One of the most distinguishing features of the district is the great number of tanks. These are generally formed by throwing a dam across a hollow, but in most large villages there are one if not more tanks to be found embanked on all four sides, and planted with trees, the work of some public spirited villager or perhaps of some enterprising Banjara, who used to pasture his cattle in the village in the day when the jungle was uncut. These tanks, which depend almost entirely on the rain-fall for their water supply, are considered on that account to give better drinking water than those formed by throwing a dam across the valleys, and in this respect they must be allowed to have some advantages; but as but little care is taken to keep them clear, the water before the hot weather is generally a muddy mass of impurity; besides the trees round the tanks there are but few to be seen throughout the greater part of the district; and mango groves, so common in Upper India, are here few and far between. Wells were unknown in the district till the last two years, but the recent orders granting rent-free land to persons digging wells have led to the construction of wells lined with masonry in many of the khalsa villages. Along the banks of the Mahanadi and to the south of the district water is found at from 12 to 24 feet from the surface; but in the east it is not so easily procured."

Raipur.—"Well irrigation is practised to a small extent at present, but it is confined chiefly to garden produce, nor is it possible that it will ever be largely used in Chhattisgarh, as the nature of the soil in most parts makes well digging very difficult. Sugar-cane is generally irrigated from tanks, though when no tank is available and water is near the surface, well irrigation is used. Rice is rarely irrigated, except where there is a failure in the rain-fall; but the means for distributing the water are very imperfect, the only means in use being the cutting of the tank bunds, for sluices are unknown; and as to cut a wide channel through the bund would destroy the tank, those cut are so narrow as to irrigate but a very small portion of the land, while the stream is at best so slender as to effect but little good. In the present year (1869), when a large portion of the crop has been lost from want of rain, the efforts to save it by letting the tank water into the fields have in every instance that I have seen been almost abortive.

"The same causes that prevent the application of more labour and money to cultivation would prevent the success of irrigation, and therefore the question of the irrigation of the country is not one that presses at present; but in time it will become of the utmost importance, for Chhattisgarh is a rice country, and rice must have water. Hence when the population increases to such an extent that the produce leaves only a small surplus after providing for the consumption of the country, or when trade becomes so brisk as to draw largely upon the grain stocks of the people, a season or two of short crops cannot be borne as at present without much distress, and a scientific system of irrigation will have to be introduced to prevent the great evils that must befall a country without internal resources, especially one which is, as Raipur must always be, remote from any adequate source of supply. Facilities for such a system exist in abundance in the surplus waters of the rivers, while in the interior the valleys between the rolling uplands present numerous sites where large reservoirs could be made."

Sambalpur.—From the Deputy Commissioner's report on the scarcity of 1868–69.—"It is also to the energy and enterprise of these same men (the Gaonteahs, or headmen of the villages) that we owe the numerous tanks which stud the face of the khalsa part of this district, and which saved so much of the rice crop both in 1865 and in 1869.

"The varieties of rice cultivation comprise:—

"*2nd.*—That grown on the 'mal' lands, which are also comparatively high, though generally more level than the 'at' lands, and where the fields are surrounded by low embankments.

"*3rd.*—That grown on the low-lying or 'bahal' and 'berna' lands. The former of these terms is applied to the lands under the tanks, and the latter to the dips and hollows between the 'mal' or 'at' lands. In both of these classes of lands the fields are surrounded by strong and high embankments, and the bahal lands are susceptible of irrigation from the tanks.

"A great part of the rice sown on the bahal and berna lands is transplanted; it is the late and most important crop.

"In the case of bahal lands it is possible to perform most of the necessary processes of cultivation, although the rain may not fall just when it is desirable."

The late Commissioner of Raipur, who had been Deputy Commissioner of Sambalpur for years, also wrote:—

"In the khalsa portion of the Sambalpur district scarcely a village is without an irrigating tank, as well

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as an ordinary drinking tank; so that, no matter how the rain is distributed, so long as it is plentiful, the crops of rich rice lands lying in the vicinity of the tanks can nearly always be saved. The 'bunds' or embankments also of the Sambalpur rice fields are much higher than those of the other districts."

In a report on the district written by Lieutenant Birch in 1857, he states that the undulations of the surface of the land afford great facilities for regular irrigation.

Narsinghpur.—"Manuring and irrigation are almost unknown, except for sugar-cane and vegetables. There is a fine tract, containing 50 or 60 villages lying on the borders of the Gadarwara and Narsinghpur pergannas, the rates of the rent and revenue paid in which show how profitably both processes might be adopted. The staple produce of these villages is sugar-cane, irrigated from unlined (katcha) wells by means of the Persian wheel. The favourable lie of the sub-strata gives unusual facilities for irrigation here."

There is no tank irrigation.

"The nature of the soil has something to do with this apathy. It is deep, retentive of moisture, and most tenacious in its texture. Hence the amount of working and irrigation which might amply fertilize lighter soils would here be thrown away. It must be, and in the case of sugar-cane is, kept constantly irrigated to prevent the rapid induration and subsequent fissility which characterize it in its drying state. Hence irrigation here necessitates more labour and expense than in lighter soils, and though by softening the soil cultivators would avoid two great sources of damage to which they are now subject, viz., loss of the seed which drops into the fissures of the earth, and occasional loss of land, which dries up before they can plough it, they prefer the present easy system, under which they are certain of a maintenance to a life of laboriousness which would neither suit their habits nor seems required by their necessities

"The course which improvement will probably first take will be extension of the embankments already prevalent in the Srinaggar perganna, the people of which have probably taken example by their neighbours of the Jubbulpore district. These embankments retain the rain water which is let off before the autumn ploughings, leaving a sufficient amount of moisture in the deep retentive soil to ensure the life of the winter crop. They are, in fact, a substitute for irrigation, which, however valuable, is not so indispensable in this valley as in the plains of Northern India, where, unlike here, the soil is capable of retaining moisture, and no scattered hill ranges attract refreshing clouds and mists.

"The embankments have other advantages, among which may be mentioned that the flooding of the fields is the only known remedy against the growth of the rank 'khans,' and that in embanked (bunded or bundwas) lands two crops—rice followed by gram or lentil—may be produced in one year without prejudice to the soil."

Jubbulpore.—In Jubbulpore the well irrigation is but trifling. Tank irrigation is not considerable, and is confined to the raising of pan and some sugar-cane. But this is the chief seat of the "banwas" cultivation. The late Sir Donald MacLeod writing in 1842 says:—

"To the north-east and north-west an exceedingly rich and open plain opens out, the whole of which constituting the pergannas of Kumbhi, Sehora, and Garha is formed by small embankments into separate fields devoted entirely to rabi crops,—a species of husbandry which the writer has not seen practised elsewhere. No manure is used, but the land having been slightly run by a bullock plough before the setting in of the rains, both to turn it and to eradicate all weeds which may have formed, all the water which may fall upon the surface of the field during the season is confined within its bunds, and when the sowing season comes round, the surplus of moisture remaining is drawn off by cutting the embankment. This process appears to have a powerful fertilizing effect, and when the land has dried, no ploughing whatever is required further than passing through the ground the 'nagar' or drill plough, by which the seed is sown. The plan here described is of ancient standing, and it is very fortunate that it is not overlooked to be duly recorded in the measurement papers prepared for the new Settlement."

Settlement Report.—"The system of agriculture followed in this district being peculiar to itself, a short description of it may appropriately be given here. The method by which moisture is supplied to land sown with spring crops, as a substitute for the artificial means of irrigation practised elsewhere, has already been alluded to when describing the difference between tagur and bundwas or embanked lands. The principal portion of the haveli or open and level pergannas of the district, which constitute more than half of it, are thus embanked. The bunds are repaired annually during the dry season, and immediately before the rains set in the openings or cuts ('moghas') made in the embankments at the conclusion of the previous rainy season for draining off the water are closed up, and the land is turned over with a light plough. As soon as the rain falls, and where the soil is suited for it, that is 'kabur,' which can bear a double crop for successive years, paddy is sown broadcast; but such fields as are not suited for paddy are allowed to lie fallow, merely filled with water, until the middle of October, if the rains have continued to the end of September, or otherwise earlier, when the 'moghas' or cuts are opened in succession, first those of the highest fields and consecutively to the lowest; as the sowing season approaches to a termination, this and the deposit from the rotting of weeds, &c., bring two very important advantages possessed by a bundwas over a tagur field. As soon as the field begins to dry, generally the second or third day after the water is drained, wheat or gram is sown with the drill plough without any previous ploughing. As the drill plough passes through the soil, it is turned up in large clods, and from the adhesive nature of it, as well as from the wet state in which it is when the sowing begins, a more elaborate system of ploughing would not be practicable; and if the soil was allowed to be hardened before being ploughed, it would dry so fast that the seed would not germinate for want of moisture. Immediately the soil hardens, it cracks and opens out into large fissures, so that irrigation is generally impracticable. In such fields as have been sown with paddy crops, should the paddy not ripen soon enough to allow of wheat being sown in proper time, gram is sown broadcast, while the paddy is still standing, and by the time the gram comes up the paddy is fit to be reaped, which is done carefully so as to prevent the gram from being injured. This is called the ootera or chilka sowing, but the produce is nothing equal to that obtained by the regular method. Sometimes the same plan is followed in respect to fields not sown with paddy, if there is fear of the land drying before the drill plough can be used from want of bullocks or other cause, but in such cases the gram is scattered over the field two days before drawing off the water, when it takes root and is not washed away by the retiring current.

"The lowest fields from which the water escapes into a river or stream are called the 'bohh.' This 'bohh' is reckoned a great treasure, and generally belongs to the malguzar's home farm; it is enriched by what is called the 'sussum' or small particles of decayed vegetable and animal matter escaping with the water when drawn off the higher fields, and consequently bears very rich crops. After the wheat, gram, mussur, and ulsi crops have been sown, no subsequent moisture by irrigation is needed. If there is seasonable rain in the winter, the out-turn is generally very good; if not it is an average crop; but if there is too much rain in the winter, or the cold severe, the crops suffer from blight or from frost, except the wheat, which is not affected by frost. It

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is to guard against these contingencies that the common practice of sowing wheat and gram together called 'birra' has been introduced, so that if the one fails or is partially injured, the other generally escapes damage. Mr. Malony's* remarks regarding the small risks to which cultivators are exposed in the Haveli tracts are very appropriate, and may be quoted here:—

"'The only risks to which cultivators seem liable in the Haveli are from frost or from very scanty rains in the rainy season, that is rains so scanty as not to fill the khets. If the khets are over-filled, the early breaking up of the rains, or the want of rain in the cold weather, are here of no consequence. But if the khets do not fill, there is a chance of total failure; first because black soil hardens more rapidly and completely than the brown or reddish soil, and secondly, because the people have not the means of meeting the demand for increased labour and rapid sowing which this state of things occasions. There must always be rain enough to make the ground moist and fit for ploughing, even when there is not enough to keep it so, or to prevent the growth of weeds. If, therefore, a large number of ploughs could be brought to work upon it early and at once, it might be still sown, even though the khets did not fill.

"'But in ordinary circumstances this land requires so very little labour, that a plough of four bullocks can cultivate, I believe, 12 or 16 "toosses." The number of kissans and bullocks is proportioned to this facility, and, therefore, when the khets do not fill, there are not hands or ploughs to meet the emergency.'"

These are the circumstances which operate against the people of this district taking much interest in appliances for irrigation, improved modes of agriculture, &c., which we are so anxious to introduce to their notice. Of course bundwas lands differ in value according to their position, those bordering on rivers and streams being often so far from flat as to partake of many of the disadvantages of tagur or unembanked lands. The bunds, too, in such parts require more frequent and larger outlay to keep in repair, while in villages situated in level country the fields are as flat as a table and perfectly uniform in appearance.

Saugor Settlement Report.—In the Banda Tahsil of the Saugor district irrigation is little resorted to, and that only for raising crops of vegetables and watering sugar-cane. Irrigation might be extensively introduced had the people energy and means sufficient to avail themselves of the facility of obtaining water, which is to be found 37 feet from the surface.

Shahgarh.—To the south irrigation does not appear necessary, the soil being generally of a better quality; still the cultivation is slovenly, and there are no signs of enterprize. Here, again, the khans grass is the great enemy of the cultivator.

Saugor tahsil.—It has been already stated that irrigation is hardly ever resorted to, and is less than 2 per cent. on the cultivated area; still I am of opinion, notwithstanding assertions to the contrary, based upon the nature of the soil, that irrigation might be largely employed, if the people had energy and means sufficient to avail themselves of the facilities of obtaining water from the numerous streams which intersect the perganna, and by means of wells, for the water is not far from the surface.

I have seen the effect of irrigation near some village sites, and can vouch for its development on wheat, which in size and weight was equal to that produced in England.

It is well known that, during the earlier and good portion of the Mahratta rule, a vast number of wells were excavated for purposes of irrigation, now mostly filled up; and it was only when the revenues of the perganna were alienated, and the villages made over to creditors, that the funds usually advanced by capitalists for cultivation were withdrawn, and proprietors and cultivators abandoned the most remunerative crops, and irrigation fell almost entirely into disuse.

In Jeysinghnagar irrigation is hardly ever resorted to.

The principal tanks are those of Khorai khas, Khemlassa, Garhola, and Chandrapore.

These are not of great size; that of Garhola dries up in the hot weather.

Damoh.—In Damoh there is no irrigation from streams or tanks. The tanks are not numerous, and are only utilized for planting "singharas" or water nuts, and for washing and drinking. Wells can be very easily made, as the water is particularly near to the surface. Balaghat is similar to Bhandara. In the Katanghi Karoulah tract, received from Seoni, all the fields are embanked.

To how much of this area is the protection complete and permanent, and how much is dependent on the local rain?

I have now given the facts regarding existing irrigation, and the opinions of the local officers. Evidently all of the embanked lands of the Jubbulpore, Mandla, and Narsinghpur "banwas" tracts depend on the rainfall. My opinion is that not more than one-tenth of the area irrigated from tanks, and one-fourth of that irrigated from wells, can be considered as other than dependent on the local rain.

How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area?

Out of this ¼ permanently protected by wells, I am of opinion that all is cultivated with opium, sugar-cane, or garden vegetables.

Out of 626,000 acres irrigated from tanks, I estimate 62,000 acres as permanently protected. Probably 2,000 of these are for pan cultivation (reckoning fallows as well as under cultivation), and the rest, save an almost infinitesimal portion for "rice seed beds," will be used for sugar-cane and small garden cultivation. I think the sugar-cane cultivation will require this area of permanently protected land.

Bhandara - - -	7,500 acres.
Sambalpur - -	9,000 „
Raipur - -	27,000 „
Chanda - - -	5,000 „

and other districts in smaller areas.

As for the effect of irrigation of crops (other than food crops) in adding to the powers of the population to resist famine, on the population at large it must be almost inappreciable, for we do not raise a sufficiency of these crops, and import sugar, gur, and opium.

Supposing canals, tanks, wells, and jhils to be utilized to the very utmost and kept in the highest possible order, what extent of the country would be protected from drought in a year when there was a failure of the rain.

I have given 62,000 acres as probably protected by tanks and 37,000 acres as protected from wells in a year when the rainfall had been so short as not to affect the springs for wells, or as to leave the water level in them no higher at the beginning of October than it stood on the 1st May; and similarly as regards tanks. This may be termed a failure of rain.

I have no statistics to guide me, but my impression is that if existing tanks and wells were in the highest possible order, and were utilized to the utmost, my 1-10th (62,000 acres) might be raised to 1-8th (78,000 acres), and my ¼ (37,000) to ⅓ or (49,000 acres).

But if it be desired to know what would be the possible extension of irrigation by State agency or interference on a large scale and with a view to the exigencies at a time of famine, I may add that the railway is now our safeguard so far as it extends, and the practicability of constructing large irrigation

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* Mr. Malony was the first civil officer appointed to the Jubbulpore country after its cession in 1818.

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works was gone into in the years 1868-1874 and the subject was probably exhausted. For Chhattisgarh the areas to be irrigated are in the centre of a vast plain, far remote from the points where the deep bedded rivers debouche from the hills into the open country, so that no possible water rates could be expected to pay for the outlay, especially in so thinly inhabited a country. The expense, practically speaking, would be prohibitive, and moreover the rainfall of the country has been generally regular. Droughts have been but few within the period for which we have any accounts. Still, possibly, on a small scale, the waters of the Hasp, the Maniari, the Arpa, Kharod and Lilagarh in Bilaspur and of some hill streams in Raipur might be utilized in irrigation works by storage reservoirs in the hills and distribution channels in the plains.

In the Saugor and Nerbudda territories not only are droughts almost unknown and the soil wonderfully retentive of moisture, and generally not requiring irrigation to support our present population and export a large surplus, but the conformation of the country is such as to render irrigation by canal or reservoir almost impossible, and financially out of question. The case was different in the Nagpur country, where the four most feasible schemes, selected after a careful consideration of the requirements and the configuration of the whole of the Province, were thoroughly elaborated and reported on. The papers which I have consulted are :—

- (*a.*) Note on the value of irrigation in the Nagpur country by the Settlement Officers of the Nagpur, Wardha, and Chanda districts; 5th September 1864.
- (*b.*) Letter No. 1631, dated 28th July 1868, from the Government of India, Public Works Department, Irrigation, to the Chief Commissioner of the Central Provinces.
- (*c.*) No. 8-81 I, dated 28th October 1868, from the Secretary to the Chief Commissioner, Public Works Department, to the Secretary to the Government of India, Public Works Department.
- (*d.*) *Report on the Kanhan Irrigation project, dated Nagpur 26th November 1870.*
- (*e.*) Report on the Dham Irrigation project, dated Nagpur 14th October 1871.
- (*f.*) Letter No. 5390, dated 25th November 1871, from the Secretary to Chief Commissioner, Public Works Department, to the Inspector General of Irrigation Works.
- (*g.*) Report on the Pench anicut and Ramtek reservoir projects, dated 14th October 1872.
- (*h.*) Letter No. 42 I, dated 24th January 1873, from the Government of India, Public Works Department, Irrigation, to the Chief Commissioner, Central Provinces.
- (*j.*) Letter No. 4031, dated 1st August 1873, from the Secretary to the Chief Commissioner, Public Works Department, to the Secretary to the Government of India, Public Works Department.
- (*k.*) Letter No. 736 I, dated 11th October 1873, from the Government of India, Public Works Department, Irrigation, to the Chief Commissioner, Central Provinces.
- (*l.*) Revised project for the Ramtek reservoir.
- (*m.*) Letter No. 747 I, dated 14th December 1874, from the Government of India, Public Works Department, Irrigation, to the Chief Commissioner, Central Provinces, desiring that no further investigation for such schemes may be undertaken.

The Settlement Officers, however, had to admit that irrigation was not so necessary as in Northern India, and there was considerable doubt whether, if water were brought to their fields, cultivators would use it. Mr. Bernard, C.S., was rather enthusiastic on the subject, and included in his estimates some crops as paying water rates, which probably would not stand irrigation, such as linseed; also jowari, save in extraordinary years, would never require irrigation. The best of the schemes were at last found, on the representation of their warmest supporters, to be financially unsound; and though at one time it was thought worth while to try by actual experiment whether cultivators in these districts would use or would refuse irrigation canal water, it was found that no feasible scheme could be devised which would not involve the outlay of far too large a sum to be experimented with. Our southern wheat harvests are fully six-weeks earlier than in the North-Western Provinces, they require irrigation far less, and water could be used for them for a much shorter period. It is doubtful whether cotton is improved in quality by irrigation, and the superior quality of the Hinganghat staple constitutes the foremost element in its market value. I think I may sum up by saying that where canal irrigation would be of importance, nature and cost will not permit of it, and where it could be afforded to the lands, the cultivators would not use it, except in extraordinary years.

BERAR.

BERAR.

Mr. Dunlop

STATEMENT showing the Proportion of IRRIGATED LAND to UNIRRIGATED LAND in the year 1876.

Districts.	Irrigated.	Unirrigated Land.	Total.	Per-centage of total Land irrigated.
Amraoti - - -	15,686	1,349,616	1,365,202	1·14
Akola - - -	20,734	1,342,286	1,363,020	1·52
Ellichpur - - -	16,443	568,532	584,975	2·81
Buldana - -	27,634	1,176,860	1,204,494	2·29
Wun - - - -	5,379	1,091,302	1,096,681	·49
Basim - - -	15,810	921,707	937,517	1·68
Total -	101,686	6,450,303	6,551,889	1·65

From these figures it will be seen that very little land is irrigated in Berar. Irrigation in fact is limited to a small area under rice (about 21,000 acres) and to garden crops. Irrigation is carried on chiefly from wells, although in some cases the water is raised by môts from the channels of rivers, and a few tanks are made use of. But irrigation is never likely to be generally resorted to in Berar. Our chief crops—jowari and cotton—do not require it.

Colonel Nembhard (late Commissioner of Berar) wrote as follows in 1876 :—

"The irrigation is almost entirely from wells. In Amraoti the tank at Karanja is a fine sheet of water, but only five persons used it for irrigation. In the Buldana district, besides the tank at Sindkhed, which irrigates about 50 acres, there is the tank at Fatehkhelda, which has recently been restored, and which the Deputy Commissioner says waters a hundred acres, and is likely to prove a remunerative project.

"A good deal of land might be irrigated in the Wun district, but the people will not contribute towards the restoration of tanks. Captain Szczepanski (Deputy Commissioner) says, with water available for irrigation, the people will not use it if they have to pay however little for it. Captain FitzGerald has not mentioned the fine tank at Risod, in the Basim district, which is now a magnificent sheet of water * * *. This project will, I think, prove a success, for the owners of land below it appear to take water readily. Large irrigation schemes in this province must financially prove to be failures, but small projects, such as that at Risod, will, I have no doubt, make a fair return on the outlay."

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The irrigation of the whole area is dependent on a fair rain-fall. When the rains fail, as they did in 1871, the wells, tanks, and beds of streams dry up in many places. In January 1872 the crop report from the Basim district was that "the fast failing water supply is daily causing serious distress."

Ellichpur.—Major Mackenzie.—The protection is complete over whole irrigated area, so long as the water in the wells lasts. But as the wells depend on a proper rain-fall, if the latter failed, the wells would run dry. Hence protection is not permanent.

Amraoti.—Lieutenant-Colonel Menzies.—Irrigation is scarcely known in the district, which depends almost entirely on the rain-fall, and no portion of the district worth mentioning is protected in an average year by irrigation.

According to the Commissioner's Revenue Report for 1876–77, the following was the extent of land under irrigation, and these are the figures which I adopted, viz. :—

	Rice Land Acres.	Irrigated Land Acres.	Total Acres.
Amraoti - - - - - -	1,930	13,756	15,686
Akola - - - - -	508	20,226	20,734
Ellichpur - - - - - -	7,810	8,633	16,443
Buldana - - - - -	2,470	25,164	27,634
Wun - - - - - -	1,471	3,908	5,379
Basim - - - - -	7,256	8,554	15,810
	21,445	80,241	101,686

Irrigation fell off in 1877–78, and it is possible that Colonel Alexander referred to the returns for that year ; but, even if so, his figures do not tally with the Commissioner's, which are as follows :—

AREA under IRRIGATION in 1877–78.

	Rice Land Acres.	Irrigated Land.	Total.
Amraoti - - - -	1,051	13,431	14,482
Akola - - - -	890	11,250	12,140
Ellichpur - - - - -	9,030	4,128	13,158
Buldana - - - -	6,655	9,507	16,162
Wun - - - - - -	2,973	2,796	5,769
Basim - - - -	10,152	8,387	18,539
	30,751	49,499	80,250

Deputy Commissioners have been asked to furnish information regarding the number of wells in their districts, and I hope shortly to receive their reports on this point.

BOMBAY.

Bombay.

Mr. Peile.

The Agricultural Statistical Tables for 1876–77 show the following as the areas under irrigation in each collectorate :—

	Total Area.	Area cultivated.	Under irrigation.	Per-centage of column 4 to column 3.
Guzerat.	Acres.	Acres.	Acres.	
Ahmedabad - -	1,761,888	895,217	50,300	5·6
Kaira - - -	932,378	703,805	56,446	8·0
Broach - - -	736,119	401,255	—	—
Surat - -	939,938	404,991	52,627	13
Total Guzerat -	4,370,323	2,405,268	159,393	—
Deccan.				
Khandesh - -	4,410,426	2,428,386	11,819	0·5
Nasik - - -	3,108,781	1,790,639	47,691	2·6
Ahmednagar - -	3,010,606	2,122,393	37,458	1·8
Poona - - -	2,643,464	1,864,475	61,033	3·3
Sholapur - - -	2,445,783	663,700	54,021	8·1
Satara - -	2,236,107	1,209,453	43,187	3·5
Kaladgi - - -	2,154,629	1,995,780	9,786	0·5
Belgaum - -	1,750,227	946,204	17,357	1·8
Dharwar - - -	2,042,719	786,695	63,166	8·0
Total Deccan -	23,802,742	13,807,725	345,518	2·5

The figures for Ahmednagar and Kaladgi refer to the year 1875–76, the returns for 1876–77 not having been received yet. Those for Dharwar exclude Savanur and Hebli.

In regard to the blank entries in column headed "under irrigation," against Broach, there appears to be some misunderstanding owing to inaccuracy in the translation of the headings of the column in the Vernacular forms, the words "under irrigation" having been rendered "Land which has been irrigated by means of an aqueduct from dam." There would also appear to be some mistake in the area shown in this column against the Dharwar Collectorate. The area assessed as irrigated under the existing tanks in Dharwar exceeds 100,000 acres, whereas the statistical statements show only 63,166 acres as irrigated during 1876–77, including wells.

It is of course possible that the difference is due to the deficient rain-fall of the year, and a comparison with previous years' returns would show this, but unfortunately the returns for 1875–76 were prepared in a different form, and no comparison can be made.

The area under command of our new works in 1876–77 was 206,982 acres. Of this, 132,339 acres are under works drawing their supply from main rivers and streams fed from the Western Ghats, in which the supply during the kharif and early rabi seasons has never been known to fail. The remainder, 74,643 acres, is under works dependent for their supply on the local rain-fall. The following table shows the distribution of this area :—

	Under command of Works having		Total.
	An unfailing Kharif and early Rabi supply.	A supply dependent on Local Rain-fall.	
	Acres.	Acres.	Acres.
Ahmedabad -	—	34,068	34,068
Kaira - - -	—	9,751	9,751
Surat - - -	—	—	—
Broach - - -	—	—	—
Khandesh - -	39,346	584	39,930
Nasik - - -	13,336	—	13,336
Ahmednagar - -	29,408	1,530	30,938
Poona - - -	20,955	585	21,540
Sholapur - -	—	10,971	10,971
Satara - - -	26,827	16,774	43,601
Kaladgi - -	—	—	—
Belgaum - -	—	—	—
Dharwar - - -	2,467	350	2,817
Total -	132,339	74,643	206,982

The area under command during 1877–78 was 244,137, of which 159,213 was under works having a permanent kharif and early rabi supply.

The Collectors give the following information :—

Kaira.—56,446 acres of Government land are irrigated from tanks, wells, and dhekuries (lift by water bag from river beds). The area in inam villages not known. The supply is not permanent. The Collector thinks that 30,000 acres might be protected in a drought and 11,000 tons of grain produced.

Surat.—52,627 acres under irrigation, all dependent on local rains.

Tanna.—1,779 acres of sugar-cane are irrigated from wells. The principal cultivation of the district is rice dependent on the local rains.

Colaba.—Only a few cocoanut gardens irrigated from wells. Food crops depend on the local rains.

Khandesh.—About 39,000 acres are protected by tanks and canals under the Irrigation Department. Besides, there are the ordinary wells, number not stated. About one-seventieth part of the district is protected by the above means.

Nassick.—47,000 acres are irrigated and assessed as such. The means are canals and anicuts dependent on the local rains, which have been dry for the past two seasons. Besides, there are the wells made by the ryots themselves, not assessed and the number not recorded. No part of the district can yet be said to be effectually protected. The produce grown by irrigation is sugar-cane, ground-nuts, vegetables, wheat, and gram.

Ahmednagar.—There are three great irrigation works—(1) the Lakh Canal, (2) the Ojhar Canal, (3) the Bhutodi Tank. Besides, there are the ryots' wells. The ruins of many small bandharas not in use are visible, and bandharas might be constructed on the Godaveri, Sina, Mula, and Bhima rivers.

Poona.—Besides the works of the Irrigation Department, 62,000 acres are irrigated from wells, nullahs and tanks dependent on the local rain. If it fails, they dry up. It is impossible to say how far they would protect the above area in a year of drought.

Sholapur. — 1,500 wells protect incompletely 50,000 acres, but most of them will last through one year of insufficient rain-fall. The Ekruk tank is under the Irrigation Department.

Kaladgi.—About 9,000 acres are irrigated from tanks and wells dependent on the local rain. About 2,000 acres are devoted to food crops proper, the rest to sugar-cane, chillies, and vegetables. Compared with the area of the district, this is a mere trifle. In 1876–77, by aid of kutcha wells, the irrigated area was increased to 18,667 acres.

Canara.—There are no irrigation works, and the area protected by wells, &c. is inappreciable.

The question is then asked, (Q. 4) what area in Bombay is protected from drought in an average year by irrigation from wells, tanks, or canals?

The case of each province under Bombay as they come in order from north to south, is as follows :—

Sind is protected by the Indus inundation, which takes place every autumn.

Kutch is unprotected by rivers or canals, and wells are not numerous, the subsoil being salt. But it has a large trade and is very accessible, and the people are rich. The responsibility for famine relief rests on the native ruler.

Kattywar has no canals or large irrigation works at present. But it has an excellent water supply through wells. In 1877 upwards of 10,000 new wells were dug. Attention is now being given to irrigation works. The responsibility for famine relief rests on the native rulers.

Guzerat is liable to famine or scarcity, though no severe famine has occurred since A.D. 1813. It is rich and in many parts could withstand one year's famine. Irrigation canals are under construction in Ahmedabad and Surat.

The Concan does not admit of irrigational works, nor require them. The rain-fall on the coast is almost invariably heavy. There is no famine recorded, though local scarcity occurs.

The Deccan.—The tract immediately east of the Ghats is as safe as the Concan. The tract further east up to the frontiers is not safe and is that which requires protection, and for which irrigational works are under execution.

The protection now existing may be divided thus :—

(*a*) Protection by tanks and wells made by the people.

(*b*) Protection by large irrigation works under the P. W. D.

The area protected by large works under the Irrigation Department is shown in the following table :—

	Under command of Works having		Total.
	An unfailing Kharif and early Rabi supply.	A supply dependent on Local Rain-fall.	
Ahmedabad	—	34,068	34,068
Kaira	—	9,751	9,751
Surat	—	—	—
Broach	—	—	—
Khandesh	39,346	584	39,930
Nasik	13,336	—	13,336
Ahmednagar	29,408	1,530	30,938
Poona	20,955	585	21,540
Sholapur	—	10,971	10,971
Satara	26,827	16,774	43,601
Kaladgi	—	—	—
Belgaum	—	—	—
Dharwar	2,467	350	2,817
Total	132,339	74,643	206,932

These works will, when completed, command 352,029 acres. The area actually irrigated in 1876–77 was 22,801 acres. The whole commanded area is a little over two per cent. of the total area of the Deccan: when the works are completed it will be not quite three per cent. of the total area. On the cultivated* area as given in the above table by Mr. Hughes, the area commanded by irrigation is now 3¾ per cent., and will, when the works are completed. be 5 per cent.

The country is not very favourable for the construction of large irrigation works, and the success of those already constructed is not great, as may be judged by the following results of eleven years' working of the Jamda Canal in Khandesh (1866–77) :—

Receipts.	Working Expenses.	Loss.	Interest on Capital.
Rs.	Rs.	Rs.	Rs.
22,314	1,07,058	84,744	3,90,172

This is due to the disinclination of the people to take the water. It is entirely optional to use it or not, and no water advantage rate is charged on land accessible to canal water. An attempt to charge certain inam holders in Kaira for improved water supply was abandoned on their filing suits against the Collector. But legislation is now about to be resorted to.

It is clear that in some parts of the Deccan canals are urgently required as a relief from drought. For nstance in the drought-stricken tracts of Indapur and Bhimthari in Poona, where the cultivator can rely on

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* *Note.*—The area is 16,654,420 acres in the official reports for 1875–76.

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BOMBAY.

Mr. Peile.

two bad seasons out of three and the average rainfall for several years was under six inches. This tract will be protected by the Neera Canal, a work included in the list of large works designed by the Bombay Government for the protection of the dry zone of the Eastern Deccan and estimated to irrigate over 2,000,000 acres. The Gokak Canal in Belgaum is a similar work, protecting a tract of irregular and short rain-fall, where the average gauged in 18 years was 14·16 inches. Both these works and many others, of which a clear view can be obtained from the irrigation chart, were commenced as famine works in the dry zone of the Deccan between Khandesh and Dharwar. Their completion will depend on the possibility of supplying funds from the public revenues or from loans.

Equal attention does not appear to have been given to the subject of well irrigation. There has been no hydrographic survey of the Deccan to ascertain the position and capacity of the water-bearing strata with a view to wells. It would be valuable both to the people and Government to know the truth. Where wells are impracticable, water must be brought from a distance in canals. Where wells are easy and cheap of construction, canals may not be needed, or not in equal degree. A fairly good well will outlast one year of drought. It is clear that well irrigation is very scanty, and it should be known whether this is owing to the absence of natural resources or to the neglect of them. Well irrigation appears to be the best antidote to scarcity of the minor class, and especially is a preserver of the plough cattle in time of drought.

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What area of your Province and of its several districts is protected from drought in an average year by irrigation from wells, tanks or jhils, or canals or channels from rivers?

Information regarding the irrigated area in this Presidency is not complete, as no particulars are available as to the acreage under private sources of irrigation. Collectors were asked to collect the information, but several of them have reported that it would not be possible to procure any reliable particulars within the time allowed. As it is very important, however, that the information should be collected, if possible, the Board have again urged upon Collectors the necessity of using their best endeavours to obtain it, and it may perhaps be available at a future date. The difficulty of obtaining any statistics with regard to zamindari tracts is very great, as has been explained in reply to Question 3. The following statement shows the average area irrigated from Government sources in each district or charged as irrigated during the years 1874–75 and 1875–76 :—

Districts.	Irrigated Area of Ryotwari Lands.	Irrigated Area of Zemindari and Inam Lands.	Total.
Ganjam - - - -	181,241	112,987	294,228
Vizagapatam - - -	48,728	118,058	166,786
Godavari - - -	325,114	314,203	639,317
Kistna - - -	192,975	91,965	284,940
Nellore - - - -	178,503	60,331	238,834
Cuddapah - - -	116,231	128,198	244,429
Bellary - - - -	124,851	54,243	179,094
Kurnool - - - -	36,356	22,144	58,500
Chingleput - - -	296,437	91,189	387,626
North Arcot - - -	234,906	51,512	286,418
South Arcot - - -	362,316	36,871	399,187
Tanjore - - - -	782,969	164,547	947,516
Trichinopoly - - -	183.697	23,900	207,597
Madura - - - -	151,710	29,647	181,357
Tinnevelly - - -	177,410	27,164	204,574
Coimbatore - - -	92,825	11,168	103,993
Nilgiri - - - -	40	—	40
Salem - - - -	93,422	17,191	110,613
Malabar - - - -	387,024	811	387,835
Total -	3,966,755	1,856,129	5,322,884

There is no information in the Board's Office with regard to the total irrigated area under each class of work such as tanks, canals, &c., and the figures furnished by the Collectors are incomplete. A statement, however, is given on page 49 showing the number of the several kinds of works irrigating Ryotwari lands.

To how much of the area is the protection complete and permanent, and how much is dependent on the local rain?

The whole of the irrigated area in the districts of Ganjam, Vizagapatam, Bellary, Madura, and Salem depends on local rain, and no portion of it can be considered completely and permanently protected. As regards Vizagapatam, however, the Collector states that cultivation depends upon the south-west monsoon, which never entirely fails in this district. Cuddapah and Kurnool also are practically dependent entirely on the local rains, the area irrigated by the Madras Irrigation Company's canal being very small, although during the late drought there was a considerable extension of irrigated area under this work. The area under the Pennar channels in Nellore, under the Palar anicut in North Arcot, and to a great extent the area under the Madhurantakam, Utramerur, Red Hills and Sholaveram tanks and the Palar channels in Chingleput, under the Cauvery and Bhavani channels in Coimbatore, the lands irrigated by the Cauvery channels to the breadth of a mile and a half on each side of the river in the Trichinopoly district, and under the Coleroon channels in South Arcot may be considered protected, but the area is too small to have much effect in the way of keeping these districts free from famine. The portions of the Presidency which enjoy almost complete immunity from famine owing to never failing and efficient irrigation are the deltas of the Godavari, the Kistna and the Cauvery in the Godavari, Kistna, and Tanjore districts, and the lands irrigated by the Tamrapurni in Tinnevelly. The subjoined table shows the estimated area under irrigation in the Presidency which may be regarded as really protected from drought. The figures are based on the area irrigated in 1875–76, an unfavourable year :—

Districts.	Name of the Irrigation System.	Area Irrigated.
		Acres.
1. Godavari - -	Godavari delta works - -	530,579
2. Kistna - -	Kistna - - -	235,348
3. Tanjore - -	Cauvery - - - -	820,581
4. Tinnevelly -	Tamrapurni Channels - -	105,263
5. South Arcot -	Coleroon Channels - -	71,282
6. Trichinopoly -	Cauvery Channels - -	73,648
7. Nellore - -	Pennar Anicut - -	53,957
8. Coimbatore -	Bhavani and Cauvery Channels -	33,661
9. North Arcot -	Palar Anicut - - -	20,136
10. Chingleput - -	Palar Channels Madhurantakam, Utramerur, Red Hills and Sholaveram Tanks.	36,210
11. Cuddapah -	Madras Irrigation Company's Canal - - -	16,054
12. Kurnool - -	Do. do. do.	71,301
	Total -	2,068,020

The whole area of cultivation under wells, of which there are more than 375,000 in the Ryotwari portions of the Presidency, cannot be said to be completely and permanently protected from long-continued drought. During the late famine many of the wells completely failed, but there can be no doubt that even such wells are of great service when the drought is only partial

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and of short duration. The board have no information as to the actual area under well irrigation.

For reasons already explained, the protected area under private sources of irrigation in Zamindaris is unknown, but it may be generally asserted that it can be of no very great extent, as all the large rivers are under the control of Government, while tanks and the larger class of irrigation works do not as a rule receive much attention in Zamindaris. In some districts, however, as for instance Vizagapatam and Nellore, the effect of this neglect on the part of the landowners has been to give a stimulus to the sinking of wells by the tenants, and thus, though a smaller area is protected, the nature of the protection is more efficient in times of serious drought.

How much of the area so protected is devoted to food grains, and what is the total amount of produce from that area?

The only crops other than food-crops which are usually irrigated are tobacco, sugar-cane, betel, plantains, turmeric, onions, and garlic. These are generally cultivated with the aid of wells, and bear but an insignificant proportion to the entire cultivation, that for the whole Presidency being not so much as 2 per cent. For all practical purposes the whole of the protected area may be regarded as being under rice. The out-turn calculated at the rates assumed in reply to Question 3 will be as follows:—

Districts.	Out-turn in Tons of Rice, including 2nd Crop.
1. Godavari - - -	307,271
2. Kistna - - - -	141,104
3. Tanjore - - -	482,297
4. Tinnevelly - - -	59,659
5. South Arcot - - -	38,378
6. Trichinopoly - - -	36,792
7. Nellore - - -	25,969
8. Coimbatore - - -	17,537
9. North Arcot - - -	15,416
10. Chingleput - - -	13,709
11. Cuddapah - - -	10,827
12. Kurnool - - -	45,157
Total - -	1,194,116

The out-turn will be sufficient to feed only 19 per cent., or nearly $\frac{1}{5}$th of the population of the Presidency.

What is the effect of irrigation of crops other than food-crops in adding to the powers of the population to resist famine?

The irrigated crops other than food-crops are very remunerative, but, as already observed, they bear but an insignificant proportion to the total cultivation, and thus cannot be considered to have any very appreciable effect in adding to the power of the population generally, to resist famine. There is, however, no doubt that the particular ryots engaged in such cultivation are more than usually well-to-do.

Supposing canals, tanks, wells, and jhils to be utilized to the utmost extent and kept in the highest possible order, what extent of country would be protected from drought when there was a failure of rain?

Any reply to this question must be to a great extent conjectural. The opinions of Collectors as to the present state of irrigation works, and as to the extent of country which would be protected from drought if they were maintained in the highest state of efficiency, will be found in detail in the appendix. The replies go to show that, while a fair amount of attention is being paid to the larger irrigation works, the smaller ones are comparatively neglected. The question was fully considered by the Public Works Commission of 1869. No amount of attention paid to these works will secure the area under them from drought when there is complete failure of rain, but it is of the highest importance that they should be maintained in good order, to enable them to hold out against the partial droughts which so often occur. With regard to the extension of protected area the Collector of Godavari states that in that district it can be increased from 560,000 to 600,000 acres, if improvements to the delta works are carried out. None of the other Collectors allude to any works by which the protected area might be increased.

In the above consideration of this question, which relates to the area of the Presidency protected by irrigation, the two West Coast districts of Malabar and South Canara have been excluded, as there is in these districts little or no irrigation properly so called. They depend upon the south-west monsoon, which has never been known to fail to any large extent, and the first crops are matured almost entirely by the direct action of the rainfall. The following extracts from the reports of the Collectors explain clearly to what extent irrigation works are made use of:—

Mr. Logan writes of Malabar: "As the Board are no doubt aware, artificial irrigation in the sense in which those words are understood elsewhere has scarcely any existence here. And yet the district has a very large breadth of land under wet crops. Every valley in fact is a paddy-field depending for irrigation on the stream which flows down it. Except in the case of large streams, the usual plan is to construct an artificial channel either down the middle of the irrigated fields, if the stream is very small, or one or the other or both sides of the valley, if the water supply is plentiful, on such levels as serve both the purposes of irrigation and of drainage.

"Where the stream is large the volume of water coming down in the monsoon season is so enormous as to be perfectly unmanageable for any purposes of cultivation. The rich alluvial lands on the banks are irrigated from the smaller streams falling into the larger one, and the surplus water is drained off into the main stream. Towards the end of the season a few temporary bunds are thrown across some of the minor streams, while in parts of Palghat Taluk some water is stored during the rainy season in a few small bathing tanks, and let out into the fields under them while the second crop is on the ground. The area thus irrigated by storage of water is, however, comparatively insignificant.

"The only works in the district which are classed as irrigation works are dams constructed at convenient points for intercepting drainage and for preventing the flux of salt water. The cultivation dependent on these irrigation dams lies above the works and not below them as usual elsewhere. The rice crop then depends almost exclusively on the monsoon rains, and these have fortunately never been hitherto known to fail entirely."

Mr. Comyn, the Collector of South Canara, states: "Cultivation in this district is mainly dependent on " the falling rains. This is especially the case as " regards the first rice crop, locally termed 'Yenel,' " which is sown in June and reaped in September or " beginning of October, and which therefore gets the " full benefit of the south-west monsoon.

"The second rice crop, called 'Suggi,' is sown in October and reaped in February. This crop receives benefit from occasional showers after the heavy monsoon rains have ceased, but is chiefly dependent and is brought to maturity by irrigation from small rain-fed tanks or wells, or more generally channels, rivers, or rivulets, which taking their source from the forest-clad slopes of the ghât range, running along almost the whole eastern border of the district, or springing independently from isolated jungle-clothed hills, are more or less perennial. Where flow is scanty, or the lands to be irrigated are high, the necessary supply of water is obtained by the construction of temporary dams thrown up at intervals across the streams, and channels are raised by means of picottahs. The dams and picottahs are constructed and maintained by the ryots themselves without any aid from the State, CHAP. I. Qs. 4.

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except in a few cases in which a customary 'Kuttutar Inam,' or remission, is allowed for raising bunds.

"The third rice crop, called 'Kolaké,' is sown in February and reaped in May (in high lands pulses are often grown in lieu of rice). This crop is almost entirely dependent on irrigation from the sources above described, but is also benefited by the early spring showers. In case of complete failure of rain in a single season—an event happily unknown in Canara—these irrigation sources would run dry, so that it may be said that practically the whole of the cultivated area of the district is dependent on the local rain-fall extending from the coast up to the crest of the furthest ghât water sheds.

* * * *

"There are no Government irrigation works, and no account of the extent of land cultivated under each of the private sources of irrigation is kept in the district which has not been surveyed. These petty irrigation works are mostly of a temporary nature, and are kept up from time to time by the ryots. Even if kept in thorough repair they would be of no avail in case of failure of rain."

The whole of Malabar and South Canara may thus be considered as completely protected from drought, though the protection is not due to any appreciable extent to irrigation works. Taking the out-turn of food grains in these two districts into account, the total out-turn of the protected area of the whole Presidency will suffice to feed 24 per cent., or about one-fourth of the population.

APPENDIX A.

STATEMENT showing the Number of Irrigation Works in the Ryotwari portions of the Presidency.

Districts.	Tanks.				River Channels.				Spring Channels.				Anicuts.				Wells.						Remarks.
	Government.	Private.	Dasabundum.	Total.	Government.	Private.	Dasabundum.	Total.	Government.	Private.	Dasabundum.	Total.	Government.	Private.	Dasabundum.	Total.	Government.	Private.			Dasabundum.	Total.	
																		Old.	New.	Total.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Ganjam -	1,822	83	—	1,905	302	1	-	303	163	—	-	163	4	—	-	4	—	229	1	230	—	230	Dasabundum works are works which are repaired by private individuals who enjoy Inams for doing this duty
Vizagapatam	435	146	—	581	111	—	-	111	17	—	-	17	2	—	-	2	—	63	597	660	—	660	
Godavari -	1,080	147	—	1,227	39	1	-	40	22	—	-	22	—	—	-	—	7	728	74	797	—	804	
Kistna - -	370	111	17	498	649	—	-	649	59	1,196	-	1,255	27	2	1	30	57	2,011	1,141	3,152	2	3,211	
Nellore -	658	98	11	767	71	7	-	78	88	176	6	270	53	29	-	82	625	9,175	945	10,120	—	10,745	
Cuddapah -	—	—	—	—	—	—	-	—	—	—	-	—	—	—	-	—	—	—	—	—	—	43,065	
Bellary - -	847	212	150	1,209	261	26	4	291	1,075	477	4	1,556	144	11	1	156	9,743	4,675	6,330	11,005	251	20,999	
Kurnool	341	83	67	491	33	4	-	37	190	40	-	230	23	6	9	38	2,099	3,165	2,010	5,175	32	7,306	
Madras -	8	—	—	8	—	—	-	—	—	—	-	—	—	—	-	—	—	—	—	—	—	—	
Chingleput -	1,310	21	1	1,332	79	—	-	79	83	25	-	108	19	2	-	21	54	5,761	3,315	9,076	—	9,130	
North Arcot	1,933	132	806	2,871	420	19	52	491	384	54	27	465	131	3	9	143	—	47,163	5,327	52,490	164	52,654	
South Arcot	2,671	376	—	3,047	867	11	-	878	154	16	-	170	141	3	-	144	—	37,998	13,470	51,468	—	51,468	
Tanjore -	592	99	—	691	2,944	1,492	-	4,436	34	11	-	45	134	42	-	176	—	11,864	105	11,969	—	11,969	
Trichinopoly	815	502	—	1,317	671	61	-	732	3	6	-	9	75	10	-	85	9,658	4,024	1,900	5,924	—	15,582	
Madura -	2,156	2,841	—	4,997	297	297	-	594	24	5	-	29	190	151	-	341	—	15,143	9,031	24,174	—	24,174	
Tinnevelly -	2,084	122	—	2,206	164	1	-	165	62	34	-	96	131	5	-	136	—	12,498	15,931	28,429	—	28,429	
Coimbatore -	135	17	4	156	90	1	-	91	34	56	-	90	83	29	-	112	34	38,091	9,500	47,591	—	47,625	
Nilgiri - -	—	—	—	—	—	—	-	—	—	—	-	—	—	—	-	—	—	—	—	—	—	—	
Salem - -	1,360	500	150	2,010	339	2	3	344	125	14	-	139	334	58	6	398	14,244	29,841	3,396	33,237	—	47,481	
South Canara	—	—	—	—	160	73	13	246	370	376	36	782	—	—	-	—	—	2,352	360	2,712	2	2,714	
Malabar -	—	—	—	—	—	—	-	—	—	—	-	—	—	—	-	—	—	—	—	—	—	—	
Total -	18,617	5,490	1,206	25,313	7,497	1,996	72	9,565	2,887	2,486	73	5,446	1,491	351	26	1,868	36,521	224,776	73,433	298,209	451	378,246	

RAJPUTANA.

RAJPUTANA.

Alwar.—*Captain Law.*—I understand this question to be, what is the total area of the irrigated land? If so, the answer is, 122,510 acres, or somewhat less than one-eighth of the whole area of the State (*vide* reply to Question 3). The whole of this area is dependent on local rain.

There are no records to show the exact area of irrigated land sown with food grains; but it is roughly estimated that it is about 107,500 acres. The total produce, at the average rate of 22½ maunds the acre, would be about 1,996,677.

Dholpur. — *Lieutenant-Colonel Dennehy.* — The total area of the State is 763,462 acres.

Of this, 262,569 acres, or 38·3 per cent., are cultivated, and 124,432 acres, or 16·2 per cent. more are culturable and are being gradually brought under cultivation.

Of the cultivated area 69,833 acres, or 26·5 per cent., are irrigated.

36,935 acres, or 52·8 per cent. of the irrigated land is "dofasli," that is to say, it bears a double or in some instances a treble crop each year.

The greater portion of the irrigated land is watered by wells; 2·5 per cent. only is watered from tanks.

Considerable efforts have been made since 1874 to increase the area thus partially protected, and within the last four years 33 new tanks and 400 new wells have been constructed at the expense of the State.

The average amount produced per acre is:

Of wheat - - -	25 maunds.
Of barley - - -	30 do.
Of gram - - -	12 do.
Of bajra - - -	10 do.
Of joár - - -	10 do.
Of urd - - -	7 do.

Of mote - - - 10 maunds.
Of arhar - - - 12½ do.

The total consumption of the State is per annum about 1,727,500 maunds, and a surplus of about 1,501,866 maunds, chiefly of wheat, barley, and gram, remains for export.

The more valuable crops are generally limited to the field close to the village site, to which also generally the means of irrigation are confined, and on which the manure procurable in the village can more readily be made available.

The superior kinds of crops, such as wheat, joár, &c. &c., and certain of the good miscellaneous crops, occupy only 33 per cent. of the cultivation, whereas the inferior grains, bajra, mote, bejhar, gram, and barley (both of which last in ordinary years are decidedly inferior) cover 67 per cent.

Kotah.—Major P. W. Powlett.—I have not exact statistics of the area in Kotah protected from drought by irrigation; but a year ago I obtained approximate statistics, and ascertained that it did not exceed 5 per cent. of the total area. Nor should I imagine that this proportion was exceeded elsewhere in Haraoti. Rain crops so seldom fail ruinously, that there is unusually little temptation to construct wells; and tanks watering much land are few and far between.

Of 480 bighas of well land, being the irrigated of three villages, 257 or 53·5 per cent. were under food crops.

There are a considerable number of wells out of repair; and in some localities new wells can be cheaply made. When the total failure of the rains was threatened in August 1877, I reckoned on being able with exertion to add 300 to the number of working wells in Kotah in time for the rabi sowings.

Bhartpur.—Mr. L. D. Spencer.—The total area irrigated from wells amounts to 304,370-1¾ bighas. The number of wells is as follows: masonry 9,696, mud 4,042 = 13,738. A well would thus irrigate 23 bighas of land. There are 113 dams, jhils, &c., which are calculated to irrigate 272,120 bighas. The area dependent directly on rain is 1,111,664 bighas; the total of culturable land is 1,692,892 bighas. With regard to the area watered by wells, a well which in ordinary years irrigates 20 to 25 bighas will in a year of drought irrigate 10 to 12 only; that is, its irrigating capacity will have been impaired by one half. If then the yield of 1½ lakhs of bighas be calculated at five maunds per bigha, the total out-turn would amount to 750,000 maunds, which in a year of famine is enough to feed one-sixth of the whole population.

Dr. Moore.—The area of the province protected from draught by wells, tanks, or jhils, canals or channels from rivers cannot be given. Except for a short distance in the most North-western State, Bhurtpore, there is no canal irrigation. In Ajmere and Mhairwarrah, and many other places, there are numerous tanks, the country being hilly, and well adapted for the formation of tanks. All the other cultivation, except rain-crops, is from wells. But it may be broadly stated that the whole of the cultivation is dependent on rain, as many wells run dry after a failure of the monsoon. Therefore, under such circumstances, but a small portion of the country could be protected from drought; although, with a larger number of wells, the country would be placed in a much better condition to combat with famine. In Bickaneer and the semi-desert districts the wells are very deep. Sometimes the water is as far as 300 feet or even 500 feet from the surface, and irrigation is scarcely practical, and certainly not remunerative at much more than 70 feet from the surface. In these parts the people are therefore almost entirely dependent on rain-crops, bajri being the grain growing with most luxuriance in the sandy soil. Water at Bickaneer is only obtainable at 300 or 400 feet from the surface. I investigated the material brought up from a well where water had been found at a depth of 316 feet. This well was within the city walls of Bickaneer at the south-west extremity. The strata passed through was first a mass of kunkur; then a mass of "Multani mutti" or red clay; thirdly, sandstone; and lastly, white gritty sand or gravel; the latter consisting of white stones from the size of a pea to that of an egg, composed of quartz, and although not round, yet with surfaces and angles so smooth as to give rise to the idea that they must at some time have been exposed to the action of water. Carter, the geologist, has, I believe, expressed his opinion that the whole of this semi-desert portion of Western Rajputana did at some remote period form the bed of an ocean, extending from the present shores of the sea to the line of the Aravelli range, which has already been described as in its southern aspect rising like a wall from the Marwar plains below. And the geological characteristics shown to exist by the deep wells of Bickaneer would seem to support this view. On this point I may observe that I found an unmistakeable fossil shell mark on a stone of the wall of the old fort of Bickaneer, built by Bickajee in Sumbut 1545, or about the year A.D. 1484. Although no companion marks were seen on other stones, yet a more minute and scientific search than I could afford would probably prove successful. At the village of Nokha, about half-way between Bickaneer and Nagore, is a well 400 feet deep, and only three and a half feet at the mouth. Water from this well, when drawn, was quite hot. No one seemed to have any clear idea when the well was made, and no one knew why this particular spot was fixed upon for sinking a well. In other places the one village well is generally in a hollow or depression between the "Teeburs" or sand hills, where it would be reasonable to expect water nearer the surface. But Nokha is on a flat site, rather elevated above the surrounding sandy wastes, the ground being harder, and not at all the locality where water would be sought for at that depth, with the confident expectation of reward for the labour. It was stated no one attempts to sink such wells now. During the stay of the camp at Nokha, men were sent down to clear the bottom, so that a better supply of water might be obtained. The shaft being so narrow, and not faced with masonry, the cleansing process is rather a tedious business. First, a basket is let down, and then a man; he fills the basket at the bottom of the well; he is then drawn up, and afterwards the basket with its contents; and so on, till the well is cleared out. The material brought up was sandy mud, having the usual earthy odour. The water allowed to clear was fairly good, but hard from excess of lime. We let a lighted candle down this well, but the glimmer was lost long before it arrived at the bottom. I may here mention that, although the wells are so deep, the people suffer considerably from "guinea-worm," proving that the young of the guinea-worm cannot there, at least, be bred in the slimy ooze collecting on the steps of tanks, or in the neighbourhood of dipping wells, and so finding entrance into the legs of those frequenting such places, as has, with some plausibility, been theorised.

Ajmir.—Mr. L. S. Saunders.—This is a difficult question to answer. The large lakes are those only that hold water in times of drought, and possibly 10,000 acres alone could be sure of direct irrigation from them, with 13,000 acres in the bed of tanks which remains moist enough for cultivation; add 25,000 acres from wells, which would give 48,000 or say 50,000 acres in round figures as protected in all ordinary years of drought; if, however, these large lakes were to dry up, the springs in the wells would suffer, and probably this figure might be halved. In the Istimrar portion of the district nearly the same proportion may be set down as protected.

The Istimrar cultivation is set down roughly at 643 square miles=411,520 acres, so that if we calculate a lac of acres as protected fairly in the whole district in all years (except these of extreme and quite exceptional drought) I believe we may consider our statistics fairly accurate.

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CENTRAL INDIA.

CENTRAL INDIA.

Mr. Wingate.

Irrigation is very limited. In Baghelkhand Lieutenant-Colonel Bannerman says a few Kachees water vegetables from kucha wells, but even this is rare. In W. Malwa there are no large tanks, and irrigation by river or canal is impossible; but wells are used. In Bhopal and Rutlam, about one-tenth of the land under cultivation is described as "protected" by wells, jhils, tanks, and dams or nullas, though all these are more or less dependent on the rain-fall. Mir Shahamat Ali says the nullas always have enough water for the opium season. Opium, sugar-cane, and vegetables are the crops irrigated, and of the first nearly every cultivator grows a little.

HYDERABAD.

HYDERABAD.

Moulvie Mahdi Ali.

The tabular statement given below will, with certain explanations that follow, afford a fair view of the extent under irrigation from the year 1280 to 1287 Fusli (1870 to 1877):—

Years.	Telingana.	Maratwari.	Total protected.
	Acres.	Acres.	Acres.
1280	155,073	135,647	290,720
1281	170,969	153,241	324,210
1282	290,934	177,219	468,153
1283	258,367	181,681	440,048
1284	358,095	176,260	534,355
1285	234,496	142,818	377,314
1286	168,912	138,821	307,733
1287	199,363	144,553	343,916
Average	229,626	156,280	385,806

Out of the years above enumérated, 1284 Fusli was, for Telingana, a very good year, 1280 an unfavourable one, while 1283 was an average year with regard to rain-fall. The area irrigated in that year may therefore be taken as that protected from drought in an average year.

The proportions of the several districts protected from drought in the years 1285, 1286, and 1287 Fusli by means of irrigation from wells, nullas, rivers, and tanks are stated below:—

TELINGANA.

——	1285.	1286.	1287.
Wells	48·55	64·96	59·25
Nullas	7·44	4·62	4·45
Rivers	0·64	0·86	0·69
Tanks	43·37	29·56	35·61
Total	100	100	100

MARATWARI.

——	1285.	1286.	1287.
Wells	84·02	84·18	84·66
Nullas	4·22	4·22	3·85
Rivers	1·81	1·78	1·74
Tanks	9·95	9·82	9·75
Total	100	100	100

But, in order to get at the correct figures, the area in Telingana should be increased by 50 per cent.—25 per cent. to cover the difference between the correct area and the area entered in Patwari's records, from which the figures in the above statement have been taken, and 25 per cent. for double-cropped area—so that the total irrigated area may be taken as equivalent to 375,000 acres.

In Maratwari the area irrigated in 1285 Fusli (1875-76) should be increased by about 20 per cent. to obtain the correct figures, or may be taken as equivalent to 175,000 acres.

To how much of this area is the protection complete or permanent, and how much is dependent on the local rain?

The area given for the Mahratta country may be considered as completely protected, as irrigation is there carried on by means of wells, which are seldom or never exhausted in one season of drought. Of the area given for the Telingana districts, 180,000 acres (a little less than one-half) are completely protected by means of well irrigation, while the remaining area is protected by tanks and channels which are entirely dependent for their supply on the local rains. But if there be good rain-fall one year and the tanks are filled, they will then supply water for irrigation the following year, though that season may be one of scanty rain-fall.

How much of the area so protected is devoted to food crops, and what is the total amount of produce from that area?

With the exception of a very small area devoted to vegetables, sugar-cane, tobacco, opium, &c., it is food crops that are chiefly grown on irrigated lands. In the Mahratta districts, of the 175,000 acres mentioned above, half the area may be said to be devoted to wheat cultivation, the produce of which may be estimated at about 875,000 maunds (at 10 maunds* or 820 lbs. per acre); one-fourth of the area may be said to be devoted to gram and jowari crops, yielding about 437,500 maunds (at 10 maunds per acre); and in the remainder one-fourth vegetables, opium, and sugar-cane may be said to be grown.

In the Telingana country, of the 375,000 acres mentioned above, 10,000 acres only may be said to be devoted to vegetables, &c., the rest (365,000 acres) to paddy (rice) cultivation. The produce from this area may be estimated at about 10,950,000 maunds (391,071 tons) of paddy at 30 maunds (2,460 lbs.) per acre.

Supposing canals, tanks, wells, and jhils to be utilized to the utmost extent, and kept in the highest possible order, what extent of the country would be protected from drought in a year when there was a failure of the rain?

In the Mahratta country there are about 63,576 wells, of which 48,632 are in use and 14,944 are out of repair. If the latter were put in repair,† these,

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* The estimated produce of wheat from one acre of dry land is five maunds, while from one acre of wet land at least 10 maunds.

† Government is not expected to be under the necessity of taking any steps towards repairing these wells, as on the introduction of the Revenue Survey, when a 30 years' settlement is made, the ryots will, it is expected, take to improving their property by repairing these wells or sinking new ones; in fact they have already begun doing so during the last five years.

CHAP. I. Q

HYDERAB

Moulvie Mahdi A

together with those already in good working condition, would protect from drought more than 300,000 acres of land at the rate of five acres per well, which would yield 3,000,000 maunds, or 107,142 tons of grain. Now, at the rate of 1¼ lb. of grain per head per day, 6 maunds 34 seers would support an adult through the year, or 6,850 maunds (244½ tons) would support 1,000 adults throughout the year. A population of about 432,000 souls, roughly speaking, could therefore be supported in a year of drought on the produce of land thus irrigated in the Mahratta country.

In the Telingana districts there are in all about 52,685 wells, of which 33,851 are in use, and about 18,834 are out of repair. If these were put in repair an area of about 210,740 acres (at the rate of four acres per well) would in like manner be completely protected in a season of drought. This area would, on an average, yield about 622,200 maunds, or 225,792 tons of grain, which would support a population of about 91,000.* There are about 18,089 large tanks in Telingana, of which 4,924 are in use and about 3,165 are out of repair.* Besides these, there are about 10,110 small tanks, of which 5,616 are in use and 4,494 are out of repair. If these were put in thorough repair (some millions of rupees would be required to do this) about 1,000,000 acres of land would be irrigated. But, as has been remarked above, these tanks depend upon the rains for their supply.†

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* N.B.—There is some error in this calculation. 210,000 acres at 10 maunds per acre, will produce 75,000 tons of rice and feed 300,000 people.—C. A. E.

* The Government, at its own cost, repairs all the existing tanks. So many of the old tanks are out of repair that it is found more to the purpose to repair them than to construct new ones. In repairing old tanks and making new ones nearly 20 lakhs of rupees (173,913*l.*) have been spent between 1277 and 1286 Fusli (1867–76), *vide* Statement E. hereunto attached. From this statement it will be observed that in the construction and repair of tanks, channels, and wells, Rs. 37,77,573 were spent between the years 1277 (1867–68) and 1286 Fusli (1876–77).

To afford facilities for the repair of tanks a new scheme has been formulated, by which the Revenue Officers are empowered to spend annually up to two lakhs in petty repairs of tanks; the Public Works Department carry out the chief repairs, estimates for which have first to be submitted for approval to the Revenue Minister. By the new scheme in question a sum of from five to seven lakhs annually will be probably set aside for irrigation purposes. For 1289 Fusli upwards of seven lakhs of rupees have been sanctioned for the purpose.

† But as there are two permanent rivers, the Godavery and the Manjra, flowing through Telingana, many of the tanks can be easily connected and fed by them by running artificial watercourses, and this will afford permanent protection to an extensive area. This subject is under the consideration of Government.

CHAPTER I.—QUESTION 5.

CHAP. I. Q

PUNJAB

Major W

What grains form the staple food of your people? When are they sown and harvested, and what are the critical times at which rain is essential to each of them, or at which a failure or excessive fall of rain may be mischievous or ruinous?

PUNJAB.

The replies of district officers and the table calculated from them, which is appended to question 3, show that barley and the kharif millets and maize, with a little rice, form 47 per cent. or nearly half the food consumed in the province, that wheat contributes thereto 37 per cent, and pulses 15 per cent. In the Gurgáon District and Hissar Division the agriculturists do not consume any wheat; but in the Lahore districts and in the Ráwalpindi and Mooltan divisions wheat forms half of the food annually consumed by the population.

On the whole the replies received show that the two harvests contribute equally to the food of the population.

The rabi harvest being sown in September and October, it is absolutely necessary that there should be rain in one of those two months, or it will not be possible to sow successfully. Similarly, showers are necessary at the end of December or beginning of January, and again in February, and if none fall in these months the unirrigated crops necessarily fail. These winter rains almost certainly fall in sufficient quantity sooner or later. Heavy rain in March and April, when the crops are ripening, is not uncommon, promoting rust and blight and otherwise injuring the quality of both grain and straw. The rabi crops in the north of the province ripen nearly a month or three weeks later than those in the south, where the summer heat sets in perceptibly earlier.

As regards the kharif, owing to the great heat of the summer and autumn, it depends throughout for its success on the repetition of rain at short intervals of, say, a fortnight each. If a month's break occurs in the rains, the crop is much jeopardised by its continued exposure to fierce drying heat; though even after such an interval, the crops frequently show a wonderful power of recovering themselves when rain does fall. This crop is rarely materially injured by undue prolongation of the rains beyond their usual season.

I shall not attempt here to indicate the different peculiarities of the several crops. The pulses, especially gram, are more delicate than the cereals, being easily injured by too much rain. And of all the crops, wheat, which occupies the ground the longest, seems to be the sturdiest and least fickle, as it is also the most paying.

DATES of sowing and harvesting in each DISTRICT of PUNJAB, roughly stated from the replies of DISTRICT OFFICERS appended.

District.	KHARIF.		RABI.		REMARKS.
	Sown.	Reaped.	Sown.	Reaped.	
Delhi - -	June, July -	October - -	September, October	April, May.	
Gurgáon - -	July - -	September, October	October - -	April.	
Karnál - -	June, July -	October - -	September -	Do.	
Hissár - - -	Do. -	September, October	- - - -		
Rohtak - -	Do. -	October -	October -	March.	
Sirsa - - -	July -	Do. -	Do. -	April.	

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PUNJAB.

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Dates of sowing and harvesting in each district of Punjab, &c.—*continued.*

District.	KHARIF.		RABI.		REMARKS.
	Sown.	Reaped.	Sown.	Reaped.	
Umballa	15th June, 15th July	September, October	15th Sept., 15th Nov.	April.	
Ludhiána	July	November	October, November	April, May.	
Simla	April, May	September, October	November	May, June.	
Jullundur	September, October	April, May	1st half of July	October, November.	
Hoshiárpur	- - - -	Not stated.	- - - -	- - -	
Kángra	May, June	September, October	October, November	April.	
Amritsar	June, July	October and Nov.	October	April.	
Siálkot	Do.	Do.	September, October	May.	
Gurdáspur	July	October	Do.	April.	
Lahore	Not stated.	- - - -	September, October	April, May.	
Ferozepore	June, July	October, November	October, November	Do.	
Gujránwála	July	November	October	Do.	
Ráwalpindi	June, July	October	October	April.	
Jhelum	Do.	Do.	October, November	May.	
Gujrát	Do.	Do.	Do.	Do.	
Shahpur	Do.	Do., November	September, October	April, May.	
Mooltan	July	October	November, Dec.	April.	
Jhang	July, August	Do., November	October, November	April, May.	
Montgomery	Do.	Do.	November, Dec.	Do.	
Muzaffargarh	June, July	September, October	October, November	Do.	
Dera Ismail Khan	Do.	October, November	September, October	Do.	
Dera Gházi Khan	Do.	December, January	October, November	Do.	
Bannu	June, July	Not stated.	Do.	Not stated.	
Peshâwar	July	October, November	October	April, May.	
Kohát	June, August	Do.	Do., November	May, June.	
Hazára	June, July	Do.	Do.	Do.	

W. P. AND OUDH.

Elliott and Mr. Buck.

NORTH-WEST PROVINCES AND OUDH.

The statement (No. 3) appended to the answer to question 3, together with that contained in paragraph 7 of the answer, gives for each district a list of areas under principal crops distributed over the whole cultivated area of the province.

The staple foods of the country are,—

Kharif or rain crops.

Primary.	*Secondary.*
Joár (holcus sorghum).	Mandúa (cynosurus coracanuso).
Bájra (penicillaria spicata).	Pulses, 5 kinds grown with bájra and joár.
Indian-corn (zea mays).	Sawán (panicum miliaceum).
Rice (oryza sativa).	Kodon (paspalum frumentaceum).

Rabi or winter crops.

Peas.

Wheat (triticum vulgare).
Barley (hordeum hexastichum).
Gram (cicer arietinum).
Peas.

Joár and bájra are universally grown; the former on better land than the latter, which is the staple crop in the rains on inferior and more sandy soil.

With them are grown the following pulses;—

Urd (phaseolus radiatus).
Mung (phaseolus mungo).
Moth (phaseolus aconitifolius).
Mash (phaseolus sativa).
Arhar (cytisus cajan).

The first of these, urd, is sometimes grown alone. The other seldom.

The poorer classes, that is to say, the great majority of the people, live on the cheapest kharif grains from September or October till the spring harvest comes in, and on barley, gram, and peas from that time till the autumn. Where rice is much grown the coarser kinds are mainly consumed by the lower classes. Wheat and the finer kinds of rice are almost entirely reserved for the consumption of the rich, who also live on the millets joár, and bájra, to some extent in the cold weather. Both the millets and cereals are usually ground into meal and baked in round thin cakes; they are eaten either with dâl, *i.e.*, pulses mashed and boiled into porridge, or with ghi, or both together; salt is always added, but there is not much demand for pepper.

Joár and bájra are sown shortly after the commencement of the rains, and lateness in the fall of rain is a disadvantage. Bájra can, however, be put in later than joár. If no rain falls before the 15th of August they can hardly be sown, or if sown, and no rain falls for a month after the crops come up, they are burnt up, unless protected by irrigation, destroyed by heat and drought.

Rain therefore in June or the beginning of July, and again in August or early in September, is most required.

Arhar cannot be sown later than joár and bájra, but it stands a subsequent failure of rain better, and lasts when they do not.

Indian-corn is not (for a reason not yet ascertained) grown in Fátehpur, Allahabad, Hamírpur, and Bánda. Elsewhere it is a very useful crop, and can be put in as late as 1st September.

Indian-corn can, however, be sown as late as October if rain falls, and such was actually done by the Meerut Ját cultivators in 1877, but, as far as I can understand, nowhere else.

Rice requires rain at different periods and quantities according to locality. Much rice land where water is shallow is useless without heavy rains, and but little can be sown at all if there is no rain before the 15th of August. The times of sowing and reaping vary according to the temperature of the climate, and

CHAP. I. QN

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Mr. Elliott a
Mr. Buck.

sowing is, generally speaking, a fortnight earlier, and reaping a month earlier, at the eastern than at the western extremity of the province. October-November are the sowing months, March-April the harvest months. Rain is needed in August-September for ploughing. If the ordinary rains fail altogether, it is still possible (as happened in 1877), by the help of a downfall in October, to plough the land and sow the spring crops; but if no rain fall till the 15th October, much land cannot be prepared for seed, and every day's delay after that date diminishes the area up to the 1st December, when it may be said that zero is reached.

If again the ordinary rains stop during August, and there is no rain in September, the soil becomes so dry by sowing time (the middle of October), that the seed will hardly germinate without artificial irrigation. Rain is again most valuable if it falls at the end of December or in January, but not more than an inch is required then. If the winter rains fail entirely the produced on light unirrigated soil is almost *nil.*

The following can be sown as special crops under failure of rain:—

Carrots and potatoes, grown with artificial irrigation and sown in September-October, can be gathered in November to February. They are most useful under a failure of kharif (see separate note on carrots and roots as emergent crops).

Chena (panicum frumentaceum) can be sown in March and April and reaped in May and June. This is a most useful crop under a failure of rabi, and it is often grown as a supplementary crop after the rabi is reaped, but it requires an abundant and constant supply of water.

Gourds of all kinds sown in March and April and gathered from May to August. Some kinds sown with the kharif crops are gathered earlier than the kharif harvest. Gourds are vastly resorted to when stocks of food are short, on account of their quick growth.

BENGAL.

BENGAL.

Mr. Toynb

The staple food of the great body of the population of Bengal is rice. In some of the Northern districts and in Behar, rice cultivation is supplemented more or less by rabi or dry weather crops, the chief of which are wheat, barley, and pulses; and by bhadoi or intermediate crops consisting principally of Indian-corn, millets, &c. In districts where rice only is grown, the early rice and the late rice correspond to the bhadoi and rabi crops of the Behar and other drier districts.

The cultivation in the most western parts of Behar assimilates itself to that obtaining in the North-Western Provinces.

All known famines in Bengal have been rice famines. In Behar and Northern Bengal the rabi and bhadoi crops have often been the turning point between famine and no famine; but even there the immediate cause of such scarcities and famines as have occurred was the failure of the rice crops.

Other intermediate crops are grown on such a comparatively small area that they need not be taken into account. Their failure would not in itself produce famine, or even scarcity.

The rice and bhadoi crops are dependent on the summer or monsoon rains; the rabi crops on the winter or cold weather rains. Of the rice crop there are in Bengal three main varieties—(1) the early rice, which is also known as the summer or autumn rice; (2) the main crop or winter rice; and (3) the late or spring rice.

The first is sown on the highest, the last on the lowest lands; a year of excessive rainfall is as good for the former as it is bad for the latter.

The question of famine or no famine depends solely on the main crop, which is sown between April and June, and reaped between November and January according to the district concerned—its soil, climate, rainfall, &c.

There are three critical periods in the life of this crop during which rain is required, viz.:—

(1.) In May and June for sowing, when light rains are required;

(2.) In July and August for weeding, transplanting, and sub-soiling, when heavy rain is required; and,

(3.) In September and October for maturing the growth and filling out the ear, when moderate rain is necessary.

The last of these stages is the most critical, and it is to the failure of the rains in September and October that all famines in Bengal have been due.

A late fall of the monsoon rain in October is also required in districts where rabi crops are grown for the preparation of the land for rabi sowings in November. After that month the rabi is less dependent on the rainfall than the rice crops; but it requires showers during intervals of a fortnight or three weeks until the crop arrives at maturity, when the cultivators desire fine weather for harvesting, and dry, hot, west winds for drying and threshing it out.

Excessive rain has never been known to cause a famine in Bengal, even indirectly by causing floods. It damages the rice crop and rabi crop only when it falls at two stages of their growth, viz.: (1) the earlier —*i.e.*, before the young plants are high and strong enough to bear it, and (2) the latter—when the grain is formed in the ear and the plant is beaten down by the rain. Exceedingly good and promising crops have often been damaged by heavy rain, especially at the later stage of their growth, but never to such an extent as to cause any widespread distress. The bhadoi and early rice crops are sown in April and May, and reaped in August and September. They require only a moderate rainfall at regular intervals. The rabi crops and late rice are sown in October and November, and reaped in April and May. They are more independent of rainfall than either of the other two class of crops, and irrigation from wells and jheels is generally resorted to in the absence of favourable rain.

In many of the districts of Chota, Nagpore, and Southern Behar, the fruit of the mohwa tree forms, in both bad and good seasons, an important element in the food supply of the poorer classes. It is also extensively used for the manufacture of country spirit. The mangoe fruit forms in many districts an important item in the food of the people for about three months of the year (May to July).

CENTRAL PROVINCES.

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r. Nicholls.

Joár is the staple food in Nagpur, Wardha, Nimar, Western Chanda, the south of Chhindwara and of Betul.

Joár ordinarily is sown from the first fall of rain on the poorer and higher grounds till the end of July in lower lands. The critical time is through August, when a total cessation of rain will destroy the plant on the high lands, and an excessive fall will rot the seed and young plant in the lower grounds. Again, after full rains in August a total cessation in September will destroy the plant on the high grounds, but heavy rain will benefit high lands, and will not injure the low lands to any considerable extent. The rains which fall at the end of September, or early in October, will determine whether the out-turn be well above or far below the average.

The inferior variety of joár cultivated on the high grounds is harvested in November; the bulk of the crop on richer soil in December. The cultivation of the lighter sort is on the increase, as it is almost independent of the uncertain October rains.

Kodo and kutki may be said to be the staple food of the hill tribes of the Satpuras, *i.e.*, of the hills of Nimar, Hoshangabad, Narsinghpur, Betúl, Chhindwara, Seoni, Balaghat, Mandla, and Bilaspur; also of the poor strip of country in Jubbulpore, Damoh, and Saugor lying against the Bundelkand States. Its critical time is from the third week in July to the third week in August, when, if no rain falls, or there is an inadequate supply, the crop is lost; much of this is cultivated in dhya or bewar fashion.

The following extracts from the Mandla Settlement Report show the nature of the cultivation:—

"As the dhya cultivation comprises no small amount of the general area, I will endeavour to describe it clearly. With no other instrument of agriculture but the axe and a small sickle (hussia) it is astonishing to see the extent of clearing one village of Bygas makes on the sides of the hills on which their village is located.

"Until lately, it was their habit to select the spots for their dhyas with an utter disregard for all the rules of forest conservancy.

"Where the trees are largest and most numerous there will the Byga resort, and in the cold weather months will cut down sufficient wood to cover pretty closely the whole of the area he means to bring under cultivation. In May and June, just before the setting in of the rains, this wood and the brushwood in which it has fallen is set fire to, and almost before the fire is out the Bygas may be seen taking up the ashes and spreading them over the whole surface of their field.

"This is done either with a bundle of thorns, or with long bamboos, until there is a superstratum of about an inch of ashes spread over the ground. In these ashes they sow kodo (*paspalum frumentaceum*), kutki, and occasionally a poor specimen of rice called here 'bygunna.' From being on the side of a hill, the ashes are cut up into furrows by the action of the rains, and often much of the seed must be washed away altogether, but sufficient seems to remain for the Byga's wants. When sown, the field is fenced round very roughly and strongly, small trees being felled so as to fall one on to the other. The interstices are filled in with bamboos, and the boughs are carefully interlaced, so that the smallest kind of deer cannot effect an entrance. In addition to this, where there is any danger of the crops being eaten up by wild buffaloes or bison, which push through any ordinary fence, the Bygas bury a line of broad-bladed spears, called 'dansas,' in the ground, at about the spot where these beasts would land if they jumped the fence. They then watch their opportunity, and sneaking round to the opposite side, give a series of yells which send the cattle off terrified over or through the fence; generally more than one is wounded and often one killed on the spot; the rest once started, make straight away, and never visit that field again. In the fences round these 'bewars,' as these patches of cultivation are called, are usually two or three cunningly contrived traps for small deer, something on the principal of the old figure of 4, and several nooses for peacocks, hares, &c. These the Byga carefully examines every morning, and great is his delight when occasionally he finds a panther crushed under one of the 'figure of 4' traps. One of these bewars lasts the Byga at the outside three years. He usually leaves sufficient wood on the ground the first season to last for a second season's burning. The third year, if by chance he should make up his mind to stick to one field for so long, his labour is much enhanced, as he has to cut and dry the requisite wood at some little distance, and lay it over his field. In addition to this, the out-turn of the crops falls off every year, so that altogether the Byga has every inducement to change the *locale* of his cultivation, and where no restriction has been put on his movements, as a rule, he does so.

"It takes six or seven years before one of these old 'bewars' is sufficiently covered with wood again to make it worth the Byga's while to cultivate it a second time. In three years it is probably densely covered with brushwood, but this, if burnt, leaves so little ash that it has to be largely supplemented with timber; and as this has been previously cut all round the clearing it becomes a work of supererogation to take up one of these old plots before the wood has well groven, when other and more suitable land is available.

"It is much to be regretted that these people have caused such devastation in the forests, and it is really difficult to believe that so few people could sweep the face of the earth so clear of timber as they have done in the Byga country *par excellence* at the head of the Burher and the rivers which water the Partabgarh Taluka. If carefully looked after, the injury they cause to the forests there may be made more negative than positive, by placing certain restrictions on their wandering habits; and keeping them within the boundaries now fixed for them, which have been selected so as to allow them wood enough for their wants, but in situations where, owing to their previous devastations or the inaccessibility of the locality, the timber is of little value. These arrangements were sanctioned in March 1868, and I sent out the superintendent to see that they were properly carried out in Partabgarh and Mokutpore. The result was that 7,794 acres of land have been allotted to these people in 12 villages; the amount of their present cultivation roughly measured is 1,431 acres, so that a little over five times its area of cultivation has been allotted to each. Formerly the areas claimed by these people amounted to over 30,000 acres. They have expressed themselves quite satisfied with the arrangement made for them. But if the country were opened up to trade and the value of money became more known, the Bygas would soon learn wherein their own advantage lay, and would do, as their brethren have done in other parts of the country, drop the axe and take to the plough; but until we have shown them what benefit it is to them, and in fact have created wants which their present primitive habits will not enable them to provide for, we cannot expect them to change their nature."

Rice is the staple food in Sambalpur, Bilaspur, Raipur, Bhandara, Balaghat, Eastern Chanda, and, with a rabi joár and other grains, in the sub-division of Sironcha.

The lighter and higher grounds are sown late in June and early in July. This is harvested late in September and early in October.

Its critical time is August; a total cessation would destroy the crop, an excessive fall would certainly not injure this crop. It depends on the rainfall between say 21st August and 8th September to determine whether the out-turn will be well above or far below

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CENTRAL PROVINCES.

Mr. Nicholl

the average, unless indeed this period shall have been preceded by copious and continued rain.

The richer and lower grounds are tilled by transplantation from the seed beds early in August, the seed beds having been sown at the beginning of the monsoon. Such areas as cannot be supplied from the seed beds by transplantation are sown broadcast with seed grain already brought to the germinating point. This is done early in July, as soon as there is a sufficiency of rain water accumulated in the prepared fields. This crop is harvested in November. This requires heavy rains during the transplanting period, early in August. Cessation of rain at this time would be very destructive. Showers through September will suffice up to the end of the month, when the heavy eastern rains are anxiously looked for, as they determine the abundance or scantiness of the outturn.

Wheat is the staple crop of Hoshangabad, Narsinghpur, the southern and western portions of Saugor, most of Damo, the Nerbudda water-shed portion of Jubbulpore, Seoni and the rest of Mandla, and the central parts of Chhindwara and Betul.

Mr. Elliott, in his Hoshangabad Settlement Report, gives the best possible description of the influences of the season at the time of sowing :—

"The prospect of the crop depends very much on the weather about sowing time. The most favourable case is when the rains last till about the middle of September or the beginning of kowar, so that the bukhurni is over by the daserah, and a smart shower falls at that time; when this happens there is plenty of time to cultivate and sow all the land before it becomes too dry. The next best case is when the rains continue later, till the end of September, and then the ploughing and sowing are got over at once, escaping from the great heat of September. The worst case is where the rains end early, and no after-showers fall. Thus in 1863 the rains stopped on the 5th September; the cultivators hoping for more rain, would not begin the bukhurni at once, so that by the time the fields were ready for sowing (early in October) they were nearly dried up.

"A very heavy shower of three or four inches fell early in October, and set things right again, producing a late but superior crop ; but in the few villages along the river where it did not fall half the land was left unsown. In 1864 the rains ceased on the 15th September, and sowing was commenced about the 17th October : the light lands were a good deal dried up ; but about the 25th October a smart shower fell : and the season thus corresponded to what I have described as the best possible case.

"If, however, the rain had fallen directly after sowing, it would have been injurious, as then the surface soil becomes a paste, which presently hardens, so that the weak germ cannot penetrate through it."

In the southern districts the cultivators prepare their fields, and defer the sowing till after the usual time for the hathi or elephant showers coming from the south-east. These showers are uncertain. When they do not come by the 10th October the seed is at once sown. If these showers should come after the seed is sown, the fields will be re-ploughed and sown again. From this time till the middle of December clear weather is hoped for. If moderate rain then fall, followed by clear weather, the crop will be good, unless injured by hail. If the fall be anything but moderate, and if it be succeeded by a continuance of cloudy weather, blight or rust will be apprehended. But average rabi crops may be expected if there be no rain, provided that dew falls abundantly in December. If there be no rain and no dew, the out-turn will probably be below an average.

The wheat seasons are fully a fortnight earlier both for sowing and harvesting in the southern districts. In the Nerbudda Valley sowings continue up to the middle of November. From the day of sowing 4½ months are calculated to the day of reaping.

Mr. Fernandez.

FOREST PRODUCTS USED AS FOOD BY THE HILL TRIBES OF THE SATPURA HILLS.

The hill tribes of the Nimar, Hoshangabad, and Betul districts depend for a considerable portion of their food supply on forest fruits and other produce. Of these the flower and fruit of the mhowa tree are the most important, both on account of their highly nourishing properties and the large quantities in which they are consumed. Except when variety is required, or when the ber is still in season, the sun-dried mhowa flower forms a part of every meal, being eaten with boiled rice and the lesser millets or kneaded with dough to make bread. The proportion of sugar in the fleshy corolla is exceedingly large, combined with a small quantity of some nitrogenous compounds. This gives it great nourishing powers, and its general use effects a considerable saving in the consumption of cereals. I am unable to state exactly what this saving is, but it cannot be put down at less than 20 per cent., after making allowance for the increased quantity of the cereals consumed on account of the improved flavour imparted by it to the latter. The seed of the mhowa, or rather the cotyledons of the seed, contain about 25 per cent. by weight of oil. This oil is expressed by the hill people themselves by a very simple process. The testa or skin being removed, the seed is pounded and boiled, wrapped up in two or three folds of an old blanket and pressed between two boards. Besides being used for lighting, the oil forms a very inexpensive substitute for ghi, which it resembles in colour and consistency. Taking the flower and the fruit together, a provident family can live well and save at least 30 per cent. of cereals by laying in a sufficient supply of those products for the year's use.

As already mentioned, the ber also enters largely into the food of the hill tribes. Besides being eaten as an ordinary fruit, it is stoned and mashed into a kind of thick sauce or purie with a little water, salt, and Cayenne pepper, and used with bread or boiled cereals. For this latter purpose, the ber is of course as good dried in the sun as when broken off the tree, and thus an inexhaustible supply of it may be stored up every year irrespective of drought and scarcity.

The roasted seed of the mahol (*Bauhinia Wahli*), a common, hardy, gigantic creeper, is eaten with great relish, many making a complete meal of it. This bean is in season from January to February. The whole bean is roasted in hot embers until the woody pod is nearly charred through. The seed has not a disagreeable taste, but is slightly astringent, and highly indigestible for those unaccustomed to it.

During the rains and cold weather, the tubers of some wild species of arum, curcuma, and yam are extensively eaten, and can form a complete substitute for the cereals, at least for a limited period.

The above are the more important forest products which make up a considerable part of the diet of the hill tribes here. There are many other trees and shrubs of which some part is edible, and which are used by these people during their respective seasons. Some of them are given in the following list, which I have drawn up with a few summary remarks :—

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CENTRAL ROVINCES.

Mr. Fernandez.

Name of species.	What parts eaten.	How eaten.	Season.
Argyreia uniflora	Flower bud	Cooked	May to August.
Moringa pterygosperma	Flowers	Do.	January to April.
	Young leaves	Do.	March to April.
	And leaf buds	Do.	Do.
	Tender fruit	Do.	Do.
Indigofera pulchella	Flowers	Do.	January to June.
Bauhinia variegata	Flower buds and tender leaves	Do.	February to March.
Do. purpurea	Flower buds	Do.	December to January.
Do. malabarica	Tender leaves	Do.	April to November.
Randia dumetorum	Young fruits	Do.	June to July.
Gardenia turgida	Do.	Do.	May to June.
Do. latifolia	Fruit	Do.	November to February.
Ficus infectoria	Young shoots and fruit	Cooked and uncooked	May to June.
Do. religiosa	Do.	Do.	April to May.
Do. glomerata	Fruit	Do.	Do.
Do. indica	Do. (in times of scarcity)		Do.
Do. hispida	Do.	Uncooked	Do.
Do. cordifolia	Do.	Do.	May to June.
Phylanthus emblica	Do.	Raw and cooked	October to March.
Phœnic sylvestris	Do.	Uncooked	March to April.
Cordia Myxa	Do.	Do.	May to July.
Diospyros melanoxylon	Do.	Do.	March to May.
Buchanania latifolia	Fruit and seed	Do.	April to May.
Alangium Lamarckii	Fruit	Do.	May to July.
Eugenia Jambolana	Do.	Do.	June to July.
Schleichera trijuga	Do.	Do.	Do.
Ægle marmelos	Do.	Do.	October to April.
Grewia polygamâ	Do.	Do.	November to December.
Do. lœvigata	Do.	Do.	Do.
Do. vestita	Do.	Do.	August to November.
Do. asiatica	Do.	Do.	April to May.
Flacourtia Ramontchi	Do.	Do.	May to June.
Ulmus integrefolia	Seed	Do.	May to July.

BERAR.

r. Dunlop.

BERAR.

Jowari is the staple food of the province. In 1876-77 it occupied 35·10 per cent. of the total cultivated area of the province, and 68·31 per cent. of the area cultivated with food grains. It is sown in the end of June or beginning of July, as soon as the cotton sowings, which first receive attention, are completed. It is reaped in the end of November or beginning of December. From the time it is sown, until the end of September, any prolonged period of dry weather is hurtful to jowari. It specially requires good rain in August. The best crops of jowari are raised when the monsoon rains are equitably distributed over the months from June to September, and aggregate 28 to 35 inches.

Prolonged wet weather, such as we have had this season is damaging to the jowari in low lands.

The jowari crop is again sometimes damaged in autumn by unseasonable rain falling at a time when the heads of grain are ripening, the effect of which is to blacken and rot the grain.

Wheat is the next most important crop. It occupied in 1876-77, 8·39 per cent. of the total cultivated area.

It is everywhere a cold weather or spring crop. A full south-west monsoon is necessary to prepare the soil for it, and late rain improves it.

The general facts are that the poor people eat millet in the inland districts, and nagli, wari, &c. on the coast and Ghats, while the richer classes eat wheat and rice. Of the millet, bajra is grown on the drier and lighter soils, and jowari on the richer. The very poor eat inferior grains, such as kodra inland and harik on the coast. Rice is largely grown in the coast district, and along the top of the Ghats, because the early and heavy rainfall suits it. In the northern inland districts, jowari and bajra grown (with cotton) as a kharif crop, require rain for sowing and germination in June and July, after that, timely showers until the end of August, when a good fall is needed to bring the grain into ear. It is harvested in October or November. Wheat depends on the later rain (September and October), and if the ground has been well saturated at the sowing, it ripens with the aid of the dews only in November and December, and is harvested in February or March. In the East and South Deccan jowari is grown largely as a later crop, in dependence of the heavy rainfall usual there in September and October. Generally a moderate rainfall is sufficient, if it is well timed, to meet the requirements above indicated, and excess or failure at any period injures the crop.

BOMBAY.

Mr. Peile.

BOMBAY.

The collectors' answers are as follows:—

Kaira.—The staple food is bajra and the coarser millets. Also rice, bajra, and kodra are sown as soon as the ground is well saturated, in June or July. They require rain about three weeks after the plants are above ground, and later to bring them into ear. Rice and bhoota require heavy rain early in the season before transplantation. When that is successfully done, they can bear almost any amount of rain. Heavy rain damages the millets after they come into ear. Want of rain in June, July, and August causes them to burn up, but bajra can be re-sown up to August, and jowari even later.

Broach.—Jowari is the principal food grain. It is partly sown in June and harvested in October, but the main crop is sown in August and harvested in February. Wheat is sown in September or October, and ripens in March. Jowari is the staple food in the black soil and bajra in the light soil villages. The failure of the early rain would injure the bajra, and of the later rain the jowari. The later rain is supplemented by heavy dews from October to December. Cold following on an excessive rainfall (month not given) destroyed the crops (cotton and jowari?) in A.D. 1835.

CHAP. I. QN.

BOMBAY.

Mr. Peile.

Surat.—Rice, jowari, bajra, wheat, nagli, and kodra are the food grains. All these, except wheat, are sown in June or July, and rice is harvested first, then bajra, and jowari in December. Wheat is sown in September or October, and harvested in March. The rice will fail unless there is a copious early fall. Early and timely rain in June, July, and August is needed for bajra and jowari, and later rain for wheat and gram.

Thana.—Rice, nagli, and kodra are the staple food grains. Rice is sown at the beginning of the monsoon (June). When the plants are a foot high they are transplanted from the nursery to the field. Towards the end of October the crops are reaped. Thus rain is needed in June, and a copious fall in July at the time of transplanting. After that light rain and sunshine, and again a good fall in September. Nagli requires a similar rainfall. Any inversion of these rainfalls injures the rice.

Colaba.—Rice is the staple food, with nagli and wari for the poor. Rice is sown early in June and harvested in October. Nagli the same. They require heavy rain from June 15th to August 15th.

Khandesh.—Bajra, jowari, and wheat are the staples. Jowari is sown early in July (according to the rain) and harvested in November. Bajri is sown in the latter half of July and harvested in October. Wheat is sown in the latter half of September and harvested in January. Jowari and bajra require good rain to make the seed germinate, then timely showers until about three weeks before harvest, when good rain is required to make the heads fill. All the cereals are liable to injury from heavy rain in their flowering season.

Nassick.—Bajra is the staple food—the facts are the same as those for Khandesh. Wheat and gram are sown in October and harvested in February, mostly for export. They want rain in December to give a good crop. Rice is grown on the Ghats, is sown in June and reaped towards the end of October. Nagli is the staple food of the people near the Ghats. It requires less moisture than rice, but is a poor grain.

Ahmednagar.—Bajri and jowari are the staple food grains. On the west Ghats rice and nagli are grown. Wheat is grown for the rich. Bajri is sown in June or July and reaped in November. Wheat, jowari, and grain are sown in September and reaped in February or March.

Poona.—Bajra and jowari are the staple food of the poor, and wheat and rice of the rich. Bajra, jowari, and rice are sown in June or July, harvested in October and November. Wheat is sown in November and reaped in February and March. Rain in August is essential to the kharif, and showers in November and December for the rabi. Excessive or very scanty rain in August injures the kharif.

Sholapur.—Bajra and jowari are the staple food. Bajri is sown in June or July, and jowari as a rabi crop (September or October), and harvested in March. If the ground is well saturated when jowari is sown in October it does not require much more moisture.

Satara.—Jowari and bajra, and in the western talukas rice and nachni, are the food grains. Jowari and bajri are sown in June, jowari also as a rabi crop in October. Rice and nachni in June. These require heavy rain at sowing and transplanting. The rabi jowari requires rain at the end of September, and showers in December.

Kaladgi.—Jowari and bajra are the staple food. Bajri is grown as a kharif crop, and jowari as both kharif and rabi. The times of sowing and harvesting are those given above. The kharif requires rain in June, July, and August, and is injured by heavy rain after it is in ear. The rabi requires rain in August and September.

Dharwar.—The staple food is rice in the west border of the district, and jowari in the rest. Rice is sown in May and reaped in November. Early jowari is sown in July and reaped in November or December. Late jowari is sown in September and reaped in February. For the rice and early jowari rain is needed in June and July. For the late jowari a few heavy falls in October. Heavy rain in October causes mildew in the early jowari. Heavy rain in December causes blight in the wheat.

Ratnagiri.—Nachni, wari, and harik are the food of the poor. Rice is grown chiefly on the coast. The crops are divided into early and late. Heavy rain is necessary in June for sowing, and in July for transplanting. Showers and sun in August and September. A good fall at the end of September. The late crops further require a good fall in the middle of October. A late monsoon injures the coast crops, and failure of rain in October the hill crops.

Canara.—Rice is the staple food of the upper, and ragi of the lower, classes. They are both sown in June or July and harvested in October and November. In low lands a second crop of rice is sown in December. Rain is needed for the rice in June, July, August, and September.

SINDH.

SINDH.

Col. Ha

The grains which form the staple food of the people of Sindh are joar, rice, bajra, wheat, mung (dhâl).

The first three being kharif products, are sown in June and harvested from October to December. The crop is secure whether rain fall or not; but it is immensely improved in quantity and quality by rain in July and August. Rain coming later than the early part of September is injurious, causing smut and blight. Wheat and other rabi crops are much more dependent on rain than those of the kharif. A timely fall in January and February makes a vast difference in the yield. Cloudy weather late in the rabi (the end of February and March) is always followed by blight. This with frost and premature setting in of hot winds is what proves most injurious to the rabi crops.

MADRAS.

MADRA

Board
Revenu

The staple food grains of the presidency are—
Paddy (Oryza sativa).
Cholum (Sorghum vulgare).
Cumboo (Penicillaria spicata).
Ragi (Eleusine coracana).
Varagu (Panicum Miliaceum).
Korra (Panicum Italicum).
Samai (Panicum miliare).
Different kinds of pulses.

The following table shows those grown in each district, and the proportion of cultivated area under each to the total area under food grains. The percentages have been calculated with reference to Ryotwar and Inam lands only, which form the bulk of the lands in the presidency, and for which alone information is available, but it may be generally presumed that the same proportion is preserved throughout all the lands in the district.

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MADRAS.

Board of Revenue.

Districts.	Staple Crops.	Proportion of Cultivated Area under each to Total Area of Food Grains in each district.
		Per-centages.
Ganjam - -	Paddy - -	69
	Ragi - -	19
Vizagapatam -	Paddy - -	43
	Cumboo - -	28
	Ragi - -	11
Godavari - -	Paddy - -	69
	Cholum - -	9
	Pulses - -	12
Kistna -	Paddy - -	20
	Cumboo - -	9
	Varagu - -	8
	Pulses - -	16
Nellore - -	Paddy - -	24
	Varagu - -	8
	Cumboo - -	6
	Pulses - -	6
Cuddapah - -	Cholum - -	31
	Cumboo - -	24
	Paddy - -	10
	Ragi - -	8
	Korra -	7
Bellary - -	Cholum - -	40
	Samai - -	23
	Cumboo - -	8
	Paddy - -	5
	Ragi - -	3
	Pulses - -	17
Kurnool - -	Cholum - -	50
	Korra - -	19
	Varagu - -	8
	Cumboo - -	5
	Paddy - -	4
	Pulses - -	9
Chingleput -	Paddy - -	78
	Varagu - -	9
	Ragi - -	7
North Arcot -	Paddy - -	45
	Cumboo - -	15
	Ragi - -	15
	Varagu - -	10
	Pulses - -	7
		Per-centages.
South Arcot -	Paddy - -	40
	Cumboo - -	21
	Varagu - -	18
	Ragi - -	14
Tanjore - -	Paddy - -	79
	Varagu - -	9
	Cumboo - -	4
Trichinopoly -	Paddy - -	22
	Cumboo - -	18
	Varagu - -	18
	Cholum - -	17
	Ragi - -	12
	Pulses - -	8
Madura -	Cholum - -	22
	Paddy - -	19
	Cumboo - -	13
	Ragi - -	12
	Samai - -	12
	Varagu - -	10
Tinnevelly	Cumboo - -	25
	Paddy - -	24
	Samari - -	17
	Cholum - -	9
	Varagu - -	7
	Ragi -	6
	Pulses -	10
Coimbatore -	Cumboo - -	36
	Cholum - -	30
	Ragi - -	10
	Paddy -	4
	Pulses -	10
Nilgiri - -	Korra - -	37
	Samai - -	17
Salem - -	Ragi - -	28
	Cumboo - -	25
	Paddy - -	9
	Cholum -	5
	Samai -	5
	Pulses - -	18
South Canara -	Paddy - -	91
Malabar - -	Paddy - -	98

MYSORE.

Ir. Lacey.

MYSORE.

The staple food of the Kanarese people of the Bangalore District is ragi. The Tamalians and others who migrated from the coast and settled here, and the higher castes of Hindus, live on rice. Ragi is sown in July and reaped in November or December.

Early paddy is planted in January or February and reaped in June; and that the late paddy is sown in June or July and reaped in January. Horse-gram (kulthi) is sown in September and reaped in January. It is extensively grown for sale, but is not used as an article of food.

Potatoes and sweet potatoes and maize are also cultivated in gardens, and depends upon the supply of water in the wells. These are also used as articles of food, but are not considered sufficiently important to form a meal of themselves.

Avare or beans, and togari or dál, are sown and reaped with the ragi.

Heavy soaking rain is essential when the lands are to be ploughed and prepared, and in order to fill the tanks, light and frequent rains with occasional heavy showers are required when the ragi is growing. The horse-gram requires rain when sown, but it matures under the influence of the heavy mist usual in December and January. If the tanks have a fair supply of water, paddy requires but little rain. The most critical time at which rain is essential for the ragi crop appears to be in the month of September. A failure of rain in that month blights the crop and hinders the sprouting forth of the ears.

Excessive rain injures the ragi crop when sown and in the earlier periods of its growth; but after it has attained the height of 4 inches no amount of rain will be injurious. Dry weather will, however, be required at harvest time, which we may generally reckon on.

AJPUTÁNA.

ptain Barr.

RAJPUTÁNA.

Jodhpur and Jesalmir.—Wheat, bajra, moth, barley, maize, joár, and moong form the staple food of the people.

Bajra, moth, joar, maize, and múng are the rainy crops, these are generally sown in July and reaped in November. An immense area of the sandy tracts is sown with bajra, the rain sinks into the sandy soil and but little of it escapes, the seed is sown very deep in the low ground between sand hills, and here, with but a few showers, the crop grows readily and produces in a good year a plentiful harvest. Rain is most necessary to the kharif crop during the month of August, an excessive rainfall has not been known in this district, or at any rate is not within the memory of man. A failure of rain during August and September and an exposure, of the young shoots in a sandy soil to the full blaze of the sun in those months, causes a destruction of the crop.

The rabi crops, consisting of wheat and gram, are sown in October and November and are harvested in April and May, the critical period, or rather that in which rain is most beneficial to these crops, is from the end of December to the middle of January; a failure of rain at this reason does not, however, necessarily entail a failure of crops, for in the first place

Chap. I. Qn.

Rajputána

Captain Bar

wheat and gram are for the most part grown only within the limits protected by the irrigation, alluded to above, obtained from the Luni; and secondly, in years of abundant rainfall during the monsoon months the land used for the rabi retains sufficient moisture to bring the crop to harvest, but rain during the cold season is most valuable, and after seasons of partial failure of the south-west monsoon, has frequently been the means of saving large areas from famine.

CENTRAL INDIA.

Central India.

Mr. Wingat

—	Staple Food.	Sown.	Harvested.	Rain required.	Rain injurious.
Bhopal -	Wheat -	November -	February -		
	Joar -	June -	November -	June, July, and September.	Heavy in August is injurious.
	Rice -				
	Makka -		September -		
	Bajri -		November -		
	Mung -				
Baghelkhand* -	*Kharif.*				
	Kodoo -	June-July -	Oct.-Nov. -	June-July: Oct.-Nov.	Excess bad.
	Joar -	June -	November -	June -	August.
	Sawan -	June -	August -	June.	
	Kakun -				
	Murwa -				
	Bajri -	August -	Oct.-Nov. -	August and end of September.	Much rain bad.
	Coarse Rice -	June -	November -	June and Sept. -	August.
	Rabi.				
	Gram -	October -	April -	January -	February.
	Muttur -				
	Jow -				
	Mhowa -				
W. Malwa -	Indian-corn -	June -	September (end)	June and Aug.	Excess in June and July, and in September for Indian-corn, or November for joár.
	Joar -		January.		
Rutlam -	Indian-corn -	June -	September -	- -	Excess hurts kharif, benefits rabi.
	Joar -		November -	- -	
	Wheat -	October -	April -	December -	January, February.
Deputy Bheel Agency (Mánpur).	Rice -	June -	September -	- -	Excess July, August, hurts kharif and benefits the rabi.
	Joar -		December -	- -	
	Indian-corn -		September -	- -	
	Tur -		December -	- -	
	Wheat -	October -	April -	Winter Rain -	Excess bad: or deficient autumn and no winter rain.
	Gram -		March -		

N.B.—The higher classes eat rice, wheat, and dal (chiefly *urd*, *arhar*, and *mosur*).

HYDERABAD.

Hyderabad.

Moulvie Mahdi Al

In the Telingana districts, rice and joar, and in the Mahratta country, bajri and joar, form the staple food of the people. The poor people also use lachna, sawan, kodru, kungni, and burrug, and the rich use wheat.

Telingana.

Joar.—Sowing commences in Mirg Sira and lasts till Punavis (*i.e.*, 6th June to 17th July). The crop is reaped from Swati to Anuradha (*i.e.*, 22nd October to 30th November). Rain is essential at the time of sowing up to a little before the full development of grain, a period of two months, after which in Magha and Uttra, that is, at the reaping of the crop and a little before, rain is injurious. Excessive rainfall a month after the seed has been sown, that is when the seed has germinated, blights the crop. From this cause proceeded the chief injury in 1288 Fusli (1878). Joar requires little rain and is much injured by excessive wet.

Bajra.—For this crop similar remarks apply. It may be added that fall of rain at the time when the crop is in blossom completely destroys it.

Lachna.—Sowing takes place from Ardra to Punarvas (*i.e.*, 20th June to 17th July), and reaping from Vishakha to Anuradha (*i.e.*, 4th November to 30th December). Rain is necessary before sowing and for the development of this grain. Wet is injurious up to a week after sowing and a little before the crop is reaped.

White joar is sown between Hast and Swati (*i.e.*, 25th September and 3rd November), and reaped between Shatvarka and Purbabhadripada (*i.e.*, 17th February and 15th March). Rain is injurious with this crop up to two weeks after sowing, and becomes necessary a month after that (*i.e.*, in Swati and Vishakha). Failure of rain, however, causes no appreciable injury to crops cultivated in regar soil.

Wheat is sown between Chittra and Vishakha (*i.e.*, 19th October and 17th November), and reaped between Shatvarka and Purbabhadripada (*i.e.*, 17th February and 15th March). The remarks as to rain given under white jowar apply to this also.

Abi paddy is sown between Ardra and Ishlesha (*i.e.*, 20th June and 14th August), and reaped between Swati and Jeshtha (*i.e.*, 22nd October and 13th December). Rain is constantly necessary for this rice crop excepting in Swati, when it is injurious. When there is a failure of rain the crop is irrigated from tanks and wells.

Tabi paddy is sown between Purva Asarh and Shervan (*i.e.*, 27th December and 3rd February), and is reaped between Bharni and Rohini (*i.e.*, 25th April and 5th June). This crop requires constant irrigation, which is carried on from tanks and wells.

Kodru, kungni, burrug, and savan are sown in the Ardra and Punarwas naxtrâs, and are harvested in

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YDERABAD.

Moulvie Mahdi Ali.

Hasth and Chittra (about five months after sowing). Rain is essential a little before sowing, and a week after. Rain is essential at least once a week up to the Pûrvâ naxtrâ. If a continued fall of rain occurs after sowing, for a full week, the crop is liable to be injured. Excessive rainfall during the Uttra and Hâsth naxtrâs is also injurious.

MARATWARI.

Yellow and red joar is sown between Mirgsira and Ardra (*i.e.*, 6th June and 3rd July), and reaped between Chittra and Vishakha (*i.e.*, 9th October and 17th November).

Rain is injurious up to four or five days after sowing, when the seed germinates, because earth is cast over the plants. About two months and a half after sowing (*i.e.*, shortly before the formation of the grain, say, in Ragha and Purva), rain injures the crop, because it washes the blossoms away. Rainfall in Hast and Chilra (*i.e.*, 25th September to 21st October), which is the time for reaping, also damages this crop. Moderate rainfall fifteen days after sowing is necessary and beneficial, and a failure at that time causes injury, more or less.

Bajra.—Similar remarks apply to this description of crop.

White joar is sown between Uttra and Chittra (*i.e.*, 15th September to 25th October), and reaped between Uttra Asarh and Dhanishta (*i.e.*, 9th January and 16th February). Rain is necessary for this crop a short time before sowing, and failure of rain at that period causes some injury. Rainfall at the same periods as specified under yellow and red joár is injurious. Although no rain is required for the rabi crops in general (the dews at night being sufficient to nourish them), yet rain in Anuradha (*i.e.*, 18th to 30th November), produces very beneficial results, and showers at that time are spoken of in Maratwari as Satoni ká Pané.

Wheat is sown between Chittra and Vishakha (*i.e.*, 9th October to 17th November), and reaped between Uttra Asarh and Dhanishta (*i.e.*, 9th January and 16th February). The remarks as to rainfall given under white joar apply to the wheat crop also.

Paddy (sown in ordinary land) is sown between Ardra and Punarbas.

CHAPTER I.—QUESTION 6.

What proportion of the cultivated land, and what class of crops is manured yearly, and what is the average weight of manure given to the acre (1) in land constantly manured; (2) in land occasionally manured. If there is any customary rotation of crops and fallows, state it.

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This question was referred to district officers for report, and I have appended a tabular statement in which their answers concerning manuring are summarised. The information given in this statement concerning the proportion of the cultivated area which is manured is more valuable than that relating to the amount of manure applied per acre. It is probable that the distinction between occasionally manured and constantly manured has not been understood by the various reporting officers in the same sense. And for the purposes of the question under reply it will be safer to compare the total area manured with the proportion that bears two crops annually. No land can steadily bear two crops a year which is not thoroughly well manured.

In a province such as the Punjab, with a hot climate, and a rainfall in many districts scanty, there is a natural restriction in the general use of manure well known to the native agriculturist, but not sufficiently recognised by those of us who are his critics. Even in England farmyard manure applied in dry summer seasons to light soils is apt to make the land hollow, and liable to be injured by drought.* This fact is well known to the native agriculturist. In most of the tracts where the annual rainfall is less than 25 inches (as in the Hissar Division, in the dry parts of Ferozepore, and the western portions of the Jhelum and Rawalpindi districts), the agriculturists give as a reason for not manuring their unirrigated crops, that manure, when applied, "burns them up." For example, see the entries in the appended statement against the districts of Karnál, Hissar, Sirsa, Ferozepore, Gujránwála, and the Mooltan and Deraját divisions, where next to none of the unirrigated cultivation is returned as manured.

But so far as irrigation is available in sufficient abundance, and where the rainfall exceeds 25 inches per annum, the statement gives conclusive evidence of the great value attached to manuring by the native cultivator.

Another feature of agriculture in the Punjab, which limits the use of manure, is that in the majority of districts there are considerable areas of land which almost annually receive a valuable deposit of silt. Such are the alluvial (sailáb) lands on the banks and in the beds of the great Punjab rivers, annually covered by their summer and autumn floods; and in a less degree the lands irrigated from the same rivers by inundation canals in the Lower Punjab; also the extensive areas in the Derajât Division at the mouth of the passes which drain the Suliman Ranges; the lands in the Shahpur and Jhelum districts, at the foot of the salt range, and other smaller areas in which floods annually deposit a valuable silt on the soil.

The effect of this annual deposit of fertile silt is to make manuring by so much unnecessary. An estimate of the extent to which the soil is periodically renewed by fertilising additions, which did not take these silt deposits into account, would fall far short of the truth. [The extent of sailáb land in each district is given in a statement appended to my reply to Question 4.]

The description of manure universally and almost solely used consists of the sweepings of villages and towns, human excrement, and the droppings of the village kine, flocks, and other animals. Cowdung preponderates, mixed up with broken straw and litter swept up from the stalls of the cattle.

The unirrigated lands chosen for manuring are usually those nearest the village site; and in the submontane districts each village or hamlet is surrounded with a belt of such lands. The water which drains out of the village when rain falls, carrying with it human excrement and other fertilising substances, is also usually directed on to these lands.

In the manuring of irrigated lands other considerations come into play. The manure must be carried to the lands that are irrigated. In the case of irrigation from wells, these wells are usually dotted about at a greater or less distance from the village, and the fields nearest the well being those most abundantly irrigated, and most easily watched, are

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* Wrightson's Handbook of Agriculture, page 114.

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always selected for the highest manuring. The cultivators with their families and cattle usually have sheds at their wells where they live in the busiest agricultural seasons.

As regards the amount of manure applied per acre, the weak point in the replies appended is that the varying treatment of the different crops manured is not detailed. Sugar-cane, opium, tobacco, turmeric, and vegetables are very highly manured; while to cereals a smaller quantity of manure is applied. The rate probably usually varies from 8 to 15 tons (200 to 400 maunds per acre).

Undoubtedly, in the agriculture of the Punjab the rotation of crops does not hold that prominent place which it does in that of England. That the principle is understood and applied (with a degree of intelligence which varies with the locality and class of cultivator), will be apparent from a perusal of the papers annexed to this reply; but its practice is confined to a very limited area of the most fertile and best irrigated lands.

This gives rise to the question, viz.:—*Is the absence of any such system on the great majority of the cultivated lands injurious; and is its introduction desirable or practicable?*

These are questions which have as yet received little investigation. Accustomed as we are to regard the English agriculture as the best, a system of which the prominent features are such a combination of cattle farming with agriculture as makes heavy manuring and rotations possible, the native agriculture, in which these features are for the most part necessarily absent, in the minds of most of us stands condemned without further hearing.

I believe that this conclusion is erroneous. That that system of agriculture only is scientific which is practical is the principle which guides even so enlightened a body as the Royal Agricultural Society of England. And if we duly weigh the climatic difficulties with which the native agriculturist has to contend, and the extremely limited capital which he can command, we shall I think be bound to admit that under such circumstances the prevailing systems are no despicable solution of the problem of how to get the most out of the soil without reducing its productive powers.

What may be called the normal system of agriculture in the Punjab prevails most widely in the submontane tracts, where the rainfall exceeds 20 inches per annum. It is a two-year course, principally of cereals; thus—

—	—	Months.	Crop.
Rabi -	September to April -	8	Wheat.
Kharíf {	May to June -	2	Fallow.
	July to October -	4	Millet.
Rest -	November to August -	10	Fallow with repeated ploughings.
	Total 2 years - -	24	

In September, sow wheat again, and so on. For either harvest, pulses or seed may be substituted instead of cereals, though this is more usually done in the kharíf. Mixed crops are very common, especially in the kharíf, for if the rainfall is fickle, the pulse may succeed though the millet fail, and *vice versâ*; with the wheat it is very common to sow mustard, which is pulled young and given to the cattle mixed with dry fodder; thereby supplying them with an early green crop when the frost has killed all the grass. An important feature in the millet crops is that, growing as they do to more than twice the height of wheat, a very sparsely sown crop supplies a very large amount of fodder. The area sown with kharíf crops on these lands is usually less than the area of the rabi crop, for various reasons which I cannot here explain at length. In the tracts in which this system prevails there is usually no good grazing for the cattle, and one of its principal merits is the large amount of fodder which it supplies. Its justification, as a course providing sufficiently for the periodical renovation of the soil, depends on the 10 months' fallow, and ploughing, which follows the kharíf crop. The ploughing during this fallow commences early in January, and between that date and September the land is usually ploughed over eight or ten times. So long as this is duly attended to the productive powers of the soil undoubtedly do not deteriorate. The repeated ploughings also completely clear the soil of weeds. To an observant eye nothing is more remarkable than the complete absence of weeds in September in the fields where wheat is being sown; in strong comparison with the rank growth of crop and weeds in the adjoining millet fields. The ploughings of the past nine months have killed the old weeds, and prevented the growth of new ones in the fallow lands.

This system prevails from east to west of the province, wherever a rainfall exceeding 20 inches can be relied upon, as testified in the annexed replies and extracts. Variations from it arise from one or other of the following causes: (1) the cultivation of special crops; (2) manuring; (3) a smaller average rainfall than 20 inches; (4) annual flooding by rivers; (5) irrigation.

Cotton.—Cotton is the only important instance of variation due to special crops. It occupies the ground from April to December, and is not unfrequently allowed to stand a second year, and sometimes a third, the plants in such instances being cut down to the roots at the close of each year's pickings in December.

Manuring.—Manuring on the submontane tracts makes it possible for the cultivator to omit the 10 months' fallow, and to secure two crops each year. In these tracts the lands immediately surrounding each village are, as above noted, those usually selected for cultivation in this way.

Small Average Rainfall.—When a rainfall of 20 inches cannot be relied on, we commonly find the two years' system given up, and irrigated and unirrigated lands alike for the most part yielding only one crop a year. Whether that crop will be an autumn (kharíf) crop, or a spring (rabi) crop, depends primarily on the average amount of the winter rainfall. In the Hissar Division, where that is very small, the kharíf crop greatly predominates. But in the rest of the Punjab the rabi area is usually as 6 to 4. In the Mooltan Division and in the southern half of the Deraját Division, where the rainfall is usually less than 10 inches per annum, no cultivation (with insignificant exceptions) is attempted, unless assisted by irrigation from canals or wells, or by flooding from rivers and hill torrents.

Sailáb, or lands flooded by rivers.—The fertile alluvial lands, which line the banks of the great Punjab rivers, are annually submerged or moistened by the floods caused by the summer melting of the Himalayan snows and by the autumn rains; on these it is of course usually impossible to grow a kharíf crop; and the rabi crops grown are wheat and barley on the better lands, and peas and pulses on the poorer ones.

Irrigation.—Where irrigation is obtainable, a more extensive variation of the usual course comes in. The cultivation dependent on well irrigation in the Amritsar and Jullundur divisions, and in other districts with a plentiful rainfall is exceedingly rich; sugar-cane is largely raised; and where that is not grown, two crops and more are grown every year. The cultivation dependent on canal irrigation is equally rich, so far as manure will go. The appended replies of district officers concerning the course of cultivation on the Bári Doáb Canal (Amritsar and Gurdáspur districts) and Western Jumna Canal (Karnál and Delhi) do not convey to me any clear idea of what system of cropping prevails on lands irrigated by those canals. But of the system prevailing on the inundation canals in the Mooltan Division, a very clear account is given in the replies of the settlement officers of Mooltan and Muzaffargarh.

There is no doubt that on the Bari Doab and Western Jumna canals continuous cropping has been

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attempted to the temporary injury of the soil. On the Bari Doab Canal such irrigation was to a great extent an innovation; and the people had to learn their experience. On the Western Jumna Canal, the same reason applied in part; and our revenue system was also to blame, for at the previous settlement of 1840, in many instances entire villages were assessed at high irrigated rates on their whole area, which of course left the agriculturists no resource except continuous double cropping, whether they possessed sufficient manure or not.

In concluding this answer, had the time at my disposal permitted, I would have endeavoured to estimate with some approach to exactness the areas to which each of the above paragraphs apply. But perhaps this is of the less importance, because probably in the whole Punjab less than a sixth of the cultivation is manured. In tracts where the rainfall is abundant, and where irrigation is plentiful, the cattle are not in sufficient numbers to supply manure to more than a limited area. In the tracts further south, where rainfall is scanty, manuring is injurious except on irrigated lands.

The system of cultivation is consequently mainly one under which light crops of cereals and pulses are taken in an unbroken succession from the land; either two crops in one year followed by a year's fallow, or one crop each year, thereby allowing six months interval between each crop; the crops are lighter in the latter case than in the former. It is difficult to condemn this system, because longer fallows would certainly not increase the yield of the land to the extent in which the agriculturists would be losers by the crops given up; and because in the existing circumstances of the peasantry no other resource except increased fallowing is available; on the other hand, the existing systems afford distinct evidence that, so far as irrigation and manure is available, it is intelligently applied to increase the yield of the land.

STATEMENT showing the proportion of Cultivated Land in the PUNJAB which is aided by Manure, compiled from the replies of District Officers.

[*Note.*—The data of cultivation and cattle are taken from the Administration Report for 1876–77, statements Nos. 8 and 43]. In columns 4 and 5 is given the average rainfall of those Stations in each District which have the highest and lowest averages.

Division.	District.	Average Annual Rainfall.	Description of Cultivation.	Per cent. Irrigated and Unirrigated.	Per cent. of Cultivation Manured.			Per-centage of Cultivation, which being thus manured bears 2 or more crops annually.	Population per Square Mile of Cultivation.	Stock per Square Mile of Cultivation.			Amount of Manure applied per Acre.		
					Constantly.	Occasionally.	Total.			Horned cattle.	Sheep and Goats.	Others.	To Land constantly Manured.	To Land occasionally Manured.	
														Amount.	At what Intervals.
													Mds.	Mds.	
Delhi	Delhi	25·5	Irrigated	37	27	13	40	26							
			Unirrigated	63	10	5	15	2							
			Total	100	16	8	24	11	634	192	64	9½	250	400	3rd or 4th year.
	Gurgaon	28·5	Irrigated	19	19	25	44	—							
			Unirrigated	81	2	2	4	—							
			Total	100	5	6	11	3	381	167	50	14	200	300	2nd year.
	Karnál	30·4	Irrigated	39	31	—	31	15							
			Unirrigated	61	—	—	—	13							
			Total	100	11	—	11	12	482	184	62	16	—	350 to 200	2nd year.
Hissar	Hissar	16·9	Irrigated	5	2·85	7·06	9·91	14·90							
			Unirrigated	95	—	—	—	1·16							
			Total	100	0·16	0·38	0·54	0·89	242	67	40	10	500	200	Half yearly.
	Rohtak	19·2	Irrigated	13	11	56	67	8·5							
			Unirrigated	87	15	23	38	·9							
			Total	100	2	7	9	1·88	574	160	37	10	600	450	3rd year.
	Sirsa	14·3	Irrigated	3	0·013	0·001	0·0014	—							
			Unirrigated	97	—	—	—	—							
			Total	100	—	—	—	—	140	44	84	9	40	30	2nd or 3rd year.
Umballa	Umballa	35·3	Irrigated	18	50	24	74	—							
			Unirrigated	82	8	15	23	—							
			Total	100	19	13	32	11·6	695	299	86	16	300	350	4th or 5th year.
	Ludhiána	25·3	Irrigated	17	53	47	100	—							
			Unirrigated	83	—	1	1	—							
			Total	100	9	8	17	5·55	521	239	53	11	200	100	Yearly.
	Simla	65·1	Irrigated	6	—	100	100	100							
			Unirrigated	94	—	100	100	Not known							
			Total	100	—	100	100	5·65	1,999	37	73	7	—	200	Every 3rd year.
Jullundur	Jullundur	29·8	Irrigated	33	29	30	59	36							
			Unirrigated	67	—	6	6	4							
			Total	100	10	15	25	15	758	362	56	18	225	112	Half yearly.
	Hoshiárpur	33·7	Irrigated	3	31	29	60	—							
			Unirrigated	97	5·8	2·8	8·6	—							
			Total	100	7	4	11	16	726	238	99	13	300 to 700	—	
	Kángra	125·6	Irrigated	27	41	20	61	64							
			Unirrigated	73	—	—	—	10							
			Total	100	11	6	17	27	790	366	388	6	150	55	Before sowing.

STATEMENT showing the proportion of Cultivated Land in the PUNJAB—*continued.*

Division.	District.	Average Annual Rainfall.	Description of Cultivation.	Per cent. Irrigated and Unirrigated.	Per cent. of Cultivation Manured.			Per-centage of Cultivation, which being thus manured bears 2 or more crops annually.	Population per Square Mile of Cultivation.	Stock per Square Mile of Cultivation.			Amount of Manure applied per Acre.		
					Constantly.	Occasionally.	Total.			Horned cattle.	Sheep and Goats.	Others.	To Land constantly Manured.	To Land occasionally Manured. Amount.	At what Intervals.
Amritsar	Amritsar	23·1	Irrigated	39	41	20	61	27					Mds.	Mds.	
			Unirrigated	61	—	—	—	—							
			Total	100	16·13	7·87	24	10	1,018	179	44	18	100 to 450	20 to 90	2nd or 3rd year.
	Siálkot	39·0	Irrigated	50	9	29	38	10							
			Unirrigated	50	4	7	11	2							
			Total	100	7	18	25	6	758	352	87	17	256	320	3rd year.
	Gurdáspur	30·9	Irrigated	16	27	9	26	7							
			Unirrigated	84	8	7	15	—							
			Total	100	11	7	18	1	549	146	79	10	200	250	3rd year.
Lahore	Lahore	18·5	Irrigated	37	18	10	28	10							
			Unirrigated	63	—	—	—	—							
			Total	100	6	4	10	4	411	95	56	10	800	200	Yearly.
	Ferozepore	20·0	Irrigated	14	20	10	30	20							
			Unirrigated	86	—	—	—	—							
			Total	100	2·84	1·42	4·26	3	276	86	33	9	550	750	2nd year.
	Gujránwála	26·3	Irrigated	70	9	3	12	1							
			Unirrigated	30	—	—	—	—							
			Total	100	7½	2½	10	0·70	637	180	67	12	200	200	Time of sowing.
Rawalpindi	Rawalpindi	31·5	Irrigated	2	86	14	100	100							
			Unirrigated	98	3	3	6	3							
			Total	100	5	3	8	5	546	105	116	25	300	155	1st and 2nd year.
	Jhelum	18·6	Irrigated	3	84	43	77	100							
			Unirrigated	97	5	5	10	60							
			Total	100	5	7	12	69 per cent. of column 8.	348	182	66	13½	300	120	2nd year.
	Gujrát	29·2	Irrigated	13	20	14	34	2							
			Unirrigated	87	15	5	20	—							
			Total	100	14	8	22	0·26	560	185½	62	13	160	100	Previous to sowing.
	Shahpur	13·0	Irrigated	64	2	3	5	2							
			Unirrigated	36	—	—	—	1							
			Total	100	1	2	3	1	857	288½	278	44	160	160	2nd or 3rd year.
Mooltan	Mooltan	6·1	Irrigated	79	Cannot be stated.										
			Unirrigated	21											
			Total	100					582	171	319	28	200	—	Annually.
	Jhang	10·3	Irrigated	69	20	7	27	5							
			Unirrigated	31	—	3	3	—							
			Total	100	12	7	19	3	681	625½	629	65	160 to 200	120	2nd year.
	Montgomery	8·7	Irrigated	62	9	12	21	1							
			Unirrigated	38	—	—	—	3							
			Total	100	6	7	13	2	596	367	413	43	160	160	Ditto.
	Muzaffargarh	6·1	Irrigated	65	89	—	89	Not known.							
			Unirrigated	35	—	—	—								
			Total	100	46	—	46	—	476	230	168	30	1,400	—	—
Deraját	Dera I. Khan	8·0	Irrigated	32	53	—	53	Not known.							
			Unirrigated	68	2	—	2								
			Total	100	18	—	18	—	547	186	476	33	—	—	—
	Dera G. Khan	7·2	Irrigated	57	6	2	8	Not known.							
			Unirrigated	43	—	—	—								
			Total	100	3	1	4	—	455	76	60	16	75	40	2nd or 3rd year.
	Bannu	12·0	Irrigated	15	15	12	27	15							
			Unirrigated	85	—	—	—	—							
			Total	100	2·22	1·78	4	2	392	220	73	57	15 to 20 donkey loads.	—	Before sowing.
Pesháwar	Pesháwar	12·9	Irrigated	25	9	15	24	38							
			Unirrigated	75	—	1	1	—							
			Total	100	2	4	6	10	369	95	58	7	400	320	15 or 20 days
	Kohát	20·2	Irrigated	38	Cannot be stated.										
			Unirrigated	62											
			Total	100				4	976	288	337	33	300 to 400	153	Half yearly.
	Hazára	46·3	Irrigated	10	35	26	61	35							
			Unirrigated	90	12	6	18	12							
			Total	100	13	9	22	14	544	319	242	16	250	200	Yearly.

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*Except Rawalpindi, the countries Trans-Indus, and the hill districts of Kot Kángra and Simla, the face of the country may be said to be one uniformly level plain, varied only by depressions several miles in breadth forming the valleys of the five rivers which flow through the plain, and unite in Sindh. These low lands are full of fine alluvial deposit, and are enriched by partial inundations every year. They are tracts of great natural fertility, and abundance of the best water for irrigation is obtained a very few feet from the surface. The ground intermediate between one basin and the other of adjoining rivers is higher, by several feet, and comparatively dry and unproductive. Portions towards the south are either not cultivated at all, or are barren, and covered with jungle and sandy wastes; yet the soil is friable, and has, for the most part, a fair admixture of loam and sand, requiring the command of water only to fit it for the highest cultivation. Scarcely a stone is to be found, and the land, when turned, resembles the finest garden soil. If schemes for the supply of water, which are understood to be in contemplation, and partially commenced, should be carried out, these parts of the Punjab may be made, in time, as productive as any other.

Nearing the hills, and eastward of a line drawn from the point of junction of the Sutlej and Beas rivers through Amritsar, Wazirabad and Jhelum, the whole surface is a scene of uninterrupted fertility and richness, to the base of the lowest range of hills which bound the plains to the north and east. A glance at the map will show that villages and towns are much more thickly clustered on this upper portion of the Punjab, and along the lines of rivers, than in other parts of the country.

Although these differences exist in the general aspect and natural capabilities of various parts of the Punjab, the cultivated products are much the same in all, wheat, barley, sugar-cane, maize, and millet being the staples of the whole country, with some cotton, hemp, tobacco, and vegetables of several sorts. These are grown at two distinct periods of the year, and are divided between the spring and the autumn crops, so named from the time at which they are reaped. The spring, or rabi crop, is sown in November, and reaped in May; the autumn or kharíf, sown in July, and cut at the end of October. In the first, the cultivation is principally wheat and barley. In the autumn are reared sugar-cane, maize, millet, and moth, with cotton and other substances above mentioned. The native methods of cultivation exhibit a good deal of industry at some periods of which perhaps the best example is their mode of preparing the land. As many as six or seven ploughings are given before wheat or barley is sown, and for some other crops considerable pains are taken; the ground is completely pulverized. Many a disparaging remark has been made on the native plough, its simplicity and lightness, and its merely "scratching the ground;" but a little reflection will show that, under the peculiar circumstances of climate and soil it is probably the best. In England the object is to break up hard masses of mould or stiff clay, and to get rid of superfluous moisture, while here, in light and tractable soil, scarcely a clod can be seen, and to preserve, in the sub-soil, the rain and moisture it imbibes at certain periods is the cultivator's greatest care. It is evident, therefore, that deep ploughing would be unsuited to such conditions. If the surface is loosened so as to allow the delicate fibres of the roots to penetrate and to secure the free access of air, it will be sufficient; to turn up the moist soil from below, and expose it to a hot sun and drying wind, would be most injurious. When the ground is in a dry open state, the drill is used in sowing, with the object of delivering the seed deep into the soil. A piece of flat heavy wood is then drawn over the furrows to smooth them and "keep in" the moisture. After rain, or in wet seasons, the seed is sown broad-cast.

A good deal of trouble is also taken in hand-hoeing and weeding some of the crops, as sugar-cane, maize, and the larger kind of millet; but only in the early stages of growth. Cultivation of nearly every sort is so crowded that it would be impossible to pursue this practice so long as it would be beneficial to do so, and great improvements might be made in the system, both in this and many other respects, which will be adverted to as we proceed.

The principal objects to which our inquiries were directed were to ascertain whether any regular rotation of crops is practised, and the principle on which it might be based. To what extent manure is used, in what state applied to the land, and the different substances resorted to; as well as an elucidation, generally, of the existing system of farm management in the Punjab. It is believed that this species of information, in a collective form, has never been before procured, and it may be considered interesting to publish an abstract of the replies in an appendix, under the head of each question to which the information refers. They have been, therefore, arranged in this manner, so that a judgment may be formed of the correctness of the inference deduced in this report, as well as on the value of the suggestions offered.

The point of first importance relates to the succession of crops, and it has been clearly elicited that no regular rotation, nor any system whatever of changes for the relief or improvement of the soil, exists. The same crops succeed each other year after year, on the same ground, and generally both of grain within twelve months. The rabi is no sooner removed than the kharí is sown; one or the other is occasionally omitted, and the ground left fallow for half, sometimes for all the year, but if no manure has been used, the same crops are annually grown; wheat and millet, wheat or barley and moth, alternately, within the same twelve months, and this invariably where the land is not artificially irrigated.

Near wells a certain system of changes is followed, but this is owing principally to the use of manure, which is almost exclusively confined to irrigated lands, and it is more to give the following crop some advantage from the dressing which has been applied to the preceding one, than from any acknowledged principle of varying the products taken from the land.

Thus maize, the larger kind of millet, and sugar-cane are both irrigated and manured, and it is customary to take a crop of wheat or barley in succession to those, which always proves a good one. On irrigated lands, which comprise probably not more than one-fifth of the area of the country, a crop of Indian corn is taken when first brought under cultivation, after which the ground is prepared for sugar-cane, frequently ploughed, and well manured. The cuttings are generally planted in March, and the crop is not cleared till February. Indian corn again succeeds at the next kharíf, after which wheat, or if desired, a second crop of sugar-cane can be again laid down. This, however does not succeed wheat, but is always after maize. Again, cotton is sown in April and cleared in December, when it is succeeded by maithee for fodder; then maize at the succeeding kharíf, after which ground will be fit for sugar-cane, and lastly wheat. The last three are manured, but cotton not so. But the absence of any definite rotation on true principles is fully established.

The cultivation, near villages and wells, consists of sugar-cane, maize, joár, cotton, and tobacco, valuable products, which cannot be brought to any perfection without manure. It is not available in sufficient quantities to fertilize the general face of the country; so that for wheat and barley it is very sparingly used and generally not at all for these, and other crops, over any considerable extent of land. The substances collected are cowdung and other animal excrement, litter, vegetable refuse, ashes, rubbish, sweepings of houses, and of yards. These are kept in heaps out-

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* Extracts from a paper on the agriculture of the Punjab, furnished to the Agri-Horticultural Society of Lahore, in September 1852, by Lieutenant-Colonel Tremenheere, of the Bengal Engineers.

CHAP. I. Q

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Lieut.-C Tremenhe

side the villages, and exposed to the weather for a considerable time before being applied as manure to the land. After one or two years, but without any definite rule, it is spread on the field at the time of ploughing. It is not thought fit for use till it has been allowed to ferment a year, but, on the other hand, it is often carried out before the straw and other substances have had time to decay. In either case it is unfit for the land, and on examination of some has shown that not more than 40 per cent. of its bulk is calculated to afford any nourishment to the growing crop. After a 12 months' exposure to a tropical sun and rains, little of its fertilizing properties remain, the nitrogen and ammonia from animal substances, most essential to vegetation, must have been long before expelled. To sugar-cane, maize, and jowár a top dressing is given when the plants are young, which is advantageous, but the principle of saving or economizing manure, and applying it in the best state, is most imperfectly appreciated, if at all. Many substances, as bone dust, lime, and others might be pointed out as available, and within the native cultivator's means and reach, to add to the exuberance of his crops; but this belongs more to a system of high farming than to a general review of the state of agriculture of this country as it now exists.

We consider it better, for the present, to abstain from such details, and to endeavour to point out the radical defects of general management. It appears that the scanty supply of ordinary manure is one of the foremost of these, and this is so intimately connected with a proper rotation of crops, that the two considerations can scarcely be separated. A further supply can only be derived, first, from the land; secondarily, from the cattle which feed on and elaborate the vegetable substances which the land has produced. No increase can occur unless land is set apart for its production. Green substances must be grown and cut continually, or roots reared for the food of cattle, which will yield manure, for it is only such substances as are consumed by them which return to and enrich the soil. Lands in the rabi, as well as the kharíf, should be devoted to this purpose, and the "racking" system of wheat every year from the same ground should be abandoned. It is certain that land treated in that manner must be greatly impoverished, and it is extraordinary that blight and famine have not been produced. If turnips, mangold wurzel, lucerne, or other suitable crops, are allowed to take their turn in cultivation, the increase of wheat, barley, or other grains, in any single harvest would be soon apparent; the produce of one season would probably exceed what it now is for two years from the same land under the present exhausting system.

But to grow more green crops and other fodder will not be sufficient so long as the careless practice remains of keeping the cattle without any economy of the manure they yield, which is a necessary consequence.

They stand, for the most part, under trees which surround the wells at which they work, instead of being kept under sheds, where litter could be usefully mixed with their dung and nothing lost. With an increase of the means of subsisting them, their numbers would increase, more land could be ploughed, and a system pursued which would be advantageous in every respect.

The point which seems next to demand attention is the excessively crowded state of all the crops. As they advance to maturity the plants are as thick as they can possibly grow, and much too close to one another to arrive at any perfection. It is impossible to observe the tangled mass of sugar-cane, the thick and scarcely penetrable fields of maize and millet, without being satisfied that each plant can neither derive sufficient nourishment from the soil, nor its proper share of light and air from above. The natural results are everywhere evident, the cane is thin and attenuated. Some of the heads of millet rise up and expand to their full size; but by far the greater number are small, low, and stunted. With maize it is much the same. The sure and only remedy for this error is to plant in rows, sufficiently far apart to allow of hoeing and weeding by the use of the plough; this method of cleaning the ground is simple, efficacious, and saves a great amount of manual labour; turning the soil near the roots during several periods of growth is most beneficial to the crop; weeds are readily and effectively removed, and every plant has room to attain its full development. This is no new suggestion. In the cultivation of maize especially, it is practised in America, in France, and other countries where land is very valuable, and has been found to answer well. There can be little doubt that it would be successful here.

NORTH-WESTERN PROVINCES.

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The most widespread system of cultivation in the North-Western Provinces and Oudh is that which divides the village area into three circles, the village site being the centre. The circle nearest the site or homestead (known as Bara, Goind, or Gauhan) is always manured, and in it the most valuable and exhausting crops are grown. The middle circle (known as the Manjha) is usually manured every other year. These two circles contain, roughly speaking, about 5 and 20 per cent. respectively of the cultivated area. The third or outlying tract only gets manure occasionally, whenever the cultivator can spare any; but it is also a common practice to pen sheep and cattle out in these fields for the night during the dry season of the year. Perhaps about 5 per cent. of the area of this tract is manured in this way every year. Thus the total area manured in any ordinary year is about a fifth of the entire cultivated area; one-twentieth part receives manure every year; one-fifth receives it every other year; and three-quarters receive it once in 10 or 15 years.

2. There are, however, several local exceptions to this system which deserve to be noticed. In the Meerut and Rohilcund divisions, wherever the land is owned by that excellent cultivating caste, the Jats, the practice is during each year to carry all the manure to a different side of the village area, from the site right up to the boundary, and thus to manure every field in the villge in turn during a course of four or five years. In the hill tracts, leaves and brushwood are trampled or ploughed into the small terraced fields to serve as manure. In the Sub-Himalayan Districts, from Dehra Dun to Gorakhpur, where the population is more scanty and the soil has been more recently brought under the plough, manure is less carefully collected and less abundantly applied than in the rest of the north part of the Gangetic Plain. South of the Jumna, in Bundelcund, the land is of a different character; it is mainly a black adhesive soil, the detritus of laterite, and is considered not to stand in need of, or to be improved by, manure; and, except for the purposes of raising garden crops, none is given to it.

3. The quantity of manure given to an acre of land depends mainly on the crop that it is proposed to raise. For ordinary crops the average appears to be about 4 or 5 tons per acre (see Mr. Wright's estimate in page 18 of his Agricultural Memo., and the district replies generally tend to coincide with this), but garden crops generally receive about 10 or 15 tons; for sugar-cane, it is reckoned that 20 tons are generally applied, and Mr. Wright's calculations go as high as 30 tons; while for

the high cultivation round Farukhabad, it has been estimated that as much as 40 tons are occasionally laid on an acre. But this must be looked on as a very exceptional case.

4. Evidence of the value set on manure in the highly cultivated central parts of the Gangetic Plain may be found in a custom of almost universal prevalence, under which an agriculturist who lives in one village, and cultivates land in another, is not allowed to remove the manure of his own cattle-shed from the area of the village in which his house is situated to the land he cultivates outside that area.

5. The crops for the raising of which the land is always manured are garden crops (including potatoes, tobacco), and opium, sugar-cane and maize. In most cases, however, the manure that is given for one crop is not exhausted by it, but a second crop follows on the same land without the application of fresh manure. Thus maize and sugar-cane are generally followed by wheat. Wheat is hardly ever grown without manure, but often it is not the wheat itself, but the rain crop that precedes it, that is manured. Barley, though less generally, gets manure in the same way. Cotton and indigo are commonly manured, but not always; they are neither of them exhausting crops, as they are not surface feeders, but have taproots which run down to the sub-soil and obtain their nutriment where ordinary cereals do not penetrate. Cotton is sometimes grown without manure in outlying land as a reclaiming crop, since its leaves in falling fertilise the ground. Indigo also is often unmanured where canal water is abundant, and is then followed immediately by wheat; but this system is found to be exhausting to the soil. For the rest, if other crops get manure, it is given not so much for the sake of raising those particular crops as for the sake of the land, which every good cultivator desires to manure in its turn as often as his means permit.

6. The chief ways in which land is manured in this province are thus described by Mr. Buck:—

(1.) From the farmyard muck-heap.
(2.) By human excreta.
(3.) By the herding of cattle or sheep.
(4.) By various nitrates.
(5.) By the refuse, leaves, or roots, of a previous crop.

These methods are thus described by him in detail.

7. The principal ingredient in the farmyard muck-heap is the dung of the cultivator's cattle, of which, however, only that part is used for manure which is collected during the rains, when the moisture of the atmosphere does not permit of its being dried. In all other months the dung is made up into round flat cakes and used or sold as fuel. The consequent loss of manure to the land is one of the stock complaints against Indian agriculture, and need not be noticed here at length. Suffice it to say that it has been proved by actual inquiry that in the neighbourhood of a town far more can be realised by the sale of these dung-cakes than from the increase in produce which would result from their application to land; and even in villages more distant from large centres of consumption their price (the best estimate we have of their utility as fuel) is generally high enough to counterbalance the advantages which could be gained from using them as manure, especially when to the ready returns of sale are contrasted the slow and uncertain returns of agriculture.

8. The heap is commenced at the end of the dry hot weather or at the beginning of the rains in a shallow saucer-like excavation somewhere in the vicinity of the cultivator's house. The open spaces near the village are generally occupied by several of the heaps in close vicinity, but each cultivator's heap is respected by the neighbours. During the rains cattle dung as well as house refuse is daily added to the heap, and as cattle are at that season more carefully housed, the quantity of dung collected per month is greater than in the rest of the year. During the remainder of the year, *i.e.*, about eight months out of the twelve, house refuse, which always includes cow-dung ashes, is thrown on the heap, so as to form an outer coating over the dung-mixed portion, which latter (the core of the heap) is considered by cultivators to be the most valuable part.

9. As a rule bullocks are housed without litter, although in one or two villages in the Cawnpore District it was found the practice to litter them in the cold weather with grass or refuse straw, which collects to some extent their liquid as well as their solid excrements. The objection to the practice in the rains is that, even where litter is available, it brings in snakes and insects, and is, on account of the fermentation and heat induced by the climate, injurious to the feet as well as to the general health of cattle. But the greatest objection of all is the absence of available straw or grass, the whole of which is used either as fodder or as fuel.

10. It may be roughly assumed that one-third of the dung is utilised as manure, while of the remaining two-thirds only the ashes ever reach the land. It has been estimated from experiments instituted in the department of agriculture that the dung of a yoke of bullocks collected during the rains and supplemented by house refuse is ordinarily utilised to manure half an acre of land, and that the total weight of the muck-heap ordinarily amounts to about 5 tons. This puts the amount of manure given to the acre at 10 tons, an outside estimate. There are but few available statistics of the number of cattle in different parts of the province; but in Cawnpore (which is a fairly average district, and where a census was taken at settlement) there were counted 485,787 head of cattle and 108,710 sheep and goats, giving one head of cattle and two sheep or goats to every three acres of cultivated land. According to these figures the amount of land manured by muck-heaps would come to about 10 per cent. of the whole cultivated are, if it be assumed that one head of cattle provides manure for one twelfth of an acre, and that sheep and goats increase the amount to one-eighth.

11. Since the value of bullock-dung as a manure depends on the quality of the food given to the cattle, and the latter is in these provinces usually of poor character, consisting as it does merely of chopped straw, it follows that the value of the muck-heap manure is very much less than that of the same weight of farmyard muck in Europe. The chief exception to the rule is that in cotton-growing tracts much cotton seed is utilised as cattle food, and cotton seed is one of the most valuable manure producers which exists.

12. According to the usually accepted tenets of agriculture, the system under which cattle manure is utilised is extremely defective. The whole of the liquid manure is lost; the muck-heap is exposed, while being formed, to drenching rain, and is usually spread out on the land at the hottest season of the year (April and May) and lies sometimes for weeks under a baking sun and a scorching wind.

13. Stable dung, whether of cattle, horses, or goats and sheep, as well as house refuse, is sold by the sweepers of the premises of the richer clases, or by non-cultivating residents, such as weavers, oil-pressers, (who keep a bullock to turn their oil-mill), and others, to cultivating residents of a village. The price varies in the Doab from about two annas to four annas a cart-load of half a ton.

14. As a rule, human excreta are not systematically utilised as manure. It is not the custom to cover them with earth, as is practised in some other countries, and, apart from sanitary reasons, the non-use of a deodoriser is objectionable, since by exposure excreta lose much of their manuring value. The collection of village houses in one large mass entails much loss of manure, since either the fields immediately outside it, lying in everyone's path, are, if anything, over-manured, to the exclusion of those at a little distance, or else waste land (such as the side of a pond, the ravine near a river, &c.,) receives the greater part of what would otherwise be distributed in fields.

15. Although the systematic use of night soil mixed with earth or poudrette is the exception, yet in some

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exceptional cases it has not been neglected. The most notable instance of this is at the city of Farukhabad. The system pursued there is described by Mr. Buck in No. I. Vol. II., of the "Revenue Reporter" of the North-Western Provinces for 1873, (page 145). In large villages where nightsoil is removed from the houses of the richer inhabitants whose women do not leave the premises, it is sold by the sweepers, who remove it to cultivators at a small price.

16. The practice of herding cattle or sheep on land chiefly obtains in those parts of the provinces where there are extensive grazing lands, and cattle are largely kept in herds. In Bijnor, the drovers are paid to herd their cattle during the rains, on land, which in the spring is used for tobacco culture; and in all other parts of the provinces, where there are droves of cattle, people are glad to pay from two to four annas for the privilege of having 100 head herded on an acre for one night. This is a well known and very effective way of manuring land, since the soil gets liquid as well as solid excrements, and it is not uncommon to see places on which cattle have been herded white with the efflorescence of nitrates resulting from the combination of ammonia with the alkalies of the soil. Tobacco is largely grown on such land in some of the Sub-Himalayan tracts. In Bánda and Fatehpur sheep are grazed in large herds on the jungle land at the foot of the Central Indian table land, and are penned on fields for the purpose of manuring them. The same practice is followed throughout the province wherever there are herds of goat and sheep.

17. Liquid manure indirectly forms a most important factor in the manure supply of the province. It has been mentioned that no attempt is made by the cultivating population to secure for the land the liquid manure or urine of men or cattle. What occurs is this : cattle void their urine in yards or open spaces near the village where tethered; men do so in the fields close by, or as often as not on the side of the excavations of ponds always seen near habitations, and which generally owe their origin to the earth having been removed for building the mud walls of the houses. The liquid manure in dry weather mixes with the surface soil, and in the rains is washed, some of it into the ground, some of it into the village excavations. Much of the foul earth lying in the streets and gutters, and in which exposure to the sun and air has formed chemical compounds useful as fertilisers, is also washed to these ponds.

18. There are three ways in which the liquid manure washed into the ponds is eventually brought into contact with cultivated land as a fertiliser—

(1.) The foul water is baled on to any adjacent fields ;

(2.) The mud at the bottom of the ponds is broken up and carried on to cultivated land, or is used for building and repairing walls, from which the efflorescing nitrates are scraped by cultivators :

(3.) The foul water filtrates through the soil and impregnates the neighbouring wells with nitrates and other chemical compounds.

19. The first method is a simple, well known, and direct use of liquid manure, and needs no illustration. The second is less known, and has been little noticed. Mr. Buck states, in a note written in 1874, that the walls of all large villages are carefully scraped at their foot every year by cultivators (though sometimes saltpetre-makers anticipate them), and the earth used as manure for opium, tobacco, and other valuable crops. Similarly (and especially for opium), cultivators heap up and utilize the mud at the bottom of any pond sufficiently dry. Nitrates accumulate on a wall near its base, and the practice of scraping them out in itself necessitates more mud being brought up to plaster and repair the wall. The process is therefore enhanced in its action by the addition each year of earth freshly impregnated, and the mud walls assimilate on a small scale to the saltpetre heaps of France and Germany, which are artificially built up of earth impregnated with urine. The following is an analysis of such earth sent by Mr. Buck to Dr. Waldie, of Calcutta, for examination :

In 100 parts of earth dried at 220° Fah.

Constituents of Salt soluble in Water.	—	Constituents of Earthy Compound insoluble in Water, but soluble in Hydrochloric Acid.	—
Potassa - - -	2·21	Alumina and oxide of iron	7·10
Soda - - -	1·32	Magnesia - - -	·99
Lime - - - -	1·52	Lime - - -	2·66
Magnesia - - -	·27	Potassa - - -	1·00
Sulphuric acid (anhydrous)	·84	Sulphuric acid (anhydrous)	·07
Nitric acid (ditto) -	2·31	Phosphoric acid (ditto) -	·73
Chlorine - - -	1·59	Carbonic acid - -	3·04
		Silica acid - - -	·07
Total - -	10·06	Total - -	15·86

Silica and siliceous earth insoluble in hydrochloric acid.	70·29
Organic matter, including ·025 ammonia and a little water refined by ignition.	3·79
Total -	100·

The nitric acid is equivalent to nitrate of potassa -	4·32
The chlorine is equivalent to common salt -	2·62
The phosphoric acid is equivalent to phosphate of lime or bone earth.	1·60

This is a large proportion.

In the case of the salts soluble in water a portion of the bases is combined with organic acids ; these are included in the organic matter.

The earth as received consisted of earth dried at 220° Fah.	93·76	100·
Water refilled at that temperature -	6·24	6·65
Total -	100·	106·65

20. The third way in which liquid manure finds its way to cultivated land is by filtration to wells, of which the water is used for irrigation. Almost every village possesses one or more wells, of which the value of the water for crops such as tobacco and opium is known to be exceptional, while there must be a very much larger number of which the water is valuable, although not so exceptional as to be quoted as such. The following is an analysis of water from two wells made as before by Dr. Waldie :—

Analysis of two Samples of Water.

In 100,000 parts of water.

	First sample.	Second sample.
Potassa - - -	·46	·60
Soda - - - -	16·58	37·07
Lime - - - -	12·08	11·69
Magnesia - - - -	11·42	29·00
Peroxide of iron - - -	1·04	·64
Sulphuric acid (anhydrous) -	4·60	4·26
Nitric acid (ditto) - -	4·26	12·19
Chlorine - - -	19·53	51·83

Carbonic acid in excess.

Silica and organic matter not determined.

These constituents may be arranged as follows: according to the general practice of chemists combining the strongest acids with the strongest bases :—

	First sample.	Second sample.
Sulphate of potassa - -	·84	1·12
Sulphate of soda - -	7·49	7·27
Nitrate of soda - - -	6·70	19·18
Chloride of sodium (common salt)	20·49	51·26
Chloride of calcium (muriate of lime).	11·10	23·17
Chloride of magnesium (muriate of magnesia).		7·85
Carbonate of lime - - -	11·57	—
Carbonate of magnesia - -	23·98	53·97
	82·17	163·82
Carbonate of iron (omitted) -	1·51	·93
	83·68	164·75

The characteristics of these waters are the large quantities of nitrates, common salt, and magnesia salt.

These waters also contain a little ammonia, but in very small quantity:—

	Parts.
For the Kachi khera - -	·005
„ Parauli - -	·003

in 100,000. The ammonia has evidently been all oxidised and converted into nitric acid.

The common salt indicates the presence either of sea water or of animal matter, or possibly of both.

Of organic matter there seems to be very little; it has been all, or almost all, oxidised. It would be very difficult to estimate from the presence of nitrates. Of silica there is probably a little, but it was not determined. There was not a sufficient supply of water for the purpose, nor is it of much importance.

21. Manuring by refuse, leaves, &c. of previous crops is only practised on a large scale in the neighbourhood of indigo factories where the refuse stalks from the steeping vats are always collected and replaced on the lands adjoining. The value of fallen leaves of the cotton, arhar, and some other plants is known and generally appreciated by cultivators, but the leaves are sometimes removed and used as fuel. The fallen leaves of trees are carried off from roads and fields and waste lands by grain parchers, who sweep the country as clean as a ship's deck. The stalks of all the principal crops are used as fodder, fuel, or for roofing purposes, and only stray bits find their way to the muck-heap. Green manuring is unknown. Vegetable manure is therefore sadly deficient.

Rotation of Crops.

22. The system of rotation of crops ordinarily practised is one of great simplicity and efficacy; it consists in raising alternately one of the two crops, spring and autumn (or rabi and kharif), which can be grown in the year. The cultivator begins with a kharif or autumn crop of millet (joár or bajra); he ploughs the land through two or three times in June as soon as the rain begins to fall, sows his seed, and cuts his crop in October or November. He then ploughs up the land, but sows nothing in it during that winter, nor again during the next rains; but in the next October (after it has laid fallow for nearly a year) he sows wheat or barley. He reaps this crop in March or April, and the land is ready again for an autumn crop of millet in June. Thus, out of four possible crops, he has secured two in the two years, or one each year—one being an autumn and one a spring crop. If the land is rich and manured, the two crops will be cotton and wheat; if light and sandy, bajra or some lighter millet and barley. Unless there are some special circumstances affecting the land, all the outlying part of the village area, and about half the middle circle, comprising about 80 or 85 per cent. of the cultivated area, will be treated on this system.

23. The highly-manured inner circle, and the best part of the middle tract adjoining it, will not, however, be cultivated on this system, but will be made to produce two crops in each year. This is called do-fasli, or two-crop land. The autumn crop must not be a late-growing millet like joár, but one which will ripen early enough to allow of the land being ploughed and prepared for sowing the spring crop in October or November. The most usual examples of this rotation are maize or indigo, followed by wheat or barley.

24. These are the two common systems of rotation which are applied to the ordinary land of the province, according as it is, or is not, well manured. But there are also numerous special systems applicable to peculiar conditions of the soil. One of the commonest is in the case of low-lying flooded lands where the water clears off by November. Here a coarse early rice is grown in the rainy season, cut in September or October, and the land roughly ploughed up as it dries and gram or peas thrown in. This land is do-fasli, *i.e.*, it raises two crops in each year; but they are both poor crops, and it is very different from the rich do-fasli land round the village site. In Bundelcund the rich sticky black soil is hardly fit to raise any crops in the rains; it grows wheat or barley year after year, and gets either a fallow or (if the rains are light) a rain crop every fifth or sixth year to restore it. Some low lands, again, which are too damp to grow ordinary millets, but not sufficiently flooded to grow rice, can only be cropped with rabi or spring crops year after year. Light sandy soils, on the other hand, will often bear a moderate rain crop, while nothing would grow there in the dry weather; such soils may be sown with kharif crops (such as bajra) for two or three years together, and then left fallow; sometimes they are so poor that after only producing one rain crop they require to be left fallow for three or four years. It has already been mentioned (paragraph 5) that where canal-water is abundant, the two-crop system of indigo followed by wheat or barley is frequently practised, even on unmanured land.

25. It remains to mention certain special instances of rotation adapted to suit peculiar localities or crops. The principal case is that of sugar-cane, which being planted in February or March and cut in December or January, occupies the ground for nearly a year, and does not fit in with the ordinary autumn and spring harvests. The highest system of cultivating sugar-cane is that which allows the land a year's fallow beforehand; a wheat or barley crop is taken off in the spring; then the land is heavily manured and constantly ploughed till next February, when the cane is sown; after it is cut a light crop of maize or millet or rice is sown, and then wheat or barley, after which the year's fallow as before; in this way, in three years the cultivator gets three crops, a sugar-cane, an autumn, and a spring crop. But now that the pressure on the land is more stringent it is not usual to allow so long a time of rest. A common rotation is to sow first a kharif crop (generally one of the smaller millets, or oil seeds, or cotton, not the heavier jowar or bajra), then sugar-cane; after that, leaving the land to rest till October, a barley or wheat crop, then a kharif crop followed by gram or peas; thus five crops are got in four years. Another method of rotation is as follows: first year, maize followed by gram; second year, fallow; third year, sugar-cane; fourth year, a fodder crop (chari) followed by wheat; 5th year, cotton. This gives six crops in five years. It is obvious that there may be many variations in these combinations.

26. In the hill tracts fallows are more common than in the plains. In Dehra Dun it is usual to sow (1) cotton and arhar; (2) til (an oil seed) or mandwa (a millet); (3) wheat or barley; the fourth year being fallow. In Kumaon and Garhwal the same kind of rotation is practised, rice being laid down the first year instead of cotton and arhar. In the plains, in half-manured lands, a compromise is sometimes effected between the single-crop and the double-crop system; the cultivator raising three crops in two years, one in the autumn and two in the spring. The high cultivation of the market-gardening classes leads to endless variation. They generally get three and sometimes four crops out of the ground in a single year. A common method is to grow maize in the rains, following it at once with potatoes or carrots, after which in January are sown tobacco or spinach or a millet called chena. But it is unnecessary to go into minute detail in the case of crops which occupy so small a portion of the total cultivated area as these.

27. Drought frequently interferes with the ordinary system of rotation. When the kharif or rain-crop cannot be sown through the non-arrival of the summer monsoon, or when, having been sown, it withers through the premature failure of the monsoon, a large portion of the area prepared for this crop will, if the

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conditions are favourable, be placed under rabi or winter crop. In this case it is frequently the custom to lay down crops which will ripen early and produce a large quantity of food, such as carrots and potatoes, rather than the cereals which mature more slowly. And, generally speaking, if, through any cause, the kharif area is exceptionally small, it will be followed by a proportionately large rabi; and *vice versâ*.

Bengal.

Mr. Toynbee.

BENGAL.

The manuring and rotation of crops, as practised in Bengal, does not affect in the slightest degree the question of famine. These matters vary so widely in different districts and in different parts of the country; the use of manure is so uncommon—save for the most valuable of the non-food crops, such as indigo, sugar-cane, jute, &c.,—and the rotation of crops so seldom practised, and when practised is based upon such indefinite principles, that no precise report on the subject can be furnished. Cow-dung, which in England and other countries is given back to the soil as manure, is, in Bengal, used for fuel throughout the whole length and breadth of the land, except in forest and jungle tracts, on which cattle graze, where it is wasted. The only other available manures are—(1.) The products of each household dust-heap, comprising ashes, rice-water, vegetable refuse, &c. The amount of manure thus collected barely sufficies for one or two fields near the homestead on which some valuable garden or non-food crop is grown. (2.) For sugar-cane and other valuable and garden crops oil-cake is used. The use of bones and other animal manures is prevented by caste prejudice. As far as the great staple rice-crop of the province is concerned, all that seems necessary to secure a bumper-crop is timely and abundant rain. The use of European artificial manures is of course beyond the means of the people, even if their caste prejudices would allow it. A large portion of the Deltaic tract is well manured by the silt deposit of the annual floods of the Ganges and other large rivers.

Central Provinces.

Mr. Nickolls.

CENTRAL PROVINCES.

Generally speaking all land used for the cultivation of sugar-cane, opium, vegetables, and garden lands is irrigated and also manured. In Jubbulpore, and in the west of Bilaspur, some areas of sugar-cane are not irrigated, but are manured. To this is to be added the patches close to the houses and village site, in which maize, gourds, and the like are raised, also some rice, jowar, and wheat lands close to the villages. As nearly as I can estimate 6 per cent. of the total area of cultivation is probably manured in each year, and most of this is constantly manured. I cannot say what is the average weight of manure allowed.

Mr. Elliott in his Hoshangabad Report has not given details, and I cannot find mention of quantities in other settlement reports.

Hoshangabad.—The rabi and kharif lands are separated by a broadly defined mark, so that the simple system of alternating the two sets of crops which is current in Upper India is impossible here. The kharif crops are always sown on a system of rotation, but not the rabi. Year after year, for 30 or 40 years, the same field will be sown with wheat, and probably this is the only soil in the world which could bear such a strain on it, without manure, rotation or fallow. When the land begins to be exhausted gram will be sown on it, and then wheat again for a year or two, and then it will be let to lie fallow. Formerly when the uncultivated land was larger in extent, the practice of throwing a field into fallow and breaking up another in its stead was more common than it is now, but this practice is still pursued with second class sorts.

Narsinghpur.—It has been remarked that the unbroken succession of wheat crops, returned by the same land is often surprising; but sometimes the soil shows signs of complete exhaustion. In these cases gram or some other of its tribe is usually substituted for wheat for two or three years. Cultivators are afraid to leave their lands fallow even for a single year, for the vacant land is immediately occupied by rank khans grass, which no exertions can eradicate till it has run its appointed time, this is in the best soils 10 or 12 years, in poorer lands proportionately less. At the expiry of this time of forced rest the land is restored to the cultivator, refreshed and re-invigorated; but so much is the long fallow feared, that landlords will take up, even at a loss, lands unexpectedly thrown out of cultivation by their tenants.

Chhindwara and Betul.—The poor burdee soil is generally sown with the oil plant termed jugni, which will grow almost anywhere, and is said to improve the soil for any crop that may follow; hence it is often sown in exhausted soil by way of retrieving its quality. In the hilly parts of the district of course the kharif is the staple crop, but there are few villages in which there is not some land capable of raising either wheat or gram. The method of cultivation is the same as elsewhere, but from the fact of the cultivators being chiefly Gonds, and possessed of but little capital and few bullocks, the land is not generally so well prepared as it should be. It has, however, this advantage, that from the habit the Gonds have of frequently migrating, villages become deserted and the lands obtain the benefit of a fallow.

Sironcha.—In the Sironcha sub-division of Chanda joar and mung are grown together in the same field invariably. In this district the rotation crops are wheat and gram; til is generally sown in lands newly reclaimed from the jungle, but when not so mung is its rotation crop. Indian-corn is followed by joar or garden produce; sugar-cane where it is grown is followed in alternate years by rice. Both dry crop and irrigated lands when manured are seldom allowed to lie fallow if the cultivator can avoid it. When not manured, all lands are allowed to lie fallow once in four or five years.

Jubbulpore.—As regards fields not embanked, it has been said that the people neither irrigate and manure their lands, nor observe the common rules of agriculture in respect to the rotation of crops, but it is a mistake to suppose it is so. Of course irrigation is very little attended to, although there are many parts of the district where it would prove of the greatest advantage, and where water is easily procurable, as the sandy soils of Bilheri and Koombhee; but there are other parts again where the soil cracks for several feet below the surface in which irrigation would not be feasible, and if found to be feasible the expense of supplying it would so materially diminish profits that the old plan of depending on the fall of rain would be preferable. As regards manure the lands lying close to the huts or "*georara*" fields called "*kharee*" is plentiful, as wood fuel is more generally used than cow-dung cakes, and such lands always produce rich crops without requiring a fallow. In the Bijeragogarh sub-division irrigation is more extensively resorted to in the cultivation of potatoes, tobacco, chilies, ginger, &c., and in other parts of the district in the production of sugar and vegetables. In the former, manure from the village sites is conveyed to more distant fields by a drain cut towards the side the land slopes

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CENTRAL PROVINCES.

Mr. Nicholls.

called a "*nat*," and here it is the custom to rotate the crops by sowing wheat and gram in one year, and then joar or tili in the next, and so on; in other parts of the district by the substitution of some kharif crop or by alsee instead of wheat, gram, or massur.

Chanda.—The same land is grown with rice year after year without intermission or deterioration, and after the rice has been reaped the moist ground is often planted with mung, urd, or lakhari in the sandy soils, and with wheat, pulses, and linseed in the black soils, but this is only possible because the rice fields are yearly well manured. In some few places, where the tanks are large but sugar-cane not cultivated, a second or hot weather crop of rice, called *gimsal* is raised on the land from which the kharif rice has been cut. Sugar-cane is also grown on land just cropped with rice; but kala sata, which is the kind of cane usually cultivated, cannot be grown for more than one year on the same land. Kutuhee sata, however, may be raised in the same field for three years running. Save in soils irrigated, naturally or artificially, joar, wheat, cotton, pulses, and oil seeds are never grown two years continuously in the same field, but are alternated with one another No rule exists as to the order of the rotation, but it is found that jowari improves by following cotton, and suffers by following linseed. Hemp, especially the san kind, exhausts the soil greatly, and wherever possible a field which has borne it for one year is allowed to remain fallow for the second. Pán cultivation is still more impoverishing, and after each crop the land worked is invariably given a rest of at least 18 months.

Bilaspur.—Year after year rice is produced in the same fields without any change of crop or even an occasional fallow, and yet the yield is apparently uninfluenced. Where wheat is sown it will be followed by gram or massúr one year, and then perhaps by kodo, and where this is not done after four or five years the land is left fallow to recover itself. Again, cotton is often succeeded by tili or some other oil seeds, so that all through a regular rotation is adhered to, experience having taught the people that their soil is not rich enough, as in some of the Nerbudda districts, to yield steadily without a change of crop or a fallow, manure not being available as it is absorbed by the rice and sugar-cane fields.

Raipur.—The rotation of crops is, as might be supposed, utterly unknown; but as in Nagpur and Wardha, it is held that the proper crop to sow in newly broken up black soil is linseed. In Raipur this is generally followed by kodo, after which wheat or some more valuable crop is sown.

BERAR.

Mr. Dunlop.

BERAR.

The necessity of manuring is, I think, becoming more generally recognised; but so much manure is used as fuel in Berar that little of it is left for field purposes. Garden land is manured annually, dry crop land but seldom, indeed, in very many cases, not at all.

Until firewood can be more easily obtained, and is more generally used, the manuring of dry crop land will be neglected. An attempt was made in the vicinity of the Model Farm in the Akola District to get the people to use bones and poudrette* as manure, but the idea was not taken up.

Colonel Elphinstone in his Settlement Report on the Mehkar District, dated 1868, notices the following custom, which he observed in that part of the province:—

"That some of the intelligent cultivators are alive to the advantages of assisting the soil is evident from their sowing occasionally in land which is becoming impoverished, a crop of 'tag' or flax, which is allowed to reach a height of 2 or 3 feet, and is then ploughed into the land to form manure. But those I noticed doing so adopted the plan only in their sugar-cane plantations. They considered it too troublesome and expensive to be applied to dry crop land."

The same officer in his Settlement Report on the Pusad Taluka recorded the following observations:—

"The system of agriculture pursued by the natives is of the same primitive nature as that practised in other parts of Berar, but I have noticed here the very general use of that useful manure, the ashes of jowari stubble, and of cotton stalks, which I have not found so generally in use elsewhere."

Information is not obtainable regarding the quantity of manure generally applied per acre. I quote here Major Szczepanski's reply in regard to the Wun District. It cannot be considered applicable to the whole province:—

"Both rabi and kharif crops require manure every alternate year. Irrigated land alone is manured annually; one acre requires 10 cart loads, or 7,200 lbs. of manure."

Amraoti District, Lieut.-Col. Menzies.—Cultivation commences with sowing cotton, jowari, or gram, and these crops follow in succession. Kharif land is sown with either cotton or jowari for two years, and then wheat follows.

Ellichpur District, Major Mackenzie.—"Kharif crops, cotton and jowari alternately. Rabi crops, wheat and gram or ulsee.

Wun District, Major Szczepanski.—The custom in this district is that when new land is broken up it is sown with til (gingelly) the first year, cotton the second year, and jowari the third year. If the land is of superior quality, ulsee or some other rabi crop is sown in the fourth year. Otherwise cotton and jowari are sown alternately. Sometimes jowari with tur in one year, and cotton with ambadee (hemp) in the next.

In land of superior quality jowari, cotton, and rabi (wheat, alsee, or gram) are sown alternately. In heavy stony soils til (gingelly) and jowari are sown alternately. The land is not allowed to remain fallow.

The system of rotation prevails everywhere in respect to dry crop lands. The details of it vary in different districts as shown above, but, generally speaking, it is in light soil—one cotton, two jowari, three tur or some other autumn crop. And in good black soil suited for cold weather crops, one wheat, two gram or alsee, and an occasional crop of jowari or cotton.

It is to this system of rotation that the good preservation of land in Berar is in a great measure attributable.

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* Prepared in the jails.

BOMBAY.

Mr. Peile.

BOMBAY.

The collectors furnish the following reports:—

Kaira.—Statistics not available. The ordinary quantity of manure put down believed to be 8½ to 9 tons per acre. Sugar-cane requires 20 tons to the acre. There is no regular system of rotation of crops.

Broach.—Cotton is grown on the same land only once in three years. Jowari requires either a year's fallow or pulse in rotation.

Surat.—Only rice and garden crops are regularly manured. If any is left it is put on the jowari, cotton, or wheat land. Wheat is usually manured 5 cart-loads (2½ tons) to the bigha, rice gets 25 loads to the bigha, jowari, and cotton from 10 to 15 loads. Jowari and cotton are often sown in rotation, rice year after year in the same fields.

Colaba.—Little or nothing is done in the way of manuring. Rice patches are manured by burning on them dead leaves and grass before sowing. The land is cultivated for three years, and left fallow for three in turn.

Khandesh.—No portion of the land is constantly manured. Twenty cart-loads per acre is the usual rate for ordinary dry crops, and as much as 50 cart-loads for sugar-cane. There is a fairly uniform rotation of (1) cotton, (2) jowari or bájra, (3) rabi.

Nassick.—Only land devoted to sugar-cane and vegetables is manured as a rule. The ryot generally puts on all the manure he can get. Sugar-cane is grown once in four years. No other strict rotation observed.

Ahmednagar.—Manure is nowhere largely employed. When the rainfall is scanty manure is said to cause the crops to wither. There is no rotation except the interchange of wheat and gram. Manure is used only for garden crops and sugar-cane.

Poona.—Irrigated crops generally, especially sugar-cane, vegetables, &c. are manured yearly. Sugar-cane requires 100 cart-loads per acre and potato crops 25 loads. There is no fallow in rice or garden lands. In dry crop lands, where wheat and nagli are cultivated, three years fallow after three years cultivation. No rotation is practised as a rule.

Sholapur.—Manure is little used for dry crops. There is no rotation, but if possible a kharif and rabi crop is alternated.

Kaladgi.—All irrigated land, except rice land, is yearly manured. Dry crop land sown with kharif is also manured, red soil yearly, and the rest once in three years if possible. Probably one-eighth of the kharif land is manured yearly. The weight of manure varies with the quality of the land, from 600 maunds per acre on poor lands in the north to 200 or 300 maunds on richer land in the south. There is no regular rotation of crops, except that land sown with cotton one year is sown with jowari, wheat, or gram the next.

Canara.—As much manure is put on as can be got. For an acre 40 head-loads of 84 lbs. of cowdung, leaves, &c. is considered proper. There is no customary rotation of grain crops. Sugar-cane is only sown once in three years.

Thana.—Garden and vegetable crops are manured. Rice and nagli are manured with ashes in the nurseries before transplantation. Rice is grown year after year on the same land without fallow. Nagli requires one year's fallow.

Satara.—The best garden land producing sugar-cane, turmeric, betel leaves, vegetables, and fruits is constantly manured. The weight of manure per acre is 4,000 lbs. For ordinary garden land 1,600 lbs. suffice. Dry crop lands are generally manured every fourth year with 1,000 lbs. of manure. When both kharif and rabi crops are grown they are grown in rotation; when kharif only there is no fixed principle. In kumri cultivation the ground is allowed to lie fallow six, seven, and even 12 years.

Ratnagari.—All the rice lands and about half the warkas lands are heavily manured every year, but the weight of manure cannot be stated. It may be said that, harik excepted, all the crops require manure, and will not mature without it. The manure consists, on rice lands and on warkas, so far as the manure will go, (1) of dried cowdung crumbled over the surface, (2) of a layer of grass, leaves, and boughs of brushwood (called ráb), which is burnt at the end of the hot season, and then ploughed in all lands except the worst hill or warkas land.

Mr. Robertson, Commissioner, Central Division.—As a rule, no land far from the village is manured. Only irrigated lands are manured. The further a field is from the village the less chance of its ever receiving any manure. There is no fixed quantity per acre. A cultivator collects all the ashes, refuse, and dung he can, and his land just gets what he has collected. It is only the well-to-do cultivator who purchases any manure. There is so little firewood available that all the cowdung is made up into cakes and used as fuel. The system of fallow does not exist.

Colonel *W. C. Anderson.*—I cannot say what proportion of the cultivated soil is manured yearly, this varies in different localities according to the nature of the soil. As a general rule, in the centre and south of the Bombay Presidency all irrigated land is manured, and if after manuring the irrigated land any manure is still available it is applied to the dry crop land, commonly to red gravelly and sandy soils, and less often to black cotton soil. The use of manure is only limited by the supply. The quantity of manure varies with the nature of the crop. As much as 40 two-bullock cart-loads is commonly applied for sugar-cane and 10 cart-loads for rice to the acre. Dry crop land would never get more than 10 cart-loads. A cart may possibly carry 4 or 5 cwt. at most, as manure is loose and bulky in proportion to weight.

A rotation of crops is generally adopted. Sugar-cane is grown on the same land once in three or four years, and rice in the other years in rice districts, followed as a second crop by wheat, gram, or some kind of pulse. In the South Maralta Country cotton is grown one year in three, and jowari and wheat in the other years, with oil seeds intermixed in rows. It is not the custom to leave land fallow except in the very moist country near the Ghats, where fallows of one or even up to two years in three are allowed, unless manure is available.

Guzerat.—The white soils are, to the extent to which manure is procurable, pretty constantly manured. The lands irrigated from wells, growing sugar, tobacco, and other valuable crops, get yearly as much as 30 loads, or 15 tons, the acre. The dry-crop lands, especially those at a distance from the village, get only what manure can be spared. Perhaps a good cultivator will give such a field growing bajra, toor, &c., 10 loads a year per acre, or 20 loads every second or third year.

The black soils are supposed to need manuring less than the white. Generally, the fields near the village are constantly and freely manured; those at a distance get little, but are often (though not now so generally as formerly) fallowed in lieu of manuring.

As regards rotation of crops and fallows, the system varies so much in different localities that it is not easy to give an account of it within reasonable limits. Speaking generally, the people do not think it well to grow the same crop two years running; though I know places (especially in the deep black soils of Surat) where jowar has been grown year after year with little manure or fallow for, the people say, generations. In the white soils the crops are mostly kharif or early bajra (the ordinary food grain), pulses, toor, mung, and the like, and oils, tilli, safflower, &c.; and the common rotation is bajra, pulse, and another crop in three years. In the black soils the crops are more commonly "rabi"—wheat, jowar, and cotton (which is considered "kharif" because sown early, though it is harvested late); and the usual rotation is of two years—cotton and wheat or jowar; or of three years jowar, cotton, and wheat. In irrigated lands sugar is generally grown once in three years; with wheat or barley, pepper or vegetables, in the intervening two years. Tobacco, where manure is abundant, is often grown continuously for two or three years; and then a dry crop.

In Broach the rotation of fallows used to be very regular, and the villages were divided into "khanam" or "bhadool," according as the fallow was given once in five or once in four years. But I believe that of

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OMBAY.

. Pedder.

late years, since land and its produce has become so much more valuable, a regular system of fallowing has been almost entirely discontinued. A field is only fallowed occasionally, when it shows signs of great exhaustion and the owner cannot manure it.

Khandesh is a very large province, and there are great differences in the system of cultivation in various parts of it. In the black soils, cotton, wheat, and jowar are the chief staples, and the rotation is of two or three years accordingly. On the uplands the crops are mostly kharif, and the bajri, túr, &c. are grown in no particular rotation, bajri being mostly grown every other year. Manure is by no means plentiful in Khandesh. Usually, the fields watered from wells, and those near the villages are well manured: while the outlying dry-crop lands get little manure, and only an occasional fallow.

In the black soils of Nasik, wheat and jowar are the chief staples, and are commonly grown alternately.

In the lands irrigated from rivers in the western parts of Khandesh and Nasik there is a very regular system of rotation, usually either of three years—rice, sugar, wheat; or of four—rice, sugar, wheat, and a dry crop. The land is very heavily manured, with 30 or 40 loads to the acre, in the year in which the sugar is planted. In villages having river-irrigated lands almost all manure is given to that land, and the dry-crop lands get little manure, and are carelessly cultivated.

The system of cultivation in the Konkan is quite a different one. The lowlands grow rice almost exclusively, with occasionally a second crop of some pulse; the uplands, the common food-grains—nagli, harik, &c. There is no system of rotation. The same land always grows rice or whatever the crop is, and the rice lands are never fallowed. But the uplands are generally fallowed occasionally; and with some of the worst hill-lands a fallow of three or four years follows one or two years cropping. All these crops are transplanted, and are manured on the system known as rab. The spot selected for sowing—generally about one-eighth of the area of the field—is, about March, plastered over thickly with the dung of animals, then covered with leaves and rubbish and twigs or branches above, and a layer of finely-screened earth above all. The whole is then set fire to, and allowed to smoulder away, leaving a thick ash, which is lightly ploughed in at the beginning of the rains, and the seed sown. Next year another spot is selected for sowing; and thus all the land gets thoroughly manured once in 8 or 10 years.

SINDH.

INDH.

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Land devoted to such crops as sugar-cane, tobacco, hemp, vegetables, &c. is manured yearly and heavily, about 20 to 25 tons to the acre. In the case of wheat manuring is usually confined to a top-dressing. Land cultivated with the common cereals, joari, &c., and in the vicinity of villages or hamlets, is generally manured, but not heavily, perhaps about 10 tons to the acre. The proportion of manured to unmanured land is exceedingly small. I hesitate to estimate what it may be.

In kharif lands fallows are ordinarily given in the proportion of two years to one of cultivation; but when land is of poor quality three and even four years fallows are thought necessary. A rotation of crops is customary in lands of the class described in the beginning of the preceding paragraph. In other lands there is sometimes a rotation of rice and joari, of joari and wheat, &c.

MADRAS.

DRAS.

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venue.

The very great diversity of practice in the different districts, and the uncertainty as to the value of the information supplied in many cases, renders it difficult to answer this question categorically. Two statements have been compiled—one, in the appendix, from the replies received in 1865 to proceedings of the Board calling for reports on the system of agriculture prevailing throughout the Presidency, the other, which is given as an annexure, is an attempt to tabulate the information now received with special reference to the question under reply. As usual the collectors' replies are given in full in the appendix, and a few quotations will be made here. Writing of Chingleput, Mr. Price says: “Nearly the whole of the area of cultivable ground is manured every year. The exception is principally in the case of virgin soil and that which has lain fallow, and then it is only dry land which is thus treated. Wet land is invariably manured; under the Red Hills Tank, where manure is brought from Madras and where there is more farming than elsewhere, the proportion, as I ascertained when there some time ago, is about one ton of strong manure per acre and half to three-fourths of a ton of leaves and weeds. The manure is ploughed in and the green stuff put on afterwards and trodden in. Where the manure is inferior, about 1½ to 2 tons per acre appears to be the allowance accompanied by the same quantity of leaves as mentioned above. In dry lands the quantity of manure is less than on wet, and from what I can make out is not much more than half a ton per acre. * * * * * * * *.

“Another mode of manuring, which is very much in vogue for *ragi* and other dry crops, is to put a flock of sheep or goats on it for five or six nights and then manure lightly.”

The Board attach great importance to this reply as the result of inquiries personally made by an officer who has no theory to support, and yet does not accept without scrutiny any assertion which a ryot may choose to make on a subject with regard to which it is by no means easy to extract definite information. Chingleput is a poor district, but its vicinity to the town of Madras affords exceptional facilities for the purchase of manure and a ready market for produce. Turning to Tanjore, a rich district, the Board find it stated by Mr. Webster: “Very nearly the whole of the cultivated area of this district is manured year by year or once in two or three years. Two and a half tons per acre is the quantity used on lands manured annually, and about double that amount for lands manured every two or three years.” It is to be noted, however, that the alleged universality of the practice of manuring is not borne out by the report submitted in 1865.

From Bellary Mr. Gordon reports; “About one-sixth of the cultivated area is annually manured, *i.e.*, well cultivation and garden land invariably, other wet cultivation almost invariably, and the dry lands close to the villages.

“For well cultivation cow-dung refuse and leaves are used at the rate of up to 225 cwts. per acre for each crop.

“For wet cultivation other than that under wells about 45 cwts. of leaves and rubbish for each crop is the average. The best manure, however, is sheep droppings procured by folding sheep or four of five days or more on the land. The weight of manure per acre is difficult to estimate. One thousand sheep folded for three nights on one acre would manure it amply."

The Sub-Collector of Madura, Mr. Martin, writes: "Wet crops are manured annually over almost the whole cultivable area at the rate of 3 to 5 tons per acre. The per-centage of dry land manured has not been satisfactorily ascertained, and the manuring consists in the majority of cases in nothing but the tethering of the village herd for a very short time on the land. The constantly-manured lands are principally those so manured, and the weight allowed is about half a ton an acre."

The extent to which manuring is carried on in the Coimbatore District is fully discussed in paragraphs 151 to 167 of the Annual Report of the Superintendent of Government Farms for the year 1875–76, and the conclusion Mr. Robertson comes to is that 75 per cent. at the least of the occupied land is never influenced by manure, and that part of the remainder is manured in an unsatisfactory way.

Regarding the Salem District, Mr. Puckle wrote in 1865, in submitting the preliminary settlement report: "Manuring is a serious expense in Salem, and the usual method of applying it is to tread in leaves on wet land and to pen out sheep on dry. The fields are manured to the full extent of the ryot's means. I have lately passed through villages where the irrigated lands were being prepared for planting, and have noticed the immense quantities of vegetable manure applied. One hundred and twenty bundles of wild indigo or other leaves is about the average per acre, and this quantity is annually trodden into all fields thought worth manuring * * * * * * * *. The dry lands are manured by sheep wherever practicable."

It will be observed that in this last extract there are three qualifications. The manuring is limited by the ryot's means, and by his opinion as to a field's being worth manuring, and dry land is only manured by sheep wherever practicable. The Board consider that these qualifications are generally applicable and must be fully allowed for when considering such of the replies in the appendix as testify to a more liberal use of manure than is reported in the extracts above given.

Speaking of the presidency generally, the Board would say that the common practice seems to be to manure seed beds and garden or well crops liberally, to give such paddy lands as are not amply manured by river silt from 1 to 3 tons of cattle or sheep-dung, village ashes, and leaves, the leaves preponderating in most districts, and to pen sheep on unirrigated land to the utmost extent compatible with the number of sheep available for the purpose. Attention not having hitherto been specially directed to the point, the Board cannot rely on the quinquennial returns of the number of sheep and goats in the different districts, and they are therefore of opinion that any calculation of the extent of dry land manuring based on these returns would only be misleading. There seems, however, to be reason to believe that much of the unirrigated land of the presidency receives little or no manure, and in many districts there is still such an abundance of waste land available that the ryots find it more profitable to relinquish exhausted land and take up either virgin soil or fields which have received several years of rest. Besides these relinquishments of inferior land, which has no market value, about 2,000,000 acres of the unirrigated land held on putta is annually left uncultivated, though the assessment continues to be paid thereon.

The above general statement of what may be considered to be common to districts in which much diversity of practice prevails must not be supposed to represent the maximum extent to which manuring is carried on under the most favourable circumstances. Facilities for manuring vary in different districts and in different parts of the same district, and one ryot has more energy or more knowledge than another. The manure directly applied to irrigated land is supplemented by the silt deposited by the water used in irrigation. Indigo vat refuse is used where the manufacture of indigo is carried on; sweepings and rubbish form a larger proportion of the manure used in the neighbourhood of towns than they do elsewhere; and vegetable manure generally is much more abundantly used on the West Coast than in the more arid central districts. Silt from tank and river beds is a favourite manure in some localities, and the use of oil-cake refuse is tolerably widespread. The ryots of Canara thoroughly appreciate the value of the urine as well as the dung of their somewhat scanty stock of cattle, and even the use of night-soil and green-manuring would seem to be not altogether unknown.

On the other hand, there can be no doubt that, besides the limitation of manuring by the ryot's want of means, there are many cases in which the most is not made of valuable manures close at hand. The lamentable waste of cattle dung as fuel is probably owing to pressing financial considerations coupled with a conservative clinging to the large consumption of fuel for domestic purposes which obtained when jungle was more abundant and fire-wood cheaper, but ignorance, prejudice, and apathy are apparent both in the general failure to make use of cattle urine, human excreta, &c., which are ready to hand, and in the absence of any widespread attempt to introduce new manures or increase the quantity now available.

It seems to be generally recognised that a special exhaustive crop like sugar-cane cannot be grown continuously on the same land, but it may be said generally that there is no rotation of crops practiced in the sense of alternating exhaustive and restorative crops. In the Godavari District, however, it is not an uncommon practice to grow hemp on irrigated land to be fed off by cattle. Different kinds of cereals often take the place of each other, and a pulse frequently follows a cereal, but it is more the convenience of the cultivator than the capabilities of the soil that seems to be considered.

The only system of fallows which prevails is the practice alluded to above of relinquishing land or leaving it waste for a term.

A Description of the Agricultural Practice in the several districts of the Madras Presidency in regard to the system of rotation of crops, fallows, and manuring lands.*

Description of the system of Fallows, rotation of Crops, and Manuring.

Vizagapatam.—With the exception of sugar-cane, which is never grown on the same land for two years running, the practice of rotation of crops is not followed in this district. The ryot does not appreciate the theory that crops of the same kind on the same land every year have an exhaustive effect, and that the remedy lies in a system of rotation of crops. Lands are occasionally left fallow, but never for more than one year. When so left fallow it is generally devoted to pasturage for ploughing cattle. The fertility of the soil is maintained by manuring and ploughing. The manures are chiefly cowdung, wood ashes, refuse of indigo vats, and oil mills, but the most effectual manures are the droppings of sheep and goats, which are secured by penning the flocks at night on the land requiring to be manured. For this the shepherds charge from eight annas to a rupee a day, according to the number of the flock. A fortnight or so before the cultivation season of each description of crop comes round, manuring generally

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* Compiled from replies of Collectors received with reference to Board's proceedings, dated 27th June 1865, No. 3,553.

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takes place; for paddy lands little or nothing is used, but for the paddy seed beds, and for other cereals, all the above-mentioned manures are more or less used.

Kistna.—A piece of land is occupied as a betel garden for three years, and is then abandoned for another.

Except as mentioned above, lands are not left fallow with the object of giving them rest. They are manured by leaving cattle upon them, and if after being manured in this manner for years they become unprofitable, they are generally abandoned or allowed to lie waste for four or five years.

Wet lands irrigated by the Kistna, as a rule, do not require manure, owing to the immense amount of fertilizing deposit in the water.

Nellore.—The principles of rotation are best understood and most carefully practised in the north, where the south-west monsoon gives more months than the other ryots have for the cultivation of the land, and there varigu is rotated with the other crops, which again are themselves rotated, elsewhere paira jonna is the crop rotated.

In some of the rich Regada lands rotation and manuring are enough to secure good crops without much fallowing. On the red soils, fallows are common. But it would be difficult to assign any fixed periods for fallows. And in fact in the inland taluks, where these red soils chiefly occur, their cultivation can scarcely be called cultivation in the usual acceptation of the term. It is more a speculation for the cattle.

As regards manuring. In the haphazard cultivation of the red soils, as might be imagined, manure is unknown. The whole of the manure that can be scraped together is there put in the gardens. In the north, the varigu fields are manured and ploughed as carefully as in England, and elsewhere all the manure goes to the rice, the manure used in every instance being everything that the ryots can lay their hands on for the purpose, and often cattle are penned on the land.

Cuddapah.—As regards rotation of crops, there is no established system amongst the cultivating classes. But the principle of not straining the resources of the soil injuriously far is fully understood, and a crop requiring little nourishment always succeeds an exhausting crop, thus ragi will be sown after sugar-cane, cotton, and indigo.

Dry lands are allowed to be fallow, sometimes for long periods. Ryots will take land, cultivate and exhaust it in two or three years, and then throw it up for five or six. The lands they retain they will sometimes allow to lie fallow for a year after cotton, and they always give it a year's rest after two or three crops of cholum have been harvested from it. They never suffer wet land to lie fallow.

Manuring is well understood in this district. Every ryot keeps a heap of farmyard manure near his house, and he pollards all the trees in his holding for the leaves and branches. The leaf manure he uses for wet lands, laying it down in considerable quantities after the land is ploughed. The leaves are quite fresh and recently cut. They ferment and decay in the soil. The ryots even buy leaves for manure. They are generally leaves of neem and trees other than fruit-bearing trees. The ryots also use extensively the refuse of the indigo vats for manure. The farmyard manure is applied to dry soils and to garden lands. It is stored carefully and bratties for fuel are not so exclusively used in this as in other districts

The system of heavy manuring is no doubt found to pay. In the immediate vicinity of the town of Cuddapah two-crop paddy land of an ordinary quality is looked upon as yielding a clear profit of from 100 to 150 Rs. a year, and cholum cultivation on black soil is not much less remunerative. Indigo cultivated on red soil will give a clear 100 Rs. an acre. The profits on cotton vary with the prices, but they have been good.

Bellary.—The productive powers of wet lands for the above-mentioned crops is maintained by manuring them with the contents of dung hills, in which are amassed* house sweepings, cowdung, ashes, and other refuse, by ploughing into the ground leaves and branches of different kinds of trees, especially of those noted below,† as also of anumulu, a kind of bean (*Dolichos lablab*) which is purposely grown in the land intended for paddy, and after the former is reaped, the stump creepers and the remains are forced in by a plough and then moistened to fertilize the soil, and lastly flocks of sheep are folded at night on the land for four or five nights.

There is no system of rotation with paddy observed. The early or kartika crop is followed by the second or vaisaku cultivation year after year. On sugar-cane lands, however, crops of rice and sugar-cane are raised in rotation or alternately every second year.

As regards the crops noted below‡ raised on the very best sort of regur land, the only approximation to a system of rotation is as follows:—

First year.—Cotton and korralu are sown together, one row of cotton to two or three of korralu, or sometimes the former alone, or white cholum, and sometimes mixed with Bengal gram in the proportion of five rows of the former to one of the latter.

Second year.—White cholum alone or mixed with Bengal gram.

Third year.—White cholum or wheat.

As a general rule, cotton is sown only once in three years on the same land, as it is alleged that this crop greatly exhausts the productive qualities of the soil and engenders much heat whereby the land is disqualified from producing in succession any good crop.

Similarly for crops grown on other lands.

Kurnool.—There is no regular rotation of crops practised anywhere in the district. Jonna, the great staple, is grown year after year on the same fields occasionally replaced by cotton and other grains according to the convenience of the farmer, though not with the idea of any benefit arising from such change of crop.

The extent of each particular crop grown in any season, leaving out of consideration any extraordinary inducement on account of increase in price, depends almost entirely on the date of the rainfall. If the monsoon breaks early, sadza, yellow jonna, korra, and araga will be largely cultivated. If the rains are late more horse gram, cotton, and white jonna, which are sown in August and September, will be put down, and if there is a general fall of rain late in October there will be an unusual growth of wheat and Bengal gram, with other insignificant grains that can be grown rapidly and reaped within three months.

With regard to fallow, the better soils of the district are cropped year after year in perpetuity; but this is of course impossible with the poorer soils, and the lower classes of the red ferruginous series do not bear crops for more than three years in succession. They are then thrown out of cultivation for three or four years, after which they are again brought under the plough.

Except in special localities land of this description is not worth retaining by the owner during the years of fallow. It is thrown up when exhausted and again taken up, often by the same party, when supposed to have become once more fit for cultivation.

With regard to the use of manure, the application is universal in the case of all irrigated lands.

Paddy lands are manured with animal refuse, but more generally with the branches and leaves of trees. Garden lands are invariably cultivated most highly, the sweepings of the villages and cattle manure being used. Flocks of sheep are also penned over the fields for the purpose of manuring them. The richer dry fields, when situated near the village, are treated in the same manner as the garden lands. It may be said truly that no agriculturists in the world are more alive to the value of manure than those of India, and with regard to their high garden cultivation there is little which under their peculiar circumstances they have to learn from European science.

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* Fifteen to twenty-five bandy loads of manure for an acre.

† Jilladu or Asclepias Gigantea, or Tangadu or the Cassia Auriculata, Kaniga or Galedupa Arborea, wild indigo.

‡ Cotton, korralu, Bengal gram, white cholum, wheat.

In the taluks of Cumbum and Markapur, which are situated to the east of Nallamalai Hills, and depend chiefly on the N.E. monsoon, the system is different. Here dry cultivation is of little importance and the ryots are chiefly engaged in wet and garden cultivation. The soils are poorer and jonna is little grown. The poorer soil in these taluks are never cultivated for more than three successive seasons, they are then abandoned, and possibly taken up again after a lapse of four years. But the supply of this kind of land is so limited that no ryot thinks of retaining fallow land in his puttah. In the dry cultivation of these taluks manure is never applied.

Wet and garden lands are however highly cultivated under the Cumbum tank which is well supplied by stream from the Nallamalai Hills; sugar-cane and double crops of paddy are grown every year. The natural poor soil of this valley has been enriched by high cultivation and its fertility is probably not to be surpassed in India; every field is heavily manured for every crop; that chiefly used being leaves and branches brought often from a distance of 20 miles.

The other scattered portions of irrigated land in these taluks are more generally enriched with cattle manure. Each ryot devotes his whole available supply to his plot of garden ground, and the large flocks of sheep and goats in that part of the country are always folded in their fields during the hot weather, and after each crop is cut—a practice to which the shepherds look as one of their most certain means of remuneration. They are generally paid for the use of their flocks by a portion of the produce.

South Arcot.—Land cultivated with varagu in dry is left fallow the following year; also wet lands cultivated with sugar-cane are similarly treated. As a rule the only fallows in dry grain lands are after varagu; the fields thus cultivated are allowed one year's rest, and as these lands are usually cultivated with varagu they are fallow every alternate year. With manuring and rotation of crops these lands might doubtless be made available year after year, but the system has never been introduced. After sugar-cane, wet lands are always allowed a year's fallow.

As regards Nunja land, twigs and leaves of trees and shrubs, refuse of indigo and ground-nut are used as manure; the stubble is also ploughed in. For dry lands cowdung and sheepdung, as well as the sweepings of the houses and backyards are employed; but the practice most usually adopted is penning sheep in various portions of the field to be manured. In the southern portions of the district the Coleroon brings down such a rich alluvial deposit that this fertilizing ingredient, termed "vandall," acts in lieu of manure, and makes the lands under Coleroon irrigation most rich and productive.

Tanjore.—The practice of cultivating crops by rotation is not known as regards wet cultivation in Tanjore, the same crop being always cultivated on the same lands. In the case of dry grains, ragi and varagu are the only crops which, as a general rule, are cultivated alternately with other crops, in consequence of their being considered to exhaust the fertility of the soil. Other dry grains are also changed from year to year; but this is more by choice than as a measure intended to prevent the fertility of the soil being impaired. The practice of leaving lands fallow is observed to a limited extent in the Kadarambham or dry tract of the Tanjore Taluk, but this is only in the case of lands cultivated with varagu. This, moreover, is not regulated by any fixed rule, the land being left fallow sometimes every second year and sometimes once in two or three years.

It is the inferior soils which require any considerable amount of manuring. Of the superior soils "iruman" and "karisal" require it in a far less degree, and the red alluvial soil requires little or no manure.

The manure generally used is the excrement of cattle and sheep. For this purpose herds of cattle and flocks of sheep are sometimes made to stand on the fields during the night time before the ploughing season; but when this is not practicable the mode generally adopted is to preserve the dung in heaps along with ashes and the sweepings of houses, and to spread it over the soil. The sandy and brackish soils are manured also with the leaves of plants both dry and green, as well as with the silt in dried up tanks and low pits, which is scraped out and spread over the fields.

Madura.—As to manuring (dry land as well as wet or garden), oxen or sheep, or both in large numbers are hired (from people who purposely keep up such, and itinerate through the country in quest of pasturage and employment for their herds) and herded in the fields at night, and the dung and urine, the cattle drop is excellent manure. Also, dung wherever found, is collected and taken to the field, as are ashes, rubbish, and chaff of paddy. In regard to Nunjah lands it is further usual to throw bundles of kolunjee, avarai, erukolai, &c., leaves in the fields, and plough them down in the mire to make them rot. For some years past the refuse materials used in tanning sheep skins, consisting of avarai bark, lime, &c., are also made use of as manure in the vicinity of towns. Rarely alluvial deposits in beds of the tanks, channels, and ponds are used for the purpose. Excrement of bats, which are found in old ruined or unfrequented places, is excellent manure, and is made use of in wet nurseries. To remove brackishness of soil, milkhedge, varagu straw, horses' or asses' dung are used. Sierumangan and some other kinds of paddy are sown in lands so treated, and are believed to neutralize brackishness.

Tinnevelly.—In rice-growing lands nothing that can properly be called rotation is practised. The ryots are, however, in the habit of sowing an inferior kind of grain in April, while the best kind is grown in October. There are two kinds sown in April, one called annackumben, a small grain, and the other codaikulatham, a grain of a somewhat darker colour. As regards cotton, no rotation is practised. Betel crop will last for three years, after which time it becomes coarse and old, and the ground is incapable of producing another crop. Paddy is grown for four seasons, after which betel may be again planted.

Two plantain crops in succession cannot be planted on the same land. The next year after the plantains have been gathered some other Nunjah or Punjah crop will be sown, but it does not seem there is any rule as to what kind of crop.

If cumboo crop is grown on a rich soil, such as black cotton, no rotation is practised. If dry grain is grown on red soil, is varied with some other dry crop, but not apparently with regard to any systematic rule. The same practice is followed with regard to cholum and varagu, but the practice appears to depend on the scarcity of some other dry grain crop and its consequently enhanced price rather than on any idea that the soil is benefited by a change of crops.

Land left fallow.—Wet land is never left fallow when there is a supply of water. With regard to dry land, it seems to depend on the quality of the soil, whether the land is left waste occasionally or not. Good rich soil is always cultivated, while poor soils are, as a rule, left uncultivated once every three years. This remark, however, does not apply to lands irrigated by artificial means, such as wells, &c.

Manure.—In the Tinnevelly District, manure, when it can be procured in sufficient quantity, is used for all crops, and the people seem fully alive to the importance of this measure. The manure generally used is the dung of cattle, and the refuse of towns, villages, &c., mixed with ashes. A very common practice is to fold sheep in a field before it is sown, and plough in their dung afterwards. In rice cultiva-

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tion a somewhat curious method is followed. For the second crop, at the time of transplanting the young paddy, bundles made of the branches and leaves of a small shrub called "avarankulay" are thrown into the field and left to rot. This is supposed to impart a superior quality to the paddy. For betel cultivation no ashes are used, the dung of sheep is generally dug in.

Coimbatore and Nilgiris.—In the superior descriptions of dry land situated south of the Noyel River, cholum is generally sown as a first crop in April and is followed as a second crop, and in the interior lands horse gram is grown as a second crop. In dry lands situated in other parts of the district gingelly seed is sown in March and is followed by a second crop of horse gram or cumbu. In a great portion of the garden lands cholum is first sown, and is succeeded by a crop of ragi, chillies, wheat, or tobacco, according to the quality of the soil and the convenience of the ryot. In other localities the garden lands yield three crops in the following order—1, cholum, 2, ragi, 3, tobacco. In some of the two-crop paddy lands the first crop is followed by a crop of sugar-cane, which takes 12 months to come to maturity.

The inferior dry lands on being exhausted are allowed to lie fallow for periods ranging from three to five years. They are not, as a rule, manured, except on the Neilgheries and Colegal taluks. On the Neilgherries the manuring of the land is limited to those fields in the vicinity of the villages on which valuable crops, such as wheat and garlic, are grown. On the garden lands considerable care is bestowed in manuring them, manure is carted or otherwise carried from a distance, and cattle and sheep are folded on them. The shepherds fold their sheep on a ryot's land at so much per head per month. The wet lands are improved by the supply of vegetable manure, in the shape of bushes, which are cut down, spread over the land, and immersed in water until they decompose. The bushes chiefly used are the "Tephrosia* purpurea" and "Calotropis† gigantea;" women collect the bushes and sell them at so much per head-load; like everything else, the price of these bushes has increased of late.

12. *South Canara.*—*Manuring.*—The importance of manuring the land is well known in Canara, and manuring is universally practised. For every cubit of land, it is stated that a basket of cowdung is necessary, and to this is added dry and green leaves, ashes, &c. In fact, manure is considered of so much importance in the labours of the field that the well-being of the cattle is often sacrificed to the obtaining the largest quantity possible.

Rotation of Crops.—The rotation of crops, as a rule, may be said to be unknown. Sugar-cane, which is an exhausting crop, is not, however, grown for many years in the same place; where water for the second or third crop is not available, dry grains are planted. In some lands in the neighbourhood of the ghauts, the second crop of rice is raised only every second year; in the intervening years oil seeds are raised.

Fallows.—Fallows also may be said to be unknown, and, as a rule, where land can be cultivated, it is never allowed to lie waste. In the kumeri cultivation on the face of the ghauts a crop is only sown once in a series of several years, and is not cultivated a second time till the jungle is again grown, and admits of being burnt.

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* Colinjee. † Yereockam.

MYSORE.

Mysore.

Mr. Ricketts.

The soil of the district is on the whole of an inferior description, and requires constant manuring. The lands about Bangalore are highly manured. There is less rotation of crops than I believe in many other parts of India. Fields have been pointed out to me where the same crop, ragi, which is the staple food of the country, has been grown for years running. This can only be done by good manuring, and when manure fails then a rotation crop is put in. In the present year in particular a larger area than is usual has been sown with ground-nut (*Arachis Hypogœa*) because the land was not sufficiently manured, and next year too the same land will get on well without manure, even though sown with raggy, because the leaves of the ground-nut form a good manure in addition to the benefit of pulverization of the soil by the thorough digging up of the soil in order to get the nuts. On the whole, when much manure is available ragi will be sown on the same field for a number of successive years, and when manure is wanting, or the ragi crop fails from capricious rain, then an inferior crop, chiefly horse-gram, is put in. In poor soils the staple crop is usually horse-gram. I may state here as a curious fact that the ryots of this district neglect manuring their wet in favour of their dry lands, and I am inclined to believe that this preference had its origin in the objectionable system of batai or half-share by Government in the produce, whereby, if the ryot manured the wet land half of the benefit thereby went to the Government.

Mr. Harman.

The proportion of land manured depends on the supply of manure, and may roughly be stated at ¼ of the cultivated land of dry land and ½ of the wet.

Ragi is the crop manured on the dry land, and the supply of manure settles the area under this crop. Manure is seldom given to other crops than ragi, except where cholum is largely grown, when that crop receives some of the manure, pulse and oil crops do not receive manure.

On wet land in places manure is given to the crop of paddy by previously growing leguminous crops and ploughing them in, also by collecting leaves and weeds and trampling them into the mud; and thirdly, by the use of the house refuse, chiefly composed of the ashes of cowdung.

The average weight of manure to the acre is:—For dry land from 2 to 5 tons, consisting of ⅔rd ashes ⅓ litter near large towns; near the villages entirely dried dung; for wet land no figures can be given.

In the best instances in the Talkad, Malvalli, Mundium, and Yedatore taluqs.

A crop of hesseru, udu, alusandu, and hurale mixed, is partly grazed, and then ploughed in, or more rarely, hemp grown from 1 to 3 feet high is ploughed in.

The ashes from the village and the green leaves and stems of calotropris gigantea, a species of convoloutus (*sic*), wild castor-oil and other shrubs; also the leaves of the hongay and banyan where procurable, are pushed into the mud.

In the worst instances no manure is given, and every intermediate stage is to be met with. Generally where the land is held by Brahmins and let on wara (½ share) less attention is paid to manuring, and the cultivation is in all respects inferior.

Bangalore District.—The proportion of land manured is about ⅙th, except round the neighbourhood of Bangalore, where almost the whole of the land is manured yearly within a radius of 8 miles.

The average weight of manure given to the acre is:—To dry land—Round Bangalore about 6 to 8 tons town refuse, less in the district. To wet land—Very little. Green manuring is also in small quantity, as the supply is insufficient.

In the neighbourhood of large towns the land is constantly manured. In the immediate neighbourhood

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Mysore.

Mr. Harman.

of villages the land is frequently manured. Distant fields are not manured.

Is there any customary rotation of crops or fallows? state it.

Dry land—Mysore district.

1st year cholum followed by a gingelly or a pulse crop.	Unmanured.
2nd year ragi - - -	Manured.
or	
Harica, if manure insufficient.	

This is frequent, but hardly customary, as the crop sown depends first on rainfall, at particular season, second, the supply of manure which regulates the area under ragi.

Wet land, under channel cultivation.

Pulse crops, viz., uda, hesseru, alasandu, hurala grown in hot weather, partly to give a little food to people and stock, partly to plough in as manure, followed by paddy transplanting from seed beds in July and August and manured.

This cultivation when properly conducted leaves little to be desired, except deeper cultivation; but it is a question whether grain other than paddy could not be grown requiring less water, and so permitting an extension of area of irrigated land by the rich river water.

Wet land under tank cultivation.

Continuous cropping with paddy is the rule, together with insufficient manure in the majority of instances. On some of the land two crops are raised per annum, on others one. The cultivators of these lands might learn a lesson from those cultivating channel irrigated lands, in the way of growing pulse crops for manure.

Dry land—Bangalore District.

There is no rotation. The main crop is ragi, and with this is sown in rows the pulses avaray and togaray, the oil seeds hutchellu and castor-oil, and rarely cumbu, sunu, and mustard.

These extra crops are rarely *all* sown together, generally ragi and avaray, ragi and togaray, ragi avaray and castor oil, ragi, hutchellu, avaray, sunu.

Fallows are unknown in any part of Mysore I have visited—that is, fallows interpreted as land cultivated but not cropped. Land may be given up or left idle, but this is not fallow. If English ploughs were used fallowing for the hot months would in many cases be practicable and advantageous, and lead to lengthening the season by having the land ready for sowing with the first rain, instead of then having to commence the ploughing. This would allow two crops per annum on part of the land instead of one; thus introducing into the Bangalore District the rotation of the Mysore District,—

1st year.—Cholum.
Gram.
2nd year.—Ragi with manure and pulses.

CENTRAL INDIA.

Central India.

Mr. Wingate.

Bhopal.

Crops manured.	Manure per acre.	Rotation.
Indian-corn Opium - - Sugar-cane Rice - -	25 maunds annually per acre.	Indian-corn Rice. Opium. Sugar-cane.

N.B.—When manure is not procurable hemp is sown in June and cut and ploughed in in August.

Baghelkhand.

Crops manured.	Manure per acre.	Rotation.
Wheat - - Rice - - Cotton - -	Manured annually, but not in same field.	Rabi and kharif alternate.

Regular manuring is rare. "The rule in Rewah for instance, in all but the very large villages, is to march the population, after 7 or 10 years location in one place, to another more remote but still situated within the circle limits of such village. The village people then settle in this new spot and all refuse, &c. is allowed to accumulate there for years, and when considered sufficient to nourish the land the village site is changed. This system of marching and settling goes on until all the circles in which a village is divided are manured. When a village is thus deserted the land left behind is most fertile, and chiefly let to Kachis at as high a rent as Rs. 30 per khami, or say Rs. 15 per bigah.

"The practice of carrying manure from a village site to a field is rare and confined to 'Bandh Bundi.'* To these lands manure is conveyed neither by bullock nor cart, but in baskets each containing 10 seers of manure, and it is said that about 200 baskets will suffice for an acre, and the weight will thus be 200 × 10=2,000 seers=50 maunds."

Western Malwa.

Crop manured.	Manure per acre.	Rotation.
Indian corn	Annually sown in manured land, which is irrigated in abi season.	Jowar and cotton alternate.

Rutlam.

Crops manured.	Manure per acre.	Rotation.
Opium - - Sugarcane	220 maunds per acre.	Gram (on virgin soil) followed by wheat; then jowar, and a fallow (when land is exhausted).

Deputy Bheel Agency Mánpur.

Irrigated land is manured constantly, 200 maunds per acre.

Crops manured.	Manure per acre.	Rotation.
Indian-corn Jowar - -	Are manured occasionally 40–60 maunds per acre.	Wheat and grain rotate with jowar and túr. Poppy follows Mukka.

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Hyderabad.

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The garden,* tabi rice, and sugar-cane lands are always manured. Out of the manure collected, or procured by the cultivators, the necessary quantity, which is very large, goes to manure the above lands. If there still be more manure left, it is given to the other crops in a fixed order, in which the tabi rice stands first.

Castor-oil seed, mung, and cotton are not manured at all, for they are considered by the cultivators as reclaiming crops, their leaves, roots, &c. being supposed to do much towards fertilizing waste and outlying land.

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* Sloping tracts of land embanked to retain water, which after accumulation for some time renders the land soft and fertile, and particularly well suited for growing wheat, &c.

* Garden crops include opium, maize, potato, yams, chillies, onions, garlic, &c. Tabi rice is the late rice sown in the winter.

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If manured, wheat and barley crops would certainly produce a more splendid and plentiful harvest; but very little or nothing can be spared for them because of the wholesale appropriation of manure by the garden, tabi, and sugar-cane crops. In some talukas, however, the grain crops are moderately manured once in three or four years.

As to the proportion of the whole cultivated land which is manured, it is said that in the different districts it varies from 8 to 20 per cent. The whole manured land in Telingána I believe amounts to 16 per cent.

An approximate estimate may be formed as to how many acres of land it is possible to manure from the dung of cattle and goats collected during the rain, and how many by herding cattle or goats on land during the other seasons. The question is,—

1st. The number of cattle, goats, and sheep in the villages of the province.

2nd. The quantity of dung which can be collected in the rainy season.

The district officers give us no help in respect of the first of these queries, but from my personal inquiries made in the taluka of Utraf Balda, I can give the following data:—The dung of four cattle, viz., a cow, a bullock, and two buffaloes, collected throughout the four months, together with the ashes, sweepings, leaves, &c. which are mixed up with the dung in the pits kept for the purpose, will make about 180 maunds (about 6 tons) of manure. Under the second head all the district officers (except those of Yelgunda) have submitted detailed statements. The statements sent in by the talukdars of the districts in the Eastern Division appear to be correct, and from them the following results have been obtained. The number of cattle in the Eastern Division of the Telingána country amounts to about 1,009,835. Calculating according to the above estimate, *i.e.*, four cattle produce 180 maunds in four months, the amount of manure collected from all the cattle of the division would be nearly 45,442,575 maunds.

Now taking 400 maunds to be the average amount of manure given to a bigha, the number of bighas manured from the above quantity would be about 113,600, which would be about $\frac{1}{14}$th of the total cultivated area of the division in 1284 Fusli.

But there cannot well be quite so large an amount of the manure, and what is used is not utilised over so large a surface as the proportion just named. Two considerations go to support this view, (1) in the total number of cattle given those belonging to the non-cultivators have been included, but the dung of these is, for the most part, not available to the cultivators; and (2), the quantity of manure bestowed on the sugar-cane and garden crops is in some talukas much greater than the average of 400 maunds per bigha deduced. The number of goats and sheep in the division amounts to 1,715,591. About 2,000 goats or sheep on the average are supposed to be quite sufficient to manure one bigha in one day. Calculating from these data, it will appear that during the three months Chet, Baisak, and Jeth, so many as 77,220 bighas can be manured by folding sheep, &c. on land, *i.e.*, about $\frac{1}{20}$th of the total cultivated area of the division.

In our Mahratta country manuring is not at all affected by the consideration of the kind of soil, but by the nature of the crop to be raised. The sugar-cane, garden, paddy, and poppy lands being all irrigated are therefore necessarily always manured. To portions of rabi crops also manure is sometimes given. Kharif receives nothing at all. Tabi rice crop is here unknown.

The kind, quantity, and quality of manure are very similar in these districts to those in Telingana. There is a difference in one respect, namely, that the manure given to sugar-cane land in Maratwári is only half or one-third of that given in Telingána.

Only about from three to seven per cent. of the cultivated area is yearly manured. The low percentage of manured area in Maratwári may be accounted for by two considerations.

1st, there being here no other sources of irrigation excepting wells, the country depends chiefly on rain-water, and the irrigated area does not consequently amount to more than three per cent. of the cultivated area. It is believed by the cultivators that lands which cannot be irrigated from artificial sources, and depend upon rain-water only, are much injured by being manured when the monsoon fails, and that being left dry, manure would do injury by more rapidly withering up the plants. 2nd, there being very little or no jungle in this portion of the country, fuel has to be obtained from cattle dung made up into cakes, which are bought and sold for fuel. The cultivators consider that by subjecting cattle dung to this process they realize much more than they could from any addition to the value of the crop that would be derived from the use of the cattle dung as manure. Here it will be better to give in full that portion of Dr. Bradley's report on Dowlutabad Sircar which treats of manure. It is as follows:—

"The natural fertility of the soil of India has occasioned a neglect of the important subject of manures; in these districts its chemical constitution exhibits a rich amount of inorganic salts, the various quantities of which are essentially requisite in obedience of a fixed law of vegetable organism for the perfect development of the several parts of the plant. It is in trap soils that we may look for a bountiful supply of aliment for the vegetable world, the amount varying with local circumstances, but even when so small as to afford but a single grain in each pound of soil a foot deep, it still is equal to 500 lbs. in an acre. Flooding the country during the rains spreads far and wide the soluble salts of the wasting rocks, hence the remarkable fertility of certain trap soils, which are said to possess the power of raising wheat, the most exhausting crop that grows, for 30 years without a fallow, recruiting its lost energies by the restoration of these salts during the rains, and in some countries, I believe in the Azores, the most luxuriant crops are raised with no other manure than that afforded by pounded trap rocks strewn over the land. These rocks, if examined into, will be found to produce abundant materials for a soil when reduced by the action of the air; for instance, in felspar we shall obtain potash, alumina, silica, and lime. In hornblend, magnesia and iron; the zeolitic minerals are composed of silica, alumina, lime, soda and iron, and in chalcedony silica and alumina, whilst in quartz we find silica in a pure state, and in jasper mixed with iron. Here there are materials for a soil highly favourable to vegetable life, which are brought into active operation by the rains, and, unlike the evanescent character of soils enriched solely by vegetable matter, are permanent in effect. The usual practice is not to manure any crops but sugar-cane, poppy and pán, the source from whence this is derived is the village mixed and, occasionally, folding cattle; a very valuable manure for cane lands lies totally neglected in the heaps of cane ashes beside the sugar mills, and are not deemed sufficiently worth returning again upon the land, which were it done, abounding as they do in silicates, could not but prove highly useful to the plants, which it is well known particularly need these supplies. Green manures are occasionally applied to worn out soils. The green stalks and leaves of the tobacco plant are always ploughed into the land, after the crop is pulled; nothing can be more injurious and unfair towards the soil than the pernicious custom of converting the excrement of the cow into fuel."

A regular rotation of crops is followed in the Telingána districts in the inferior descriptions of soil (termed chilka soil). When waste land is prepared for cultivation, crops producing oil seeds are generally grown for the first year; the next year the land is put under yellow joar, and this is followed by sanva and kudru. If the land lies near a village, facilities for manuring the soil are afforded, and therefore a mandwa crop is generally raised. In the better descriptions of land, if the soil has been exhausted by joar crops gingelly

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seed and úrd are raised on it, and sometimes hemp. A mixed crop of kudru and túr is also raised. A jowar crop is also sometimes followed by a cotton crop. By constantly cropping the soil with yellow jowar it gets exhausted, and therefore joar is seldom or never grown for two successive seasons in the same field. In the better descriptions of waste lands (regar and milwan), in which rabi crops are grown, kulthi, lakh, or castor-oil seeds are first sown; this is followed in the next season by kulthi, gram, masur or peas, &c. In the third year joar mixed with linseed or kurdi is sown. After that, a rotation of joar and kulthi crops follows. In irrigated lands, in which paddy is grown, no regular rotation of crops is followed, but sometimes sugar-cane and betel are raised. The irrigated lands of the Telingana country generally yield two crops in the year, and if the soil gets exhausted, and the cultivator thinks a fallow necessary, he raises only one crop that year.

In the Mahratta country, too, a rotation of crops is observed. If waste land is prepared for kharif cultivation, bajra or cotton is first sown. For two or three successive years nothing but bajra is raised. This is followed by moong, úrd, mott, hulga or hemp, and when the land reaches that condition when ploughing becomes necessary, a tur crop is last raised. The roots of this crop strike deep in the ground, and as this loosens the soil ploughing is easily carried on. When waste land is prepared for rabi cultivation, joar or kurdi is first sown, this is followed by wheat or joar for four or five successive years, after which gram is raised for the season. When the ground requires ploughing, any one of the kharif crops is sown, and then next year the ground is ploughed. In wet cultivation, if sugar-cane is raised one year it is followed by paddy next year. No regular rotation of crops is otherwise observed in wet cultivation in the Mahratta country.

CHAPTER I.—QUESTION 7.

Have any attempts been made by the Government or private persons to improve agriculture in your province, either in the way of introducing new or improved implements, or new staples, or improved seed, or better methods of cultivation, or better breeds of cattle, and so forth, and with what result? Have you any suggestion to make for such improvement? Is there any Government model farm in your province? Or have any estates under the management of Government or of the Court of Wards been used for the object of making experiments or setting examples of improved agriculture? If so, state the system of management, whom they were placed under, and what the results, financial and agricultural, have been? Have any improvements been made in the breed of cattle, in the forms of ploughs, carts, sugar mills, or any other agricultural instruments, or in the mode of drawing water from wells? Have any agricultural exhibitions been held in your province, and have you observed that any good result has been obtained from them? Was anything exhibited the imitation or adoption of which would have been useful to and practicable by the ordinary cultivator? And, if so, was there any willingness to imitate or adopt such improvements? Have you observed that there has been any deterioration of the soil, or that crops are worse than they used to be within your own experience? Does any such question specially arise in case of irrigated land? State specifically on what facts you base your replies? Where there is any popular belief in such deterioration, state what facts are adduced in support of it?

PUNJAB.

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The Introduction of New Staples.—Immediately after the annexation of the Punjab, in 1849, the attention of district officers was directed to this subject. Small quantities of various seeds were distributed to them on some occasions by Government, and on others by the Agri-Horticultural Society of Lahore.

It was hoped that such new crops, if successfully grown in small quantities at the head-quarters of each district, would spread from these centres. In the majority of instances this expectation has been disappointed. I notice the principal staples so experimented with, and the result to date in each case.

Sorgho Sucré or Imphi.—Experimental sowings of small quantities of this crop have been continued at the head-quarters of a number of districts with more or less persistency for now 20 years past. It is an autumn crop with conditions of growth similar to those of joár (Sorghum vulgare). At the same time it grows more luxuriantly, and contains much more saccharine matter. For both reasons it would presumably be a valuable addition to the autumn fodder crops. In several districts, especially Rawalpindi, Siálkot, and Kángra, the agriculturists were induced to sow it experimentally, but they gave it up after trial. It is now seldom or never seen outside the gardens of the district and municipal committees. I do not find anywhere an exact account of the reasons for the agriculturists' disinclination to cultivate the crop.

Oats have been continuously sown at the head-quarters and tahsíls of several districts for 25 years past, with very fair success. They thrive well on such land as is ordinarily sown with wheat and barley. But except at the Government studs, and to a very limited degree in our military cantonments, there is no market for the produce. The people will not eat the grain, and in their judgment the straw is not much better fodder for their oxen and milch cattle than that of wheat and barley. The crop consequently does not establish itself.

New varieties of Maize.—A little has been done lately, as in the case of *sorgho sucré* above, with a view of introducing new varieties of maize, but as yet with no outcome worth notice.

Carolina Rice.—From 1870 attempts have been made in selected districts to introduce Carolina rice. In one or two places (as for instance in Chamba), the crop grew well, but the rice produced was not liked, and the husking machine in common use broke the grain. The experiment consequently fell through.

Flax.—In 1854, experiments, the success of which at first appeared not improbable, were commenced with a view to extending and improving the cultivation of flax in the Lahore and Amritsar divisions. The district officers under Government instructions urged the agriculturists to extend their flax cultivation; Government offering rewards and undertaking to purchase the produce, which was actually done to the value of Rs. 50,000, the produce being resold without loss at Kurrachi. The crops grown produced abundant linseed, but little or no marketable fibre. The conclusion being arrived at that the production of fibre needed more skill than the agriculturists could give to it, the Government ceased to urge the cultivation of

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the crop. But subsequently, from 1860 to 1865, some merchants of Belfast kept an agent at Siálkot, who imported seed, advanced it to cultivators, looked after their crops, and tried to teach them proper methods of steeping the stalks with a view to the production of good fibre. These efforts resulted in the production of a limited amount of good fibre. But they also ultimately demonstrated to the agriculturists that the crop was not, at its best, much more remunerative than wheat. And at the death of the agent in 1865–66, the Belfast merchants, seeing that its cultivation was not likely to grow to any very large proportions, withdrew from their venture. About 22,000 acres of flax are cultivated in the Punjab. The local product is much poorer in fibre, but richer in oil, than the flax of Europe.

Cotton.—The attempts to improve and develop the cultivation of cotton in the province have been most numerous and persistent. From the earliest years of the administration, foreign seed was imported and distributed to district officers. The native cotton is of shorter and coarser fibre than Egyptian and American cotton; and the object aimed at in the distribution of foreign seed has been mainly the local production of a cotton of larger yield and longer fibre. The annual reports from the earliest period contain notices of the efforts thus made to develop the growth of foreign descriptions of cotton.

When the war in the United States cut off the supply of cotton from America,* on which the English manufacturers had till then relied, and the price of cotton was consequently greatly enhanced in India, every effort was made by district officers, under instructions from Government, to encourage the agriculturists to pay more attention to the cultivation of cotton, and the previous efforts to introduce good foreign descriptions were redoubled.† Various gentlemen (officials and others) proved by experimental cultivation that foreign cotton could be successfully grown; and in 1870 a canal engineer (Mr. Login) demonstrated that by adopting the Egyptian system of sowing on raised furrows 8 inches high and 3 feet apart, in irrigated fields, an unprecedented yield could be obtained even with the native variety of cotton.‡ But the ultimate outcome of all our efforts as yet is that the agriculturists adhere both to the native cotton plant and to their own methods of cultivating it.

The area of cotton cultivation in the Punjab has been carefully observed for 12 years past. It does not usually exceed 700,000 acres; about 4/7 of the crop is irrigated, and the rest is dependent on rain only. The average yield of cleaned cotton per acre is believed to be something less than 80 lbs. The produce may be taken at 400,000 cwts. in an average year, of which usually one-third is exported, partly by boats down the Indus, and partly by rail eastwards. There is a small export of Indian cotton cloth westward into Afghánistán, from 50,000 to 60,000 cwts. The average wholesale price of cleaned cotton in 1876–77 was Rs. 20 per cwt.

Potatoes.—This crop was unknown in the Punjab before annexation. Its introduction in the vicinity of all our hill stations followed immediately on annexation. It is principally grown in the hill tracts of the Rawalpindi, Hazára, and Kángra districts, and in the Hill States round Simla, and to a very small extent near our larger plain stations. The extensive consumption of this vegetable in our military and civil stations has been the stimulus under which its cultivation has established itself. But to a very limited extent it is gradually becoming an article of native diet. The estimated area cultivated with this crop and its yield is said to be as follows:—

District.	Acres.	Yield per Acre. Maunds of 40 Sers each.
Near Simla - - -	Not known	25
Kángra - - -	448	11½
Near Dalhousie - -	125	60
Rawalpindi - - -	458	50
Hazára - - -	600	50

Other European vegetables have been sedulously cultivated by the local committees at the head-quarters of each district, but except in a small degree near our larger towns they are little cultivated outside the gardens of the local committees and English officers.

Tea.—This has been the most successful of all our attempts to introduce new staples.* In the year 1848 two small tea plantations were established in the Kángra Hills by Dr. Jamieson, the superintendent of the Botanical Gardens of Sahăranpore. The experiment proving a promising one, the Government of India in 1852 directed its extension, and in consequence the Holta Plain (then waste) was taken up for the purpose.

By the year 1859 the success of the cultivation was so well established that Government deputed an officer to assist capitalists desirous of forming tea estates in buying suitable land from the native landowners.† This same officer, Major E. Paske, returning to the district in 1867, found a thriving tea plantation on almost every piece of waste land secured in 1859 for the purpose. The Lieutenant-Governor (Sir R. Montgomery), in a memorandum dated 13th December 1864, recorded that when he previously visited the Kángra District in 1860 there was hardly an acre of tea cultivation outside the Government plantations, but that between then and his second visit in 1864, 17 estates, with an area of 15 square miles, had been created by European capitalists, and that the natives themselves were growing tea in 47 villages.

Major Paske, writing again at the end of 1872, reported the existence of 13 estates owned by Europeans and 15 owned by natives, the largest being 1,190 acres, with 190 acres under tea plants, and the smallest 13 acres, with 11 under plants. Some of the estates of intermediate size had from 400 to 500 acres under plants. In addition there were small plots of tea cultivation aggregating 681 acres. The entire acreage devoted to tea cultivation in 1872 was 7,732 acres, of which 3,292 were under plant; (⅔ mature, ⅓ immature). The total annual yield had risen from 2,41,332 lbs. in 1868 to 4,28,665 lbs. in 1872. A return furnished to the Government of India in October 1877 shows that the area *under plant* had then increased to 4,611 acres (besides 1,773 acres under preparation for planting) and the annual yield to 7,23,088 lbs. The following statement supplied to me by the Deputy Commissioner of Kángra shows the extent to which Europeans and natives respectively share in this industry:—

Years.	Plantations.		Area under Tea Cultivation.	Approximate Annual Yield.	
	Number.	Owned by		Lbs.	Value Rs.
1878 - -	35	Europeans	4,787	5,60,483	4,16,669
	1,099	Natives -	3,146	2,26,611	1,13,305
Total -	1,134	—	7,933*	7,87,094	5,29,974

* This probably includes land taken up for planting and not yet planted out.

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* See Annual Revenue Reports from 1860–61 to 1864–65.

† Selection from Financial Commissioner's Records, No. 11.

‡ The late Mr. Login's experiments were made at his own expense on very small areas. They were subsequently successfully continued at Government expense for two or three years on 50 acres of land at Chandi, near Umballa. Among the papers appended will be found a report in which he gave an account of the principles on which his experiments were based and of the manner in which he applied them.

* Punjab Record, 1851–53, page 194.

† Major Paske's report on.

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The Government withdrew from its experimental cultivation, selling its Holta estate to a European capitalist in 1865. The cost of cultivation (picking included) averages Rs. 60 per acre, and the yield of mature, *i.e.*, over three years old plants, 200 lbs. The cost of manufacture subsequent to picking is six annas per lb. The best fields yield from 300 to 400 lbs. per acre. The tea is largely exported to the London market. The cultivation is increasing both by Europeans and natives, and great advance has been made in ascertaining the conditions best suited to its culture. Situated as the industry is in a populous agricultural district, there is abundance of labour available. And the relations between the European planters and the local native population have hitherto been of the best.

Tea cultivation has also been commenced in the Simla District, 120 acres being under plant. It was tried in the Hazára and Rawalpindi hills, but has hitherto failed there.

It may be remarked in conclusion that this industry, though originally started by the Government, is entirely dependent for its development and prominency on the European enterprise engaged in it. If that enterprise were withdrawn the native cultivators would probably fail both in the preparation of the tea and in its exploitation in the European markets.

Cinchona.—A very earnest attempt was commenced in 1864 by Major Nassau Lees,* one of the gentlemen interested in tea cultivation in Kángra, to introduce the cultivation of cinchona ; and one of the Kángra planters is still giving his attention to it, but hitherto the cultivation has not succeeded ; the apparent cause of failure being that the climate is too dry, and in the winter too cold.

China Grass.—Attempts to cultivate China grass have hitherto led to no results, for a different reason, viz., the difficulty of inventing suitable machinery for cleaning the fibre. The Government of India have twice offered a large prize for the invention of such machinery, but this will no doubt be noticed in the replies submitted by the North-West Provinces in connection with the Saháranpore gardens.

Silk.—Small experiments, having for their object the introduction of sericulture in the Punjab, have been tried at different times during the past 30 years in nearly all the submontane districts of the province, the experimentors being in nearly every instance the civil and medical officers of the province. For a summary of these experiments I would refer to Mr. Baden Powell's Punjab Products, pp. 161 to 177. I should serve no practical purpose by recounting them here, for they have all the same history. The result in nearly every case showed that silk cocoons could be easily raised at a great profit ; but beyond this stage the experiments never proceeded, except in one instance. The subject was taken up four or five years ago in the Gurdáspur District by Mr. F. Halsey, an independent gentleman, who had settled in the north of that district. Following up successful efforts to introduce the growing of silk cocoons made by the civil officers of the district, he established a small silk filature, and was working it very successfully up to his death, a few weeks ago. For three years past the district committee at Gurdáspur, with Mr. Halsey's assistance, has held exhibitions of silk cocoons. For the best cocoons exhibited prizes are given annually by the committee, aggregating Rs. 1,000 in value, to which Mr. Halsey usually added. This gentleman had also offered three prizes, aggregating Rs. 1,000, for the best plantations of Chinese and Philippine Island mulberries in the Gurdáspur District, and the same sum for the Kángra District ; and he purchased for his filature the cocoons of all those who did not wish to reel their own silk. The Deputy Commissioner of Gurdáspur reports that the cultivation of the cocoons is now a well-established source of profit among the agriculturists. It was at first confined to Kashmíris, but has lately been taken up by many among the agriculturists. The death of Mr. Halsey is no doubt a severe blow to it, but there are grounds for hoping that some one may be found to take over and maintain the filature, and thus keep up the newly-awakened interest of the agriculturists in sericulture.

Silk goods are manufactured in all parts of the Punjab, and especially at Amritsar and Mooltan. The raw silk thus consumed is imported principally from Afghánistán, Bokhára, and Kashmír, and the gross imports were estimated 15 years ago to be worth Rs. 20,00,000 per annum. Of this a portion passe on to other provinces. But it is evident that seri culture and silk filatures might be developed int most profitable industries. I annex a few remarks o the subject furnished by Colonel F. Millar, the deput commissioner :—

"I believe the cultivation of cocoons is now indepen dent of prizes ; it has established itself, and woul not, I think, suffer if the prizes were withdrawn although I think prizes should continue for some tim to come.

"At first Kashmíris took up the cultivation o cocoons, but now agriculturists and their families hav done so, as well as Brahmans, Sayads, Fakirs, an other classes ; outsiders are not apparently attracte by the prizes ; none have as yet competed ; all havin been taken by persons residing in the district, an this year the first prize was awarded to a Lambardá of Gurdáspur.

"I am of opinion that this industry has now becom thoroughly established, and is likely to flouris although it has sustained a blow by the death of M Halsey, who took much interest in it; distributin young plants of the exotic mulberry gratis to a wishing to plant them. He also purchased the cocoon of all parties who did not wish to reel their ow silk.

"One Zamíndár of this district purchased eggs fo 1 rupee, and made a clear profit of Rs. 22, after payin all expenses, and this has induced many others of th same class to commence operations.

"The men work in the fields, while the wome employ themselves in taking care of the silkworms."

Agricultural Implements.—Our attempts to improv the aids to agriculture (leaving the improvement o cattle to subsequent notice) have been confined t artificial manures, improved sugar mills, and ploughs.

In 1874 patent iron sugar-cane mills (Thomson an Mylne's) were supplied experimentally to severa districts. But trials showed that they were not fitte for the small cane of the Punjab, and failed to crus it sufficiently.

More recently in the present year a suggestion wa made for the importation of light ploughs manufacture by Messrs. Ransomes, of Ipswich. It was shown b the late Mr. Halsey of the Gurdáspur District tha the ploughs were sufficiently light for the cattle o the country, and that they could be delivered a Lahore at a cost of Rs. 24 each. But the suggestion was abandoned, because the shares could no have been renewed by native workmen ; in fac supplies of them could only have been obtained fro England, or from Government workshops. But th late Mr. Halsey cultivated 250 acres of land a Sujánpur in the Gurdáspur District with Englis ploughs drawn by cattle, which, though no doub superior to the ordinary plough cattle of the country, were yet bred by their owner from selected country stock, and he obtained crops from the land far superior to any ordinarily raised in the neighbourhood.

For a not dissimilar reason attempts made shortly after annexation to improve the Persian wheel used all over the Punjab for raising well water for irrigation have failed of accomplishing any practical results. It is easy to indicate how the well gear could be improved, and made to do a larger duty with the same draught power now employed, but all the improvements yet suggested require more skill for their construction and maintenance than the rural artizans possess. Well gear which cannot be made and repaired by the ordinary village artizan is useless to the ordinary agriculturist.

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* Punjab Revenue Report, 1871–72. Manual of Cinchona Cultivation, 1876.

Sugar factory at Sujanpur.—The enterprise of the late Mr. Halsey also succeeded in starting at Sujánpur sugar mills for manufacturing sugar. The capital (Rs. 4,00,000) was subscribed principally by 88 European gentlemen, many of them officers in the Punjab, and about Rs. 32,000 by native merchants. The mills are only in their first year; but there is little doubt that they will yield large profits. They are worked by water power, supplied from the Bári Doáb Canal, and the machinery was imported from England. The objects aimed at by the company are the manufacture of sugar suitable for native consumption and the manufacture of rum.

If the profitable character of these mills is established, there is reason to believe that they will be extended, so that other similar companies will be started.

Cotton and woollen mills have not yet been started in the Punjab. But if European enterprise and capital is once attracted to the richer districts of the Punjab, there is little doubt that in sugar, cotton, wool, silk, and other products, it will find abundant field for profitable employment. The bearing of such enterprises on the prosperity of the agriculturists who supply the mills with raw products is patent. And it is in the development of such enterprise, whenever practicable, rather than in legislative schemes and systems of local Government, that the true remedy is to be found for the indebtedness, the poverty, and the unskilfulness of the native agriculturist.*

Model Farms.—There is no model farm in the Punjab, the only attempt yet made to establish one came to an end at the close of 1876. Its history was as follows:—

In 1873 the Government of India offered to assign to the Punjab the services of a trained gardener, and Rs. 4,000 towards the expenses of an experimental farm. The offer being accepted, the gardener, Mr. Lloyd, was first employed on a small area of land near Umballa, on which experimental cotton cultivation had been attempted; but in 1874 he was placed in charge of 176 acres of Government land near Amritsar. The land was of varying quality, some decidely bad, but it was conveniently situated near a large town.

After three years' trial it appeared that the farm had been steadily cultivated at a loss (not reckoning the superintendent's salary), and it was therefore broken up at the commencement of 1877.

If the farm had really served the purposes of a model farm, an effort to keep it up in spite of the expense would probably have been made. But it was on too small a scale to furnish any useful results; and it was not in the hands of a man who by his antecedents could have any real knowledge of the agriculture of the country. The proper scope and aim of a model farm was thus described by Mr. Egerton, when Financial Commissioner, at para. 33 of the Revenue Report for 1873-74:—

"The progress of the experiment of a model farm depends much upon the plan of operations adopted. It is to no purpose that superior staples are grown before the eyes of the people, if the mode of cultivation is totally foreign to them. The only means by which any real aid towards the development of the resources of the country can be afforded is by a study of the system of tillage which is in ordinary use, and by applying to it such improvements as the people are competent to appreciate. Any movement towards improvement in agricultural produce must therefore initiate with a full appreciation of the mode of agriculture to which the people are addicted, and in which they have confidence; and only those innovations will be accepted by them which tend gradually to ameliorate this method, and not those which involve a total abandonment of their time honoured habits."

On the same subject I append a memorandum dated 10th January 1872, written by the late Mr. F. Halsey.

Farm in the Dera Gházi Khan District.—The Deputy Commissioner of Dera Gházi Khan has a farm of 19,000 acres (1,100 cultivated on the local system by tenants) in his district, and another considerable area in the Biloch Hills, near Fort Monro. The objects of the farm are to induce hill Bilochis (hitherto strangers to agriculture) to settle there and learn agriculture, to introduce certain improvements in the breeding of Biloch horses, to improve the cattle and sheep of the district, and to distribute fruit and shade trees. The farm pays its own expenses.

Estates under the Court of Wards.—In the Punjab it has not as yet been found practicable to use any estates under the Court of Wards for the object of making experiments or setting examples of improved agriculture.

Improvement of Sheep.—Rams have been imported from England in small numbers, and sent to the Hazára and Shahpur districts. Up to a late date the report of the results was not encouraging. It was stated that the fine fleeces were much torn and spoilt by the thorny bushes common on the lower grazing grounds; but the last report from Hazára states that the breed is liked for its size. A number of other superior rams have been for some years past distributed to the districts where there are most sheep, but it is only quite lately that any exact accounts have been taken of the result. In 1877 it was ascertained that of 100 rams distributed 50 had died. As regards the progeny, the reports do not show any material progress as yet in the improvement of the breed. On the other hand, the leading agriculturists in each district are by no means indifferent to the matter: and they willingly accept the charge of the rams, and comply with instructions concerning their keep and use. Sixty-four rams are now made available each year at the Hissár Cattle Farm for distribution to Punjab districts free of charge.

Improvement of Cattle.—Similar means have been adopted for the improvement of the horned cattle. Bulls have been distributed from the Hissár Cattle Farm to as many districts as applied for them. The first distribution of 30 bulls took place immediately after the annexation of the Punjab. But the subject was lost sight of for some years, and it was only in 1876 that attempts to ascertain and watch the results were revived. The reports received were of varying character; but on the whole they showed, that in those cases in which the selections were judicious, the bulls were appreciated by the breeders, and rendered valuable service in improving the breed of draught cattle. Thirty-two bulls are now made available each year at the Hissár Cattle Farm* for supply to Punjab districts free of charge. The keep of the bulls costs the agriculturists little or nothing. It is usual to make over a bull to some large central village, and he is allowed to roam free with the village cattle. The aggregate progeny of the bulls is as yet insignificant in numbers.

Cattle Fairs.—On this subject I subjoin an extract from the Revenue Report for 1876-77. The return quoted therein is also appended. Since this extract

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* The following extract from a report by the late Mr. F. Halsey, on the local exhibition of silk cocoons in Gurdáspur, dated 1st of May 1876, is worth quoting:—

"If cocoon growing is to become a staple product of this district, it is to the Zamíndárs we must look for their production. There is little doubt in my mind that the whole of the Government revenue could be paid by the villagers from the proceeds of their cocoons, which would leave the whole produce of their lands for the village consumption and export; and as it is chiefly in these villages which now are most suffering from debt that the mulberry tree exists in the greatest numbers, we may really hope that with an increase of silkworm farming, the difficulties of these suffering villages may diminish."

* This is an institution kept up by the Military Commissariat Department. It consists of 43,000 acres of waste land near Hissar, and it is devoted principally to the production of horned cattle. The stock on the farm numbered 10,521 on the 31st May 1877. It is in charge of Lieut.-Colonel Robinson.

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was written prizes for cattle have been offered at the Rawalpindi Horse Fair, and a large cattle fair is likely to be developed at that place :—

"The most important fairs are those held in the districts of Hissár, Rohtak, Sirsa, and Amritsar. Of the total of 183,027 cattle attending all the fairs in the province, all but 10,000 were at the fairs in these four districts. The minor fairs were held in the districts of Jullundur, Hoshiárpur, Gurdáspur, Siálkot, Gujránwála, Ferozepore, Jhang, and Montgomery.

"The general result shows a large increase in the number of cattle attending fairs, and this increase is almost entirely in the more important fairs, particularly those in the Hissár Division, where the number increased from 78,804 in 1875-76 to 1,02,357. The important and well managed fairs in that division are well appreciated, because they supply a real want. The cattle of that locality are of good quality, and traders from a distance are always pretty sure of finding the kind of animal they require, and cannot elsewhere procure, while the breeders who send cattle for sale are pretty sure of finding customers. The same may be said of the fairs held at Amritsar in spring and autumn, where some 50,000 or 60,000 animals are exhibited, of which a considerable proportion change hands. On recent occasions, horses have also been sent to this fair, and find ready sale.

"The amount of prizes given varies considerably. At the Amritsar fairs, where 68,857 cattle attended, Rs. 2,990 were distributed in prizes, being an average of 8 pies for every animal that attended; whereas in the Hissár Division the average is under 3 pies. In the latter, moreover, only 144 animals were entered for prizes at all ; whereas at the Amritsar fairs 414 were entered. The Amritsar prize scheme has been carefully revised from time to time, and the increasing success of the fairs held there may be due in part to this, but the increasing popularity in the Hissár fairs seems to show that where there is a good market for cattle periodical fairs will flourish, whether prizes be liberally distributed or not. The number of cattle, however, is not the only test of the usefulness of a fair. The quality of the animals is a very important point, and it is chiefly to effect a gradual improvement in this respect that a liberal prize list adjusted with discrimination is valuable. There is reason to believe that this improvement is really taking place. The demand for bulls of good breed from the Hissár Cattle Farm shows that the improvement of stock is felt to be an object capable of attainment, and well worth attaining.

"In the Sirsa District 40 Hissár bulls were utilized and produced 1,117 head of stock, some of which are very fine specimens. The people appreciate the bulls and their progeny highly. The statement shows that the cattle fairs generally are not only self-supporting, but yield a considerable surplus, which, under present arrangements, is credited to the provincial revenues. The income was Rs. 26,778, and the expenditure Rs. 12,666, leaving a surplus of Rs. 14,112. The minor fairs are not, as a rule, self-supporting, their first starting, and their maintenance for some time, being dependent on the existence of a surplus derived from other fairs. These small fairs, however, serve many useful purposes, and need not be hastily abandoned merely because they cannot at first be taxed in proportion to the expenditure incurred on them. Independently of their value as cattle markets and as a means of supplying an improved breed of cattle, they are popular as local gatherings. At Hoshiárpur a local industrial exhibition was held in conjunction with the cattle fair, and was thought to be a great success. But where the results continue year after year to be incommensurate with the efforts made, and the expense entailed, fairs are sometimes discontinued, as was found necessary recently in the case of the fairs in the Jhang and Montgomery districts.

"The income is raised by means of fees, which are levied in some cases on all animals attending the fair, and in others on all sales effected. In the Hissár and Sirsa districts the latter system is adopted, in Rohtak the former. In Amritsar there is an admission fee for all animals attending, and a separate fee for animals entered for prizes. In almost all cases the fees are collected by direct agency, the employment of contractors having been found disadvantageous.

"Of the Rs. 12,666 expended on cattle fairs, Rs. 6,446 was for prizes, and Rs. 6,220 for expenses of management."

STATEMENT showing the result of CATTLE FAIRS held in the Punjab during 1876-77.

Districts in which fairs are held.	Number of fairs held in the year.	Number of cattle that attended.	Number of cattle entered for prizes.	Amount given in prizes.	Amount of fees collected.		Amount of expenditure other than for prizes.	Total expenditure.	REMARKS.
					On total number.	On animals competing for prizes.			
				Rs.	Rs.	Rs.	Rs.	Rs.	
Hissár	2	28,806	81	819	7,811	—	665	1,484	
Rohtak	2	47,417	54	476	2,970	3	432	908	
Sirsa	1	26,134	9	234	6,346	—	232	466	
Jullundur	1	799	17	325	96	—	152	477	* Rs. 512 were expended on the local exhibition held at the same time as the cattle fair. The District Fund contributed largely to the expenditure.
Hoshiápur	1	245	93	499	—	14	849	*1,348	
Amritsar	2	68,857 and 2,015 horses.	414	2,990	8,552	414	3,703	6,693	
Gurdáspur	1	569	18	16	36	6	6	22	
Gujránwála	1	6,393	31	220	485	—	27	247	
Ferozepore	1	1,026	31	387	45	—	84	471	
Jhang	1	69	6	90	—	—	—	90	
Montgomery	1	2,712	27	390	—	—	70	460	
Total	14	1,83,027	781	6,446	26,341	437	6,220	12,666	

Horse Fairs.—Besides the two Amritsar fairs above noticed, where horses are brought for sale to the number of about 2,000 each year, three large horse fairs are held in the Punjab, at Rawalpindi, at Jhang, and at Sakhi Sarwar in the Dera Ghází Khan District. Attempts are being made to start fairs at other places, but these three are the most important. The number of horses which attended these fairs, and the amount of

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prizes distributed on the last occasion when they were held, was—

Fair.	No. of horses attending.	Aggregate value of prizes distributed.	Aggregate value of sales.
Rawalpindi - - -	2,250	8 000	78,500
Jhang - - - -	500	2,000	—
Sakhi Sarwar in Dera Gházi Khan - -	1,200	2,000	13,500

The Rawalpindi fair has been held from a very early period of our rule; the others are of later origin. The object of these fairs is to encourage horse breeding among the agriculturists of the neighbouring districts. Our native cavalry have always been mainly mounted by horses indigenous to the country; and it is hoped that eventually a still larger and more powerful breed of horses may be thus obtained. In aid of this object, a number of stallions (English, Arab, Stud-bred, and Walers) are kept up by Government, and distributed each winter for service in the districts where the best breeds of horses exist; and all mares previously shown to a veterinary surgeon and branded by him as sound and fit, are served by these stallions without charge. The number of mares so branded is 2,000. In 1864 the number of stallions thus distributed in the principal horse-breeding districts of the province was 43; the present number is 130, viz.:—

English thorough-bred - -	19
Half-bred and Norfolk trotters -	25
Walers - - - -	5
Cape - - - -	1
Arabs - - - -	45
Stud-bred - - -	35

Among a limited number of agriculturists in the portion of the Punjab west of Lahore the horse breeding thus encouraged is of a highly remunerative character, and adds much to their prosperity.

Agricultural Exhibitions.—In the year 1864 an exhibition was held at Lahore, in which specimens of the raw products, manufactures, and machinery of the Punjab were collected from every district and political dependency of the Punjab. The exhibition has produced two permanent results of great value.

The exhibition building, and a very large portion of the articles exhibited, have been formed into a permanent museum. The charge of the museum (for which Government have granted a small allowance) is usually held by some civil officer, selected from those stationed at Lahore for his special qualifications. The number of visitors has increased from 50,000 per annum six years ago to 130,000 in 1876–77. Nine-tenths of the visitors are natives, most of them being country people (agriculturists and traders). The contents of the museum are being added to year by year, and are of great interest and value.

The other permanent result was the preparation by Mr. Baden Powell, C.S., of two volumes, describing the Punjab products and Punjab manufactures shown at the exhibition.

Both subjects are dealt with very completely; and the Administration and the public have at their command in these volumes a complete account of the products and manufactures of the Punjab, such as, but for the exhibition, there would have been little prospect of our obtaining.

Agri-Horticultural Society of Lahore.—I have described, one by one, the different items, in respect of which attempts have been made to improve the agricultural resources of the province. It remains to state how far those attempts have been assisted by private efforts or societies. Immediately after the annexation of the Punjab, the Agri-Horticultural Society was formed at Lahore. The society consists of gentlemen (European and Native) residing in the province; who are nearly all of them members of the various Government services. It is nominally independent of Government, and its formation arose out of the interest felt in the development of the country by the officers employed in it. In the first years of its existence the inquiries of the society resulted in producing some of the best accounts of agriculture in the Punjab which have yet been written. Horticulture, arboriculture, wool, silk, sugar, and other important products also formed subjects of inquiry by the leading members of the society, the results being recorded in the society's proceedings.

Its gardens at Lahore, the seeds of flowers, vegetables and trees, which it distributes to the head-quarters of each district in the province, and its efforts to introduce and distribute new varieties of agricultural and horticultural produce, are of great value, and in these respects the society supplies a want which could not be met in any other way.

Nearly three-fourths of the funds, however, by which it is supported are supplied by Government: thus the society's budget for 1877–78 shows the following estimated income:—

		Rs.
Contributions from -	Imperial revenues -	5,400
	Provincial revenues -	3,600
	Local and municipal rates (each district of the province contributing) - - -	6,150
	Subscriptions of members	1,100
	Sale of garden produce, &c.	4,740
	Total Rs. -	20,990

The society's permanent establishments at Lahore cost Rs. 11,750; and it expends in the purchase and import of seeds from Rs. 4,000 to Rs. 5,000 per annum.

Efforts of European enterprise.—I have already noticed under the head of flax the efforts made by certain merchants of Belfast to develop the growth of flax; and also under the head of tea the success of the European planters in Kángra. Two other English merchants, Mr. Cope and Mr. Coates, of Amritsar and Ferozepore, made valuable efforts a few years ago to develope the trade of the province with Europe, especially in cotton. Similarly, the late Mr. Halsey's enterprise in silk in the Gurdáspur District, the sugar factory which he started in 1877, and his successful use of English ploughs on the small farm which he cultivated, are noteworthy instances of the value of intelligent European enterprise, and of the results it would effect if it could be attracted to the province.

But the Kángra tea industry, and a few other instances such as those above noticed being excepted, the Government is as yet entirely dependent on its own exertions and on those of the officers in its employ for the improvement of the agriculture of the country.

In respect of some forms of industry, such as cloth mills (cotton and woollen) and sugar factories, it is probable that their multiplication by independent European enterprise is not far distant. And such industries, if successful, have an obvious and almost certain tendency to promote the agricultural prosperity of the tracts in which they are established. The promoters of them may possibly be led themselves to take a share in the agriculture of the country. But we shall certainly be more than sanguine if we rely entirely on such speculative prospects for the improvement of the agriculture of the country. And it does not seem too much to say, that until Government makes some earnest and systematic provision for the study and observation of the native agriculture, we shall neither adequately appreciate its existing methods, nor succeed in pointing out the directions in which it is practicable for the mass of the agriculturists, circumstanced as they are, to improve those methods.

Deterioration of Soils.—On the question whether the cultivated soil and the crops have deteriorated or not, the replies of 13 officers employed in various parts of the province, and of one native gentleman, are annexed.

I give a short summary of these replies:—

Colonel Davies, Commissioner of Delhi, has been employed in the Punjab since 1854, principally in the Rawalpindi, Amritsar, and Delhi divisions, states that there has been no deterioration of soil, except on irrigated lands.

The lands irrigated by the Bári Doáb Canal and by the Western Jumna Canal have alike deteriorated. The cause is over-cropping, over-watering, and defective drainage.

Alimulla, Honorary Extra Assistant Commissioner of the Rohtak Settlement, Hissar Division, states that in the Rohtak District for five years past he has observed no deterioration either in canal irrigated or in unirrigated land.

Mr. J. B. Lyall, Settlement Commissioner, whose experience has been gaining during 14 years past in settlement operations in the Amritsar, Jullundur, Lahore, Mooltan, and Derajat divisions, has not observed any deterioration of the soil or falling off of the crops within his experience. He states that there is a popular belief that the yield has decreased, the cause assigned being increasing irreligion, but that the true reason probably is that the land gets less rest than before. He believes that it would be very difficult for any official to observe a decrease of this kind. As to irrigated land, without doubt constant cultivation and application of canal water takes the strength out of it, and in the country round Amritsar a decrease in the yield of irrigated land is commonly asserted to have taken place. Over-saturation combined with insufficient drainage has also spoilt some land near the head of the Bári Doáb Canal in the Gurdáspur District.

Mr. E. C. Palmer, Superintending Engineer of the Bári Doáb Canal, has been employed on that canal for 15 years past; and states that the value of canal irrigation varies with the quality of the soil. Light sandy loam, he writes, is improved by the clayey silt deposited by the canal water, and by the humus left by the crop continuously raised. A stiff clay soil is not similarly improved; but yields less than it would under well cultivation. Clay soils with a substratum of reh are usually injured by canal irrigation; the steady supply of water bringing the reh salts to the surface in great quantity, and rendering it proportionately unfruitful; but there are exceptions to this, for instance, turnips and rice yield well on some reh lands. When land is first aided by irrigation, the crops for four or five years are very luxuriant, thereafter a marked deterioration takes place, but is not progressive. If cultivation without irrigation is attempted on land usually irrigated, a fair crop will not be yielded for some years. A bushel of wheat raised from canal irrigated land will not weigh so much as a bushel raised on well irrigation by $\frac{1}{6}$th. But in the market there is no distinction of price (presumably, I would suggest, because in India grain is always sold in the markets by weight).

Rája Sir Sahib Dyál, K.C.S.I., a jágírdár magistrate of the Amritsar District, who is a considerable landowner, states that the people commonly assert that canal water has impoverished the soil; but the truth is the impoverishment is due not to the canal water, but to over-cropping. The old custom was to take a spring crop from half the land and an autumn crop from the other half. They now try to take two crops from every field. States that the canal irrigation removes reh salts from the soil; instances a village of his own which has been cured of reh or kallar in this way. Recommends a rule whereby no village would get more water than will irrigate half its land. Complains that villages near the head of the canal get more water than is good for their lands, and that villages further down the canal are consequently stinted of a sufficient supply.

Mr. Palmer, the officer whose report is above quoted, being asked to state whether his experience confirms the complaint last mentioned, replies that the facts are entirely otherwise. He says that great care has been bestowed on the distribution of the water, and that as a rule no village gets more than will irrigate one-fifth of its area. The figures of the three years ending 1875-6 show that in Gurdáspur (near the head of the canal) villages to which water was supplied irrigated each year only 13 per cent. of their area; whereas in Amritsar and Lahore, lower down the canal, such villages irrigated 24 and 21 per cent. of their area. He considers it wasteful to give canal water in tracts where the spring level is within 25 feet of the surface. Both for this reason and owing to the abundant rainfall, the use of canal water has latterly been discouraged in the Gurdaspur District, and of course the villages lower down the canal benefit proportionately.

Muhammad Hayat Khan, C.S.I., Judicial Assistant Commissioner of Gurdáspur, states that the land and the crops are worse than they were, because the land gets fewer fallows, and is more steadily cropped. The increase in the population has caused the subdivision of many holdings. By stress of circumstances the cultivators are driven to take two crops a year off the land. Canal irrigation facilitates their attempts. When land is first irrigated it yields very richly, but after three years it deteriorates. The irrigation leaves a sandy deposit which is injurious. The remedies suggested by the Zamíndárs are manuring, rests, and constant ploughings. But they cannot afford to rest the land, and have only as much manure as is sufficient for the very best lands. He recommends that the Zamíndárs be taught the rudiments of agricultural science. This officer has been employed for 12 years past, principally in the Lahore and Amritsar divisions.

Mirza Azim Beg, Honorary Assistant Commissioner of the Jhelum Settlement, has been employed principally in settlement work in the Gujrát, Házára, and Jhelum districts for 22 years past; states that the yield of land is less than it was before British rule for obvious reasons. Then the cultivated area was much smaller, and therefore the best lands were selected for cultivation. For the same reason more pains could be spent on them. And the large waste areas enabled the agriculturist to keep more cattle; though cultivation has now doubled in extent, population has not increased in the same ratio, consequently the agriculturist's labour is divided over a larger area than before. At the same time the cropping is more steady than it was in less peaceful days. States that the universal conversion of the wood and grass-bearing area is seriously injuring the agriculturists by reducing the number of their cattle and their ability to keep cattle, and that every village ought to be obliged to keep one-tenth of its area under grass and copse, or such preserves should be provided in some other way. Their non-existence is an evil hardly less important than the indebtedness of the agriculturists, and will as certainly shortly claim Government's earnest attention.

Mr. P. O'Brien, who has been engineer of the canals in the Mooltan District since 1850; Mr. Roe, who has been settlement officer of the same district for $5\frac{1}{2}$ years; and his native assistant, Hukm Chand (extra assistant commissioner), who has been in the district for the same period; all state that no deterioration of soil or crops is taking place; and that irrigation does not injure the soil. In this district the canal irrigation usually enriches the land with alluvial deposits; the lands on the river banks are similarly enriched by autumn floods; and where land is irrigated by wells only, land is so abundant that yearly fallows are always observed. This is an almost rainless district, and speaking broadly, cultivation, unless aided by river floods or irrigation, is impossible.

Mr. E. O'Brien, the settlement officer of the Muzaffargarh District, which adjoins Mooltan, and is similar to it, on a $5\frac{1}{2}$ years' acquaintance with the district, has arrived at the same conclusion. Native memory looks back with gratitude to the last of the Sikh

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governors, Sawan Mal, and says everything was best in his time. But native opinion does not assert that land and crops are deteriorating. Mr. O'Brien has compared his own estimates of produce with similar estimates made in the early years of our rule, and the comparison shows no falling off in yield. Canal irrigation improves the land, no matter how often repeated, and where noxious salts have accumulated on the surface, washes them away.

Mr. H. St. G. Tucker, who has served for the past 10 years in the Dera Ismail Khan District, principally as settlement officer, has noticed no general deterioration of the soil. There is no canal irrigation to speak of in this district.

The alluvial lands in the Indus yield more richly when first cultivated than they do subsequently, and when old, get poor and weedy. Ten years ago a great deal of such land had only been lately reclaimed. Nearly all the rest of the cultivation in this district is annually enriched by floods from the hills.

Mr. S. S. Thorburn, who has served for 10 years in the adjoining district of Bannu, principally as settlement officer, gives a similiar opinion ; there has been no deterioration speaking generally. In Marwat, a sandy unirrigated tract, dependent on a scanty rainfall, occasional dry seasons create enforced fallows ; on the canal lands of the Kurram the irrigation enriches the soil with silt.

Major E. G. Hastings, who has served in the Peshâwar District for the 12 years ending 1875, and subsequently in the Kohât District, principally as settlement officer of these two districts, states that on irrigated lands he has observed no deterioration'; but that on lands dependent on rain he has observed that the crops on such lands when newly cultivated are richer than on similar adjacent lands which have been longer under the plough. Native opinion asserts that the soil has deteriorated, and gives the following reasons for it: increased population, and consequently more frequent cropping with fewer rests ; increased uncertainty and unseasonableness of rainfall ; less careful cultivation consequent on increased employment of tenants and go-betweens. They admit, however, that the land will yield as well as ever with fair treatment.

I have myself served over six years (1868–74) in the Hazára District, as settlement officer, and subsequently as settlement officer and deputy commissioner in the Jhelum District ; and I do not think it can be stated broadly that land has deteriorated in productive power. There is much force in what is above stated by Mirza Azim Beg, who has worked in the same districts as myself, but I think he generalises too much. Under the Sikh rule the cultivation in some tracts was good, in others, especially the more unsettled tracks, it was rough in the extreme. Under our rule all parts of the country are equally peaceful, and tracts before roughly cultivated are now vastly improved. Similarly, though it is of course the case that land when first brought under the plough yields more richly than it will after three or four crops have been taken off it; I think it is scarcely correct to describe this difference as deterioration of soil. The practical question appears to be this : after the superabundant richness of the first three years has been worked out of new lands, do such lands under the existing system of cultivation continue to deteriorate progressively, or do they give a steady fair yield proportionate to their natural quality ? I have not observed any progressive deterioration of this nature. Similarly, it is quite true that the average yield reckoned on the total area cultivated is lower than it was; or as an agriculturist would perhaps put the statement, after the division of his heritage between himself and six other brothers, much of the land he holds is such as his father 30 years ago would have thought poor stuff. But the obvious explanation is, that it is profitable to cultivate now poorer soils and more distant fields than before our rule. On the other hand, during the past 30 years, a large proportion of the cultivated fields have been much improved, as I proceed to explain. Some open valleys excepted, Hazára is a purely mountainous district, consequently nearly all the fields when in their natural state are sloping ; and I have no hesitation in saying that a vast improvement has taken place during the last 30 years in the character of the Hazára cultivation, by the conversion of these sloping fields into fields level and well terraced. This is not done by the expenditure of money, but by quiet industry, little by little, year after year. Jhelum is not so mountainous a district ; it has hilly tracts, but its main features are high undulating plateaux much cut up by ravines. Here also the fields in their natural state are usually more or less sloping ; the banking up and levelling of the fields was consequently always a prominent feature in the agriculture of the district, but the fields are much more universally banked up and well levelled now than they were at annexation 30 years ago.

In purely hill tracts, and in level tracts at the base of hills, the cultivator has facilities for renovating his lands which are peculiar to land so situated ; that is to say, he can flood his land with the drainage of the adjacent hills, and as a matter of fact such a natural advantage where it exists is never neglected.

Deterioration of Land by Reh or Kallar.—There is one wide-spread form of deterioration in the lands of the Punjab plains which deserves special notice. Reh or kallar consists mainly of a mixture of sulphate and carbonate of soda with chloride of sodium in various proportions. The reh crops out on the surface of soil affected with it in a white efflorescence. Its first action is to absorb moisture and keep the ground dry. But when water is added in sufficient amount it dissolves ; and the solution, unless greatly diluted, prevents the absorption of liquid by plants, stunts their growth, and eventually kills them.

Large tracts of land in the Punjab are thus injured. Speaking roughly, the evil is most wide-spread in the lands irrigated by the Western Jumna Canals, and in the clayey soils of the southern portion of the Punjab. Where it occurs in any appreciable degree, it makes the land barren for the reasons above given. It has consequently been the subject of much investigation. It is now well established that it is not usually conveyed to the soil by canal water or other sources of irrigation. It exists in the soil originally in a diffused and harmless proportion. It is collected on the surface to a harmful extent usually in one or two ways.

(1.) When land is over-irrigated, or otherwise becomes swampy, the reh collects on the surface of the soil and in its upper layer ; on such land it can be cured by plentiful irrigation, accompanied with really efficient drainage. The water liquifies and dilutes it, and if there is proper drainage, washes it off the land.

(2.) In the clayey soils of the southern plains of the Punjab, which are almost rainless, the occasional showers or limited irrigation are sufficient to bring the reh to the surface, but not sufficient to wash it away, and the evil is in such instances incurable, except by irrigation and good drainage as above described.

In 1865 specimens of soil impregnated with reh, and of adjacent water and subsoil were forwarded to England for chemical analysis. The analyst (of the Royal School of Mines) came to the conclusion that the only practical remedy was irrigation accompanied by efficient drainage. This was practically the same conclusion as was arrived at by the canal engineers of the Punjab, Major Fulton and Mr. Garbett, whose reports accompanied the reference to the analyst. The same view is held by Doctor Burton Brown, an officer whose opinion was based both on scientific analysis and on practical experience in the reclamation of such land in the gardens of the Agri-Horticultural Society, Lahore. It will be found expressed by Rája Sir Sáhib Dyál, of Amritsar, as his experience on his own lands, and by the settlement officer of Muzaffargarh, in their replies to the question under consideration. Also, if the replies to Chapter IV. (Irrigation Works) be referred to, it will be seen that the settle-

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ment officer of Mooltan, the canal officer of the same district, Major Grey, whose experience extends both to Ferozepore and to Baháwalpur, and the Deputy Commissioner of Shahpur, all hold the same opinion. Mr. Palmer, the superintending engineer of the Bári Doáb Canal, in his replies appended, Nos. 6 and 8, dissents from this conclusion, believing canal irrigation to be necessarily injurious to land affected by kallar.

I note below* the best papers on the subject, not filed with this report; on the whole evidence there seems little doubt that plentiful irrigation aided by good drainage will usually cure land affected by reh; as certainly as the reckless irrigation of clayey soils and simultaneous neglect of all provision for efficient drainage will develop it in most parts of the Punjab plains.

General Conclusions.—The general conclusions to be drawn from the opinions above summarised appear to be as follows:—

Irrigated Land.—In the Delhi and Karnál districts such land has greatly deteriorated by excessive irrigation, and by the absence of efficient drainage. The Western Jumna Canal, which irrigates these districts, was constructed by native rulers, and was greatly developed by us subsequently to the famine of 1833. But neither in its original construction, nor in its subsequent development was any regard paid to the drainage of the country irrigated. The natural lines of drainage were dammed up by the canal and its cuts, the soil became a swamp, and the whole population were disease-stricken. These evils are now after many years being gradually remedied by the re-alignment of the canal and its distributaries, and by making proper provision for the drainage of the country.

Limited and exceptional instances of similar deterioration occur in the upper part of the Bári Doáb Canal. But with these exceptions, irrigation from this canal has not deteriorated the soil, except so far as it has been combined with over-cropping. Such over-cropping is common at the first introduction of canal irrigation in tracts where it has not before existed. The deterioration is mainly of the nature of exhaustion, and is not progressive after a certain point has been reached. Arrived at that point the land continues to yield fair and assured crops at a cost much cheaper than is possible without canal irrigation. The deterioration occurs principally on clayey soils.

On the inundation canals of the Mooltan Division and of the Shahpur District no deterioration has yet been caused by irrigation.

Unirrigated Lands.—There is no evidence of general deterioration of soil. A greater proportion of inferior land can now be cultivated with profit than was formerly the case, and so the average yield of land reckoned on the total area cultivated is probably lower than it was. The old wastes which have been brought under cultivation from time to time since annexation do not yield now so richly as when first broken up, and land generally gets fewer rests than it used to do. Also neither the population nor their cattle have increased in the same proportion as the extension of cultivation. All these causes tend to lower the average yield of cultivated land. But there is no evidence that the natural powers of the soil are becoming exhausted; or that the yield of the crops cultivated have decreased out of proportion to the greater frequency with which the land is cropped. In tracts where the rainfall is small and uncertain the consequent occasional failure of crops dependent solely thereon acts as a natural protection against over-cropping.

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North-Western Provinces and Oudh.

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1. In this reply a brief attempt will be made to show what has been actually accomplished up till now in the direction of improving the existing staples of the country or the system of cultivation, or of introducing new staples.

2. The staples to which the special attention of the North-Western Provinces Government has been drawn are—tea, rhea, cinchona, tobacco, silk, cotton, and sugar.

3. *Tea.*—The introduction of this most important staple into Upper India, and thence to other parts of the Peninsula, is one of the most remarkable successes in an agricultural direction which the Indian Government has achieved. The first serious attempt was taken in hand not much more than 40 years ago by Drs. Wallich and Falconer, superintendents of the Botanical Gardens at Saharunpur, in the North-Western Provinces, in pursuance of measures instigated under Lord Bentinck. Gardens were established at different elevations in the Himalayas and in the Dun, where the experiment of naturalizing the China tree was tried; the cost of these experiments, which included the importation of several Chinamen, and the struggle with the initial failures and disappointments that rendered success for some years doubtful, and would probably have broken the spirit and fortune of any individual pioneer, were borne by Government until at a period which may be roughly given as five and twenty years ago, the new industry had established its ability to stand alone. Then the Government tea plantations were sold, and the extension of the industry was left to private enterprise, which quickly carried it to the more prolific regions of Eastern Bengal. The tea of the North-Western Provinces is now bought chiefly by native traders from Cabul and Central Asia, but it must always be recognized that this was the pioneering province which laid, after many troublesome struggles, the first stone of the important export trade which at the present time is so firmly established.

4. *Rhea.*—The object here is not so much to grow this plant, but to discover the best method of preparing its fibre for use. A small reward of 500*l.* was offered for the invention of suitable machinery, but as it did not succeed in attracting anything completely satisfactory, a larger reward of 5,000*l.* has been advertised, and several competitors from different parts of the world have now entered machines. The competition will take place in the autumn of 1879; meanwhile rhea plants have been grown in abundance in the Saharunpur Gardens and in Dehra, and specimens are shown in the Saharunpur Museum of the fibre that can be produced from it, and the uses to which that fibre can be put.

5. *Cinchona.*—Attempts have been made in this province to grow the tree in every likely altitude and temperature, but in vain. The dry heat of the plains and the frost of the hills are equally fatal to it, and even in the warmest and most protected Himalayan valleys, the plants, after growing promisingly for two or three years, were cut down by a night's frost.

6. *Tobacco.*—On this subject Mr. Buck writes as follows:—

"An experiment in tobacco cultivation was set on foot at Ghazipur, under the Department of Agriculture in 1875–76.

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* 1. Circular Government of India, Department Public Works No. 23, dated 24th March 1869, and proceedings Punjab Government, dated 26th April 1869, being papers forwarding for analysis specimen soils from Western Jumna Canal with analyst's report.

2. Selections from records Financial Commissioner Punjab No. 15 (1874) concerning reclamation of reh land (which includes Doctor Brown's opinion).

3. Proceedings Punjab Government December 1873, containing a report on reh efflorescence by Civil Surgeon of Karnál.

4. Report of Settlement Officer Karnál, June 1877, on re-assessment of Tahsíl Pánipat, paras. 111 to 124.

"The Government of India,* having removed the horse-breeding stud from that station, and desired that some portion of it might be devoted to the purposes of a model farm, Sir John Strachey sanctioned the proposal to enter into arrangements with the firm of Messrs. Begg and Sutherland (of Calcutta and Cawnpur), to utilize the stud lands as an experimental tobacco farm. The terms which have been made are these: about 1,200 acres have been rented for five years at Rs. 5,000 (about half assets rates) to the firm, who have been allowed a rent-free use of the stud buildings as curing-houses, &c., on condition of their importing from Virginia a carefully selected tobacco curer, and placing a certain acreage each year under tobacco, and of acting under the general superintendence of the director, at whose disposal all information acquired and all the results of their experience are to be placed.

"The curer, to whom the firm of Messrs. Begg and Sutherland pay 300*l.* a year, arrived in January 1876, just before the cutting season for that year commenced. He was carefully selected by the tobacco exporting firm of Messrs. Campbell & Co., and is well skilled in all branches of tobacco preparation and manufacture. The tobacco was, most of it, raised from imported Virginia seed, and although said to have been badly cultivated, received a favourable opinion from the Virginia curer, who cured a sufficient quantity to send as samples for opinion and valuation to the English and Australian markets, in the former of which it has been classed at a price which is sufficiently high to encourage further efforts, and which raises the value of the produce of one acre from 3*l.* or 4*l.* to 10*l.* or 15*l.*"

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"In 1876–77 a crop had been raised from 52½ acres at Ghazipur; a severe hailstorm reduced the value of the crops, according to the firm's estimate, by fully one-third. The out-turn was nearly 59,000 lbs., exclusive of second cuttings retained by cultivators, but was not sent to England on account of its being so much broken by hail."

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"The ensuing drought, which was extreme at Ghazipur in 1877, prevented the growth of anything like a good crop at that farm; but the firm had, in anticipation of obtaining Pusa, secured a second professional curer and manufacturer from America (Mr. Cabaniss), who arrived in time to raise an excellent crop on 200 acres at Pusa, a result which justified my conclusions previously placed before Government, as to the greater suitability of the Upper Bengal climate for tobacco. At Ghazipur, however, there was as much difficulty experienced in keeping the crop alive as the curer, and on 60 acres the out-turn was only 50,000 lbs. of an inferior quality.

"The Pusa crop on 200 acres realised an out-turn of more than 150,000 lbs., of which 15,000 lbs. have been sent to England, and valued at prices varying from 2½*d.* to 5½*d.*, but the brokers say that it would have fetched more if it had been kept longer in this country to mature. Of the remainder a large quantity will be manufactured, and a portion sent to England as cured leaf."

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"The results of the operations hitherto undertaken are still uncertain. The firm are sanguine, and I am sanguine, as to ultimate success, but time is still wanted. A crop sown in July 1877 is cut in January, cured by March, sent home in the rains, kept in bond for a year (two are better), and opened for sale in 1879. Of all the tobacco sent home only the small parcels of 1876 (which were the produce of a crop injured by hail and grown in a dry season) have been tested in the market. They realized a price three times as great as Indian leaf previously exported, and about two-thirds the price of American leaf of the same class. The smoking mixtures prepared for European use in India are becoming very popular.

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"A comparison of tobacco with tea may give some idea of the possible position which the former may take as a product of India. An acre of tea produces in Eastern Bengal about 300 lbs. on the average; three or four years elapse before it begins to yield, and full vigour only lasts for a few years without expensive manuring. Cost of cultivation and manufacture is given at various rates, but there is reason to believe that, including export, it is not less than four annas a pound. The average price, good leaf and bad, is said not to exceed nine annas a pound. At these rates net profits on 100 acres would be 300 × 5 annas × 100 = Rs. 9,375. An acre of tobacco produces about 800 lbs. on the average; cost of cultivation and curing can, including export, be kept probably to two annas, and if manufacture is added to three annas. The price of cured leaf ought to be, if it is to compete with American tobacco, 6*d.* a pound, or four annas, and of manufactured tobacco in India about 10 annas. The minimum net profits of 100 acres at these rates are 800 × 2 annas × 100 = Rs. 10,000 for cured tobacco, and Rs. 800 × 6 × 100 = Rs. 30,000 for manufactured leaf.

"The above figures show that there is as good, if not a better, margin for profit in tobacco than in tea. The market in which it competes is of larger extent, and it is almost proved that tobacco cured in India can be sold in London at a profit for a price at which it would not pay America to send it."

7. *Silk.*—The mulberry tree, of which the delicate leaved varieties cannot live under the fiercely heated western blasts of summer in the plains, thrives in the mild climate of the Dun; and this fact suggested the possibility of planting a silk-growing industry there. The place has the further advantage that the eggs can easily be sent up to be kept in the cold climate of the higher hills, and brought down by relays to be hatched as required, thus enabling strong worms to be produced at the most favourable seasons, and avoiding the deterioration suffered in Eastern Bengal by constant hatching in warm months. The experiment is still in its infancy, but if it succeeds the intention is to naturalise it among the people, so as to give them remunerative employment at their homes in leisure hours in rearing the silkworms. Mr. Buck says:—

"The silk farm is under the personal charge of Mr. Ross, Superintendent of the Dún, who in the year 1877–78 brought operations through to a third season. The second season was a failure owing to Mr. Ross's absence, but in this year he made some progress. The annual report states that 'the practical points of success were the health of the acclimatized worms and the large weight of good silk produced from good cocoons.' Which facts taken together prove that good silk can be successfully produced in the Dún. Professional opinion on the silk has not yet been received, but it is understood that a Calcutta firm is so well satisfied with the prospects offered that they have undertaken to establish a filature near Dehra."

8. *Cotton.*—In the beginning of the century, when the Company were merchants as well as rulers, large cotton farms were established in Bundelcund at Kalpi and Banda, both to improve the growth of the staple and to buy it up and send to Calcutta. This was before the American cotton had begun to take possession of the market. But the records relating to these early commercial enterprises have almost entirely disappeared.

9. *Cotton Farms.*—Cotton, however, revived again during and after the American war, 1862–65, and then the same impulse from Lord Mayo in the direction of agricultural improvement (1871) which created the Department of Revenue, Agriculture, and Commerce of the Government of India, led to the establishment of three farms in the North-Western Provinces, which were indifferently called Cotton, Model, and Experimental farms; and as at this time

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* Annual Administration Report of Department of Agriculture and Commerce, North-Western Provinces and Oudh, for 1877–78.

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the operations of the cotton department in the Central Provinces and Berar were being curtailed, several men who had been brought out to serve under it were employed as superintendents of these farms. Unfortunately, they were gardeners and not farmers, and failed to improve decisively the indigenous cotton which was the first operation entrusted to them.

Experiments have, however, been revived under the Provincial Agricultural Department. It had been proved perhaps conclusively that the finer fibres of American and tropical staples could not be obtained in the drier and more temperate climate of Upper India, but that it might be possible to produce a better indigenous cotton of a staple, too short and rough it is true for exportation to England, but sufficiently good for the coarser gins and looms of Indian mills. This is the object to the attainment of which, by selection of indigenous seed and improved treatment, experiments are now being directed. It will for the future be an object to avoid the long fine staples which are useless to the coarse machinery of Indian mills.

10. *Sugar.*—Has not perhaps received the attention which the importance of the product deserves. The sugar of Upper Bengal and the N.W. Provinces, known in the trade as Benares sugar, was at one time imported to England in much larger quantities, but at the present time the exports are insignificant. It quickly lost any place which it might have had in the estimation of home manufacturers by its low character and admixture with pithy fibre, and it is only used now for brewing and other inferior uses, having been abandoned even in the dyeing trade on account of its fibrous admixture.

11. Attempts were made in the early days of the East India Company to promote the industry in Upper India. Very large advances were given for sugar growing, and the factors in charge of districts in the neighbourhood of Benares, introduced sugar mills which (as Sir H. M. Elliot mentions) were found to be much less effective than the rude sugar mill of the country. As in the case of cotton, records of these early enterprises have almost disappeared, but the still existing ruins of sugar mills testify to many a complete failure and many a broken fortune. The chief mistake appears to have been the concentration of operations in large central establishments which led to the deterioration and evaporation of cane juice during the carriage of canes to the factory, for it is now well known that juice ought to be expressed and boiled as soon as possible after canes are cut.

12. The efforts of the Director of the Agricultural Department are now being directed to the improvement of the small local mills, and the native system of boiling and preparing sugar in the rude furnaces erected near the cane fields, in other words, attempts are now being made to work up from below instead of (as formerly) from above. The native mill, a sort of pestle and mortar on a large scale, effective as it is in expressing a maximum amount of juice, tears the coat of the cane to shreads and produces the fibrous admixture complained of in England, while the system which it compels of chopping the canes into small pieces leads to exposure of the juice to air and chemical deterioration. On the other hand, the prevailing methods of boiling and preparation do not follow the principles required for successful granulation of the good sugar. These defects are now the subject of special investigation by the local Agricultural Department which has invited the further assistance of European planters in providing remedies. The successful lead given by Messrs. Thomson and Mylne in the invention of a portable mill by which canes can be crushed uncut is noticed elsewhere. The mills are being rapidly introduced in the North-Western Provinces.

13. *Farms.*—The cotton farms established in consequence of the American war have been noticed above in paragraph 9. They were established primarily for cotton culture, but developed subsequently into institutions of a more general character. They were situated at Bulandshahr, Allahabad, and Cawnpore. Being as explained under superintendents whose education had been too purely horticultural, they never succeeded in showing any progress in an agricultural direction. Three years ago the Cawnpore man being wanted at Calcutta, Government decided to close the Bulandshahr Farm from which no results had ever been obtained. There are now two farms, viz., at Allahabad and at Cawnpore. The latter being placed under the management of a European planter of experience.

14. *Farms now maintained.*—The Allahabad Farm is in an unsuitable position to be used either for experiments or as a model farm, since it is situated in the rich moist land of the old bed of the Ganges, and its conditions are altogether abnormal. It was decided, therefore, only to keep a small area of less than 50 acres under Government charge, and to rent the remainder (about 100 acres), in order to test the value of the English ploughing and manure with which the land had been treated for six years. The superintendent is now required to supervise and keep a scientific record of operations connected with a newly established sewage farm, *i.e.*, a farm on which the street and latrine refuse of Allahabad are agriculturally utilized. An experiment (of measured value) has been brought into working order on a large scale, which will help to decide for all large towns in India whether the agricultural method of utilizing city refuse is or is not remunerative.

15. It is sufficient in this place to indicate that land manured with latrine poudrette or night-soil brings, without irrigation, about Rs. 20 an acre, and with irrigation about Rs. 40 an acre, more than the ordinary rent on leases of not less than five years. It is worth mentioning that at Cawnpore some land (where canal water and latrine manure are unlimited in supply) has lately let at more than 20*l.* an acre. The enhancement of income which is estimated for the city of Allahabad, when the system is completed, is Rs. 10,000.

16. At the Cawnpore Farm experiments have been made in introducing new seed—wheat from England, cotton from Central India, Carolina rice, Otaheite sugar-cane, &c., but none of these have had any success; and the chief use to which the farm is at present put is as a field in which to make experiments on machinery, chiefly ploughs, winnowing machines, and water lifts. The Cawnpore Farm is intended to take in future a more prominent position as the one experimental farm of the province and has been now established as the head-quarter of the Director of the Agricultural Department.

17. On this subject Mr. Buck writes:—"This is hardly the place for a dissertation on the difficulties in detail of grappling with Indian agriculture, but it is impossible to explain or to justify the course which has been adopted in this province without some remarks on the subject, which will, however, be made as brief as possible.

18. "In the first place, we have to deal with a climate and with conditions of soil completely at variance with those of England. The most skilled English agriculturists ought, therefore, to have the greatest diffidence in proposing any change founded on English experience, in a system of cultivation which has been evolved by centuries of 'natural selection.'

19. "The chief objections to English machinery (the word is intended to include 'implements') are —first, the price, utterly and completely out of the reach of the mass of Indian cultivators; the second is the cheapness of labour with which machinery has to compete; and the third is their unsuitability to Indian conditions.

20. "We have therefore to begin—firstly, by reducing the cost of construction of machines; secondly, by limiting our machines to those which will increase the effect of available labour rather than economise or provide a substitute for labour; thirdly, by modifying the machines until they are suitable for Indian conditions; it follows that until these objects are effected, we cannot, so far as machines are concerned,

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come forward to advise natives to adopt any class of machines, or to attempt to instruct them in their use.

21. "The second point noticed requires illustration by a practical example. A well bucket (A.) has been invented which is drawn by *one* bullock and *one* man, the ordinary bucket in use (B.) is drawn by *two* bullocks and *two* men; B. raises less than double the water raised by A. But A., though it economises labour, does not increase the effect of existing labour. B. gets more out of existing labour than A., the number of wells remaining the same. For this reason cultivators prefer B. to A.

22. "If, then, the position assumed is accepted, that we must ascertain how machinery can be adapted to meet native conditions, before attempting to introduce them or instruct others in their use, then the first step is to choose the class of machines to be adopted, the second to adapt them, the third to introduce them. 'The machines (the term including, as explained, 'implements') first to be taken in hand are undoubtedly—(1) ploughs, (2) water lifts. A native wants a plough—

(1) which he can carry;
(2) which his cattle can pull;
(3) which can be repaired by native smiths;
(4) which is very cheap.

"Some trouble has been taken during the last two years at Cawnpore to provide such a plough, and all the required conditions are now fulfilled to a promising extent. The next step is to introduce it. This we are attempting on the Court of Wards estate, on the use of which estates remarks will be made further on. There are two modified ploughs now made at Cawnpore, one for Rs. 4, the other for Rs. 8 or 9; the first being less effective than the second but of lighter draught. The price is far lower than anything yet reached. Imported ploughs cost from Rs. 20 to Rs. 30 each. Already several cultivators have made *bonâ fide* purchases of the new ploughs.

23. "The next 'machine' is the water lift, with which we have not made so much progress. Our farm superintendents have been useless in giving any aid in this direction, and I have been helped far more by the American tobacco farmers at Ghazipur. I have referred to the modified hand lift, on the pattern of an Australian pump which I brought from Melbourne, in a note on wells under question 4, and the Famine Commission saw at Ghazipur the rough construction, which was the first attempt at a cheap modification. There is reason to believe that it can be made for Rs. 10. The Government workshops at Roorkee are now supplying the Cawnpore Farm with every kind of water lift which appears to have any chance of success, and works are under construction which will enable them to be tested and compared.

24. "The only instance in which I am aware of a new machine having been largely adopted by natives is that of the small sugar mill invented by Messrs. Mylne and Thomson. It is a significant fact that these gentlemen have taken some years to modify the machine to its present form, adding a little improvement year by year. The cultivators who have taken it are now numbered by thousands.

25. "This fact supplies three lessons: one, the necessity of patient application in the study of adaptation of machinery to Indian wants; the second, the desirability of appealing to a native verdict; the third, the absurdity of condemning all attempts at improvement as hopeless; the fact being that hitherto what few attempts have been made have been made on unsound principles. In other cases too it has been found that whatever the native cultivator ascertains on trial to be profitable he will adopt. The extension of indigo, potatoes, opium, and other new staples, some of which were opposed by religious prejudice are cases of older standing. Brahmins now grow indigo whose fathers would not have dared to touch the unclean plant."

26. *Botanical Gardens.*—Besides the farms there are two other institutions of older date—the Botanical Gardens at Saharanpur and at Lucknow. The former is under the charge of a scientific botanist, and the botanical collection of trees and shrubs is one of great value and is rapidly increasing. It is also used to grow vegetable seeds for distribution to soldiers, and to raise fruit and other trees for roadside avenues and gardens. The Lucknow Garden has chiefly been kept up for horticultural purposes, and the acclimatization of flower and vegetable seeds.

27. Mr. Buck writes:—"The farms which Government maintain cannot, as above noted, be termed model farms, partly because for one thing in which we can beat the native, he can beat us in a hundred, and partly because if the farm was cultivated on Government account, peculation and dishonest labour would destroy the value of every result. As it is, native dishonesty goes far to impair the value of experimental cultivation, but it would absolutely ruin any attempt at model farming. Every man employed to cut the crops, to thresh, winnow or store the grain, or to sow the seed, takes something of what passes through his hands, and thus prevents accuracy of measurement, while by shirking their work the cultivating labourers prevent accuracy of the record of cost. The only hope of ensuring true experiments is to adopt a system under which cultivators will carry them out on their own lands for their own benefit. This is now being commenced on Court of Wards estates.

28. "I do not think this province is yet ripe for the establishment of a training establishment. We have too little to teach and too much to learn. When we have discovered what plough to use, what water lift to adopt, what staples to recommend, what system of cultivation is better than the native system (hard, I suspect, to beat), then we ought to train men to carry our improvements through the country. I do not mean that nothing would be gained by an education in knowledge of agricultural facts, but that at present an attempt at education in practical farming would be too little productive of results. What we require at the present stage is the application of scientific inquiry in the two directions which I have indicated —machinery and soils.

29. "Court of Wards estates have hitherto been utilized in a desultory and useless way. Ploughs, sugar mills, and seed have been sent out to them, but there has been no intelligent supervision available to see that they were properly and persistently tried, and the alarming drought has also interfered with arrangements projected by Sir George Couper. But the Government has now taken practical steps to place Court of Wards experiments on a better footing. One large estate has been placed under a covenanted civilian, who is required to carry out the programme laid down by Sir John Strachey in the most complete way; and the Board of Revenue have issued instructions for special operations in some other estates in communication with the Agricultural Department.

30. "One of the points still unnoticed is agricultural exhibitions. There is one agricultural meeting which Mr. Willock, the former collector of Bulandshahr, promoted at that place, and which is annually held at the expense of the landholders of the district. It is very successful in bringing the people together and giving them an opportunity of seeing good cattle and produce and discussing improvements. The natives themselves have annually exhibited and receive prizes for good seed, but the good seed has always been taken home again by the exhibitor, and I doubt if any practical result has been obtained. But the establishment of a meeting of the kind, which has become really popular with the natives, and is kept up without any official interference from outside the district, is in itself a very great result indeed, and may prove to be the germ of real improvement on a large scale in the north of India. Measures are being taken to interest the talukdars in the institution of a *bonâ fide* agricultural exhibition annually at Lucknow."

31. Although many private persons, especially indigo planters, have introduced machinery on their estates and tried to improve the system of agriculture there is nothing to relate in the way of practical successful results, and the native cultivators have in no case followed their example.*

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* See Gorakhpur Report for an account of Mr. Bridgman's estate.

BENGAL.

The first movement towards the improvement of agriculture by means of the establishment of model farms in Bengal was made in 1856, when the propriety of making agricultural instruction a part of the curriculum of the Ooterparah school, and raising the school to the status of a collegiate institution, was brought before the Government of Bengal by Babu Joykissen Mookerjee, the well-known zamindar of Ooterparah. Nothing was done however; but in 1867 the question was revived by him, with a proposal that Government should establish a model farm, in connection with the same institution, for imparting practical instruction in agriculture, and the project was supported by a memorial from Babu Hurry Mohun Mookerjee, an assistant in the Botanical Gardens. The proposal to raise the school to the status of a collegiate institution having been negatived by the Educational Department, the subject was again postponed, and the only step since taken towards teaching agriculture in Bengal was the opening of a chair in the Calcutta Normal School for giving lectures on the subject.

In 1871 the Government of India, in the Agricultural Department, circulated Mr. Secretary Hume's note on agricultural reform and model farms, and the district officers of Bengal and several other gentlemen, European and Native, were asked to report on Mr. Hume's scheme. Many valuable opinions were received by Government in reply to the call, the opening of similar farms on estates under the Court of Wards and on Government estates being discussed at the same time.

These reports were finally submitted to the Government of India (in Mr. Secretary Bernard's letter No. 2076½, dated 31st July 1872), with a proposal to establish, with the aid of the Government of India, the following farms:—

(1.) A set of small irrigational farms in Kuttack, on the plan proposed by the Commissioner of the Orissa Division.

(2.) A model farm of not more than 100 acres in the Midnapur District, on a canal, with small attached ryots' farms under supervision.

(3.) A very moderate sized farm on the Sone Canal, in the Shahabad District, with attached ryots' farms under supervision.

(4.) An experimental Government farm in the Khasi Hills in Shillong.

(5.) Model villages in Khas and Wards estates, at the expense of the estate.

The estimated cost of establishing these farms respectively was as follows:—

No. 1.—Kuttack Farms.

	Rs.
Allowances to canal officer for five years - - - - -	6,000
Thirty 10-acre farms at Rs. 2-8 for rent and water, and Rs. 1-8 for seed and contingencies - - - - -	6,000
Allowance for 50-acre farm at head-quarters, at Rs. 5 per acre, for five years - - - - - -	1,250
Total - -	13,250

Nos. 2 and 3.—Midnapur and Shahabad Farms.

	Rs.
Two superintendents for five years -	50,000
Rent at Rs. 10 for three years, and Rs. 5 for two years, on 100 acres - -	4,000
Contingent allowance for stock, fencing, &c., at Rs. 30 per acre - -	3,000
Thirty 10-acre farms as in Kuttack -	6,000
Total - -	63,000

No. 4.—Shillong, Khasi Hills.

Superintendent as above - -	25,000
Contingent allowance for stock, sheep, &c., at Rs. 1,000 per annum - - -	5,000
Other contingencies of farm for first three years, land free - - - -	1,500
Total - -	31,500
Grand total for the four farms -	1,07,750

The following is a brief account of the several farms thus established in Bengal:—

Shillong Farm.—After some delay a superintendent for the Shillong Farm was obtained from Lahore, in the person of Mr. Freeman, who was appointed to undertake its charge towards the close of 1873 on a salary of Rs. 300 a month. Mr. Freeman proceeded to Shillong in the beginning of 1874, and a grant of Rs. 1,000 was placed at his disposal for commencing operations on the farm.

For the tree nursery, which it was thought desirable to establish in connection with this farm, a tract of land covering an area of about 1,500 acres was taken up in 1872–73 close to the station, and Scotch fir, silver fir, larch and ash seeds from the Botanical Gardens, Calcutta, were put into the ground, but unfortunately none of them germinated. A supply of Australian seeds was also tried. For the orchard, a plot of ground covering two acres, planted with English fruit trees by Major Pollock, was acquired for Government, containing a number of healthy, thriving trees, such as apples, pears, apricots, peaches, olive, and several of the trees were bearing fruit in 1873. The entire enterprise has now been surrendered to the administration of Assam.

Midnapore Farm.—The proposed farm at Midnapur did not get beyond the stage of correspondence, although a proposal had been submitted in 1872 to start a farm of 300 bighas in mouzah Radhakisore. The soil was found to be very poor, and the project was abandoned. The opening of a farm on a smaller scale on the Government estate, Cantonment Mehal, at the sudder station of Midnapur, for agricultural operations and the breeding of cattle and poultry, was also proposed and approved in 1872–73, and sanction was accorded to an expenditure of Rs. 2,000 for buildings and the purchase of cattle, &c.; but no one qualified to undertake the charge of the farm could be obtained, and the project had to be abandoned after a small expenditure of Rs. 25.

Shahabad Farm (Arrah).—The farm projected in the Shahabad District was finally opened at Arrah in April 1873, under the superintendence of Mr. Gleeson, a European gardener from Allahabad, previously in charge of the cotton experiments there. Mr. Gleeson was deputed to take charge of the farm, with a view to his combining the experimental cultivation of the poppy seed, with the operations of the model farm.

The area of the farm was about 50 acres, on Government land, close to the railway and the canal. Mr. Gleeson was allowed one cultivator, one chaukidar, and one chupprassee as servants on the farm, the

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general work being performed by hired labour; and the farm was under the general supervision of the superintending engineer, Mr. Levinge, subject to the orders of the Board of Revenue. The total amount expended up to the end of 1874–75 on account of the farm was as follows:—

	Rs.	A.	P.
Initial outlay in buildings, &c. -	8,307	0	11
Ditto in purchase of stock -	1,028	10	6
Salaries of superintendent and monthly establishment - -	4,292	4	7
Working expenses—wages of labour - - - -	3,641	10	9
Total - -	17,269	10	9

Experiments were made with Carolina rice, cotton, flax, and opium. The Carolina rice seed failed absolutely; the flax also; all the water available on the farm being required for the poppy. An experiment with Hinghunghat cotton was fairly successful, the two acres of land sown therewith yielding 797 lbs. of uncleaned cotton in spite of the drought. The experiments with poppy were not so varied as could have been wished, and the unusual character of the season deprived them of any real value. The receipts from sale of produce of the farm amounted from the opening to May 1875 to Rs. 722–6–0.

On the 20th March 1875 the Commissioner of the Patna Division reported to Government that the disbursements on account of the Arrah Farm, up to the end of July 1873, exceeded the receipts by Rs. 11,139–1–3, and the Lieutenant-Governor considered it advisable to approve of the Commissioner's recommendation and close the farm. Orders were given to dispose of the lands, buildings, and farm stock, and credit the proceeds of the sale to Government.

Kuttack Farm.—With reference to Kuttack, the project contemplated the establishment of a 50-acre farm at head-quarters, and thirty 10-acre ryotee farms on the canals. The design was somewhat modified in execution. Twenty ryotee farms were started in 1873 by order of Sir George Campbell, under the supervision of the canal authorities: and one of the objects was to institute a comparison between the returns from irrigated and from unirrigated areas. The report for 1873–74 shows that in that year there were 10 farms; but in the year 1874–75 only five were kept up, the ryots apparently showing no readiness to do what was wanted of them, though very liberal terms were offered.

It may safely be concluded from the figures given in the report that a ryot who gets canal water gratis, and has manure and seed supplied to him by Government, will generally get a larger gross crop off his land than the ryot who does not irrigate his fields, and who uses manure very scantily. It was probably anticipated, when the experiments were commenced, that some conclusion not altogether so obvious as this would be arrived at; but there is nothing to justify any inference as to the comparative net profits of the two systems.

Even the difference in the gross yield is scarcely so much as might have been looked for. On farm No. 1 the average yield was 19 maunds per acre: on similar, but unirrigated lands, it was 16 maunds 8 seers. On farm No. 3 it was 20 maunds 13 seers, while 17¼ maunds were yielded by unirrigated lands. As, however, the report does not show whether the season was one in which irrigation was of great importance, it is difficult to draw any deduction from these figures. But, on the whole, it would seem probable that the difference between the gross yield on the two classes of land would be swallowed up by the larger expenses of cultivation on the model farms.

The whole cost for 1874–75 was Rs. 436, and the Commissioner asked for permission to spend up to Rs. 1,000 during the following year. But the Lieutenant-Governor was reluctantly compelled to come to the conclusion that the benefit derived from these experiments was not commensurate with the expenditure involved, and directed that the farms should be abandoned and no further outlay incurred.

Balasor Farms.—Forty-four small ryotee farms were opened at Santipore, under the superintendence of the Revd. J. Phillips, an American missionary, who was formerly a farmer in America, subject to the control of the collector of the district. The area cultivated in 1873 was 305 bighas—145 bighas by 15 Hindu, 33 bighas by 6 Sonthal, and 127 bighas by 23 native Christian ryots. The ryots were found intractable, and the experiment was a failure. The cultivation was mainly confined to indigenous paddy, the main object of the experiment being to convince the people of the advantage of freely using the canal water. The small quantity of Carolina rice sown failed to yield a return, and an experimental sowing of oats only was moderately successful. The total expenditure in these small farms was Rs. 1,910, and the receipt from sale of produce was estimated at Rs. 1,824. The ryots took no interest in the matter, and their inveterate prejudices and superstitions contributed largely towards the ill-success of the experiments, and the small farms have accordingly been abandoned. Mr. Phillips himself opened a small farm of three acres, with the services of a mali or gardener on Rs. 7 a month. Two excellent varieties of sweet potatoes were successfully introduced by him, seeds of which were supplied gratis to the agriculturists for cultivation. A grant of Rs. 250 was made to the Revd. Mr. Phillips for the year 1874–75 to carry on his experiments, but as the results did not prove to be of any benefit the Lieutenant-Governor stopped the grant.

Baraset Farm.—About 150 bighas of Government estate land being found available at the sudder station of the Baraset Sub-division, a small farm was opened thereon in May 1873, under the supervision of Mr. Porter, the then sub-divisional officer, who took a great interest in the matter. Sanction was accorded to an outlay of Rs. 800, in addition to a sum of Rs. 133–15, the accumulation of the school garden fund transferred to the farm, and also to a special grant of Rs. 26 a month. One-fifth of the area of the farm, or 30 bighas, was let out for experimental cultivation to ryots for a term of two and a half years, who were to receive half the produce, and be supplied with seed in addition to the land, while they supplied labour, &c. Convict labour was also employed on this farm, and as it had some good grazing ground it was proposed that it should be tried for the improvement of stock. The native superintendent who was engaged turned out to be a mere botanist, and not a practical agriculturist at all, and his services were dispensed with. A cultivator was subsequently employed on Rs. 10 a month, and the operations consisted of experimental sowings of jute, Carolina paddy, flax, Sikhim dry rice, tobacco, oats, and *sorghum saccaratum.* The reports received of the various crops reaped showed anything but satisfactory results, the character of the season having greatly militated against the success of the experiments. The total expenditure on this farm up to the end of the year 1874–75 amounted to Rs. 1,715–4–6, while the receipts were but Rs. 136–6–9.

The reports received from local officers showed clearly the uselessness of continuing this farm under the existing system. The only useful result that was produced was the planting out of some trees, and these, especially the teak and mahogany saplings, are certainly worth looking after. The Lieutenant-Governor ordered the farm to be closed in September 1875, and orders were issued to sell the plough bullocks belonging to the farm. The sub-divisional officer was instructed to see that the trees were taken care of.

Berhampore Farm.—A farm of about 300 bighas of land was projected on the Gorabazar Government estate, close to the sudder station of Berhampore, of which 200 bighas were leased out to ryots, the rest to be managed khas; and Rs. 500 were sanctioned for initial expenses. A proposal to take up the Moti Jhil Garden, belonging to the Nawab Nazim of

Murshidabad, was made, but after consideration abandoned. With the exception of levelling and clearing the jungle at an expenditure of Rs. 35–7–6 only, nothing was done on this farm for want of a person to superintend it.

Dacca Jute Farm.—The establishment of this farm of 80 bighas of land chiefly for the cultivation of jute from varieties of seed, as well as other crops, was sanctioned in February 1873, and a grant of Rs. 1,000 made for initial expenses, with Rs. 3,336 per annum for working the farm. Fifty-four bighas were brought under cultivation during the season, under the superintendence of Mr. Monier, viz., under jute, 48 bighas; under cotton, three bighas; under Carolina paddy, three bighas. The season was very unfavourable, and operations were commenced late. A superintendent was appointed on Rs. 600 a year. The first and third sowings of jute were successful, but the second sowings failed. Cotton and Carolina paddy were to some extent successful. The acclimatized American cotton produced the finest plants the collector had ever seen in the district. The jute also, from seed from Rangpur, was pronounced to be very fine. The total sum expended on the farm for pay of the establishment and hired labour, purchase of implements, plough cattle, manure, and seeds, and the preparation of sheds and feeding the cattle, amounted to Rs. 5,261–4–9; whereas the receipts from sale of produce amounted only to Rs. 1,268–12. The farm was, under the Lieutenant-Governor's orders, closed in March 1875.

Jamalpur Farm (*Mymensingh*).—Great difficulty was experienced in obtaining land in this district for experimental cultivation, but a farm was at last begun on Government estate "Line Jamalpur," and 200 bighas of land granted rent free to substantial ryots for a period of five years under the following conditions:—The lessees engaged to settle resident ryots on the land; they were to cultivate the lands at their own cost under Government direction, the seed to be supplied them gratis, and the produce to be their own. The total rental of the estate (700 bighas) was Rs. 666, of which Rs. 207–3 were abated on account of the area allowed rent free. The arrangement was sanctioned for one year only. The farm consisted in all of 277 acres, and experiments were made with Carolina paddy, Sea Island cotton, safflower, tobacco, and mustard. The cultivation failed in every instance but that of safflower, and in that case also the crop was lost through the neglect or inexperience of the manufacturers. The lessees then tired of their bargain, and Government, at their request, cancelled the agreement. The total cost of the experiment was Rs. 257–1–3.

Jail and Public Gardens.—In addition to these experiments, some attempts were made upon a smaller scale in the jail and public gardens of the Presidency Division for improving the growth of cotton, &c. An experimental poppy garden was also started at the Mitapur Jail, in the Patna Division, and another on land belonging to the old Digah Jail, under the management of Mr. Scott. None of these experiments gave any satisfactory or tangible results.

Poosah Farm.—The Poosah estate is a Government khas mehal, consists of two blocks of land in the Darbhanga District, one on each side of the Chota Gandak River. The plot on the north of the river containing 3,720 local bighas is held by the Government under a mokararie lease at a fixed rental of Rs, 1,499, and the southern portion, measuring 1,467 bighas, on which the Government Stud Depôt was formerly located, is similarly held at a rental of Rs. 2,138. When the Stud Depôt was closed the Government of India contemplated the sale of the entire estate; but on the Lieutenant-Governor's representation it was made over to this Government, as the place was described as well adapted for the trial of agricultural experiment. It was determined that the plot on the north of the river should be settled with the ryots for ten years after the necessary measurement and survey, and a model farm was established in 1874 on the southern plot, under the superintendence of Mr. Paterson, who was specially appointed for the duty on a salary of Rs. 200 a month.

Various experiments have been made on the farm in the cultivation of the ordinary grains of the country, but, generally speaking, without much success. Experience seems to have proved that the farm will not be of service as a means of improving the cultivation of the ordinary country grains, or of diffusing useful agricultural knowledge. The growth of tobacco has also been tried, as it was believed that the cultivation of this staple, under proper management would add to the welfare of the country. Experiments were made on the farm under the supervision of Dr. E. Brown in the manufacture and curing of tobacco on the Manilla process; but the results, though they have furnished some useful knowledge of the subject, have been financially a failure, and the produce of the tobacco is said to be of no value in the European market. This farm has since been leased to a private company for the cultivation of tobacco.

These details show how various experiments have been unsuccessfully made in the cultivation of the ordinary grains of the country, which the people of the country grew much better and more profitably than the managers of the Government model farms. It has been proved by experience that none of the farms were of any service as a means of improving the cultivation of the ordinary country grains, or of diffusing useful agricultural knowledge. The attempt to teach the people to cultivate their lands cheaply and profitably, and to make the best use of the materials which are under the most favourable circumstances ever likely to be available to them failed everywhere. Indeed it is pretty clear that the people know a great deal better how to make the most of the land with such means as could ever be made generally available to the petty cultivating class, than any of those who have yet attempted to teach them. Any further attempts at experimental farming and instruction of ryots are much to be deprecated.

Improvement of Breed of Cattle.—There is no record of any systematic attempt having been made in Bengal, either by State or by private enterprise, to improve the breed of cattle. Improved breeding indeed is of little use without improved feeding; and as the area of cultivation extends year by year, and that of forest grazing and waste land recedes, the indigenous breeds of cattle tend perhaps rather to deteriorate than to improve.

Mr. William Tayler, when commissioner of Patna, and Captain Johnstone, when in charge of the Keonjhar estate, tried the effect of improved breeding by putting imported bulls to country cows. The result was certainly a superior breed, but the means employed, and the food required to keep up the improvement, are beyond the means of every cultivator in the province.

The ordinary cattle of the country are admirably adapted by nature to its wants, and a sufficient supply of food is all that is required to enable them to do the work required of them and to prevent their deterioration. If larger cattle were successfully bred they would die of starvation, and would be no more useful even if they lived, than the ordinary cattle of the country.

Agricultural Implements.—As regards ploughs and other agricultural implements, those now in use are what have been in use for generations previous to our occupation of the country. The faculty of invention and improvement is one quite unknown to the stolid conservatism of the Bengal ryot. Probably experience has shown him that the simple implements which he can construct himself with the material growing at his door are all that he requires so long as they perform the work which he wants them to perform. Bengali agricultural implements, as now fashioned, are well adapted to the work to which they are put. A deep furrow in alluvial soil would often sacrifice all the good earth deposited by flood and bring up sand in its place. All attempts to introduce

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European models have naturally failed, for even if they be granted to be superior, they are beyond the means of the masses, though they might be used by rich zemindars and others as playthings. It is of little use to demonstrate to the cultivator of a 4-acre farm, on which he produces probably three or four different crops, the efficiency and rapidity with which a steam plough works up a 20-acre field. A man who has to think twice before spending a few rupees on a new plough or cart is not likely to invest money in the very best winnowing machine which can be invented. Only one improvement in agricultural implements is worthy of mention under this head, viz., the sugar mill patented by Messrs. Mylne and Thomson, of Beheea. This machine is the result of many years study and labour, and having been specially adapted in construction to the wants of the people, it has achieved in Behar quite a success. The custom there is for a village mahajan to buy one of these machines and let it out to the ryots, or for the cultivators to club together and buy one. The price (Rs. 80) puts it beyond the means of individual cultivators. When consideration is given to the ease with which the enormous population of Bengal is ordinarily supported, and the amount of surplus produce exported to other countries, it is sufficiently manifest that there is not much to be remedied in this system of cultivation.

Agricultural Exhibitions, Fairs, &c.—Agricultural exhibitions and fairs are held yearly in many parts of Bengal. They are partly religious gatherings, in which amusement plays a very much more leading part than instruction. Prizes are given for cattle and agricultural produce of all kinds, but the exhibitors are chiefly persons living quite near to the places where the fairs are held, and it cannot be said that any improvements in the modes of, or implements used in, agriculture have resulted from them. As bearing on the question of famine prevention, their results are absolutely nil. There is no exhibition of new tools, implements, and inventions, such as obtains at similar gatherings in Europe.

Deterioration of Soil.—There are no means of ascertaining, as regards this province, whether or not there has been any deterioration of soils. The pressure of the population on the land has compelled the people to take up for cultivation inferior lands which in former times were kept for grazing or jungles which once furnished supplies of firewood. Ample and timely rain seems to be all that Nature demands on ordinary lands as the condition of an abundant rice crop. In bad years the land gets a partial rest, without which it would perhaps rapidly deteriorate, and all conditions of Indian agriculture seem to turn on a compensation balance system which is admirably adapted by Nature to so poor a country. As regards the exhausting effects of irrigation, it is too soon to speak. The Orissa ryots have a popular belief that the continued irrigation and heavy cropping of soils to which nothing is given back in the shape of manure is deleterious, but no actual or scientific experiments have been made to test this belief. The question can perhaps be answered in the upper provinces, where irrigation is not, as in Bengal Proper, still more or less of a novelty.

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CENTRAL PROVINCES.

Before, and especially after the provincial exhibitions at Nagpur in 1865 and at Jabalpur in 1866, constant attention has been paid to the improvement of agriculture. A Cotton Commissioner was appointed in 1866, and till the abolition of his post in 1871 did good service. The matter of selection of seed has been adequately pressed on the people.

Some progress, but not proportionate to our efforts, has been, I think, secured. I cannot say how far this progress has been the result of our efforts. My only suggestion is that perhaps something might be done to improve the system of storing grain in Damoh, where it is now buried in pits, in a soil in which the water level during the monsoon rises almost flush with the ground and ordinarily damages some part of the grain, which, however, the poorer borrowers are compelled to receive, and, to the detriment of their health, to consume.

There is a Government model farm at Nagpur.

Estates under the management of the Government or of the Court of Wards are generally encumbered, and there is no room for trying experiments. Good management of its finances are primarily to be guaranteed and secured. When a surplus has been secured the administration has insisted on a portion being laid out in permanent improvements of the estate. It may be doubted whether experiments or speculative improvements in agriculture, except under such thoroughly safe supervision as cannot be provided, should be attempted at the expense or risk of the wards.

Cattle breeding, sheep breeding, and horse breeding improvements have been fairly and fully tried by direct efforts of Government, and have met with, at the best, very limited success. For bullocks, we have, considering their requirements, fairly good breeds in Nimar and the Nerbudda Valley, a mixture of the Gujerat and Malwa breeds. The Nagpur trotting bullock for endurance and speed is probably unrivalled. For agricultural purposes we have good breeding grounds in the Arvi Tahsíl of Wardha, in Kamarpani of Chhindwara, and Dongarthal of Nagpur. Chhattisgarh exports to the Bhandara rice field, but buffaloes are largely imported from Bundelkhand through Saugor, Damoh, and Jabalpur to the Eastern Plains.

It is not beyond question whether our "primitive" plough is not after all the best for our requirements and possibilities; at any rate no change has been made, though the people have been shown many sorts of "Walayati" ploughs and their performances.

In carts a great improvement has been rendered possible through the gradual but very marked improvement in our roads. The Madrassi "bandy," which with one pair of bullocks on fair roads will easily convey two-thirds of a ton, is on the high road to entirely supplant the Maharatta cart carrying only from 12 to 15 maunds. This especially applies to the Nagpur and Western Chhattisgarh traffic.

Sugar mills are what they have been from time immemorial. Skilful blacksmiths and carpenters who could repair more complicated machinery in time of need are but very seldom to be found in our villages.

In my answer to question 4 I have compared the working of Persian wheels, mostly used in Hoshangabad and Narsinghpur, with the ordinary method of raising well water.

Iron pumps have been tried, but the difficulty of getting repairs done appears to be at present insuperable.

Every opportunity of a large and business fair is utilised to establish an agricultural show. For instance, the annual fair at Ramtek has one permanent feature, it is an agricultural show for the stock of Seoni, Balaghat, Bhandara, and Nagpur. At Dewalwara, the Wardha, and Nagpur, the people challenge those of Berar to show better animals. Birman, on the Nerbudda, is the show place, at the time of the fair, for the agricultural stock of the Nerbudda Valley and the Saugor, Damoh, and Jabalpur districts.

Similarly, Singaji in Nimar, Ganiari in Bilaspur, Garhakotah in Saugor, Chhapara in Seoni, and Rajim in Raipur rank as important fairs and agricultural shows.

At present it is too early to assign results to these gatherings. A liberal scale of prizes is offered by the district officers, mostly provided from the district funds and provincial grants.

Deterioration of soil.—I offer the following evidence and opinions on this most important subject.

Last year old patels assured me that in Wardha they had never seen such crops within 50 years as were then growing.

Mr. Grant, C.S., the Settlement Officer of Narsinghpur, mentioned Captains Sleeman and Ouseley as authorities on the early condition of the Nerbudda Valley. A co-temporary of these officers, Mr. Wardlaw, of Seoni, wrote in 1831, and showed what the current belief of that day was. He writes:—

"With the view of showing the productiveness of the different description of soils in their several stages of being either fresh or been for some years under cultivation, or have become by long tillage in an exhausted state, I herewith subjoin tables exhibiting the number of returns of the several grains which each soil at different periods is supposed to yield."

NUMBER of Returns of each Description of Rabi Grain.

Soil.	Wheat.	Gram.	Massur.	Teorah.	Baterah.	Alsee.
1st kabar for the first 25 years	10	10	11	11	11	10
For the following 10 do.	7	7	8	10	10	10
Do. 10 do.	5	4	6	9	7	8
When the land becomes exhausted	3	—	4	8	5	—
2nd kabar for the first 25 years	8	8	9	10	10	10
For the following 10 do.	6	4	7	10	6	8
Do. 10 do.	4	—	6	8	4	6
When the land becomes exhausted	2	—	4	7	—	—
3rd kabar for the first 15 years	6	6	7	10	10	10
For the following 10 do.	5	3	6	8	6	8
Do. 10 do.	3	—	4	7	4	5
When the land becomes exhausted	2	—	3	6	—	—
1st murand for the first 20 years	6	6	7	10	10	10
For the next 10 years	4	—	6	8	6	8
When it becomes exhausted	2	—	4	6	—	—
2nd murand for the first 15 years	5	4	6	8	6	8
When it becomes exhausted	3	—	4	6	—	—
3rd murand for the first 5 years	3	3	4	5	5	6
When it becomes completely exhausted and requires a fallow of 3 years to recover.						

NUMBER of Returns of each Description of Khareef Grain.

Soil.	Rice.	Urad.	Tur.	Mung.	Tili.	Jagnee.	Kodo.	Kutki.	Jowar.
1st barrah for the first 5 years	10	12	50	10	100	20	30	20	100
For the following 2 years	—	—	—	—	—	15	—	15	—
When the land becomes completely exhausted requires a fallow of 4 years to recover.									
2nd barrah for the first 2 years	—	—	—	—	100	—	30	20	—
When the land becomes completely exhausted and requires a fallow of 4 years to recover.									

NUMBER of Returns of Grain in the Rice Districts of Kuttangi Karoulah.

Soil.	Rice.
Bundwas land for the first 10 years	16
For the next 40 years	12
Do. 25 do.	10
After which the number of returns will continue at	8
Land not bunded for the first 5 years	10
For the next 5 years	8
Do. 2 do.	4
When the land becomes completely exhausted and requires a fallow of 5 years to recover.	

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NUMBER of Returns of Grain in the Bandwas Lands of Mandla which yield Two Crops in the Year, one of Kharif and one of Rabi.

Soil.	1st Class.	2nd Class of either of the under-mentioned Grains.					
	Rice.	Wheat.	Gram.	Massur.	Teorah.	Baterah.	Alsee.
1st Kabar for 25 years	12	10	12	12	12	12	15
For the next 15 years	10	8	8	10	10	10	12
Do. 15 Do.	8	7	6	8	8	6	8
After which the number of returns will continue at	8	5	—	5	7	—	6
There is likewise an inferior kind of bandwas land called sehar for the first 10 years	12	—	—	—	—	—	—
Do. for the next 40 Do.	10	—	—	—	—	—	—
Do. and afterwards	8	—	—	—	—	—	—

I understand that Mr. Grant's conclusion regarding Narsinghpur agrees with what has been arrived at in America, where the question has been closely studied. It appears that land freshly broken up from fallows, unless the wear and tear is made good by manure, rapidly falls for a few years, then the rate of retrogression grows slower, till a point is reached below which its productive powers scarcely diminish.

Mr. Chisholm, the Bilaspur Settlement Officer, recorded that,—

"In this district one hears but little of the exhaustion of the soil; year after year rice is produced in the same fields without any change of crop, or even an occasional fallow: and yet the field is apparently uninfluenced. It seems from the statements of experienced cultivators that new land falls to the level of old in four or five years, and that during this interval the extra yield averages from 25 to 30 per cent. There is no further progressive deterioration. Rice is not an exhaustive crop, and the land is generally manured. This may account for the fact that rice is the only crop with which neither rotations nor fallows are practised."

Up the Nerbudda Valley, in the Mandla District:—

"In some parts of the district, where the richest black soil is found and the land is bunded, there never seems to be any thought of the soil being exhausted; year after year two crops are taken off the land, which is only by accident ever allowed to remain fallow even for a season. Such accidents as the present year, 1868–69, gives an instance of when the exceptionally small fall of rain not only damaged the rice crop, but left the ground too hard and dry for the usual second crop to be put in, otherwise these haveli lands in Mandla may be said to have been continually under cultivation since the time of Hirdeh Shah, who first induced cultivators to take them up in Sambat, 1716, A.D. 1660, or a period of about 200 years. It is, however, most probable that when the demand for land was small the cultivators took up fresh ground occasionally, leaving their best fields fallow, but no authentic records show this. Now the cultivator appears to be under the impression that the rich kabur soil requires no rest, and is never exhausted by rice or wheat; occasionally a crop of gram or massur is sown by way of a change.

"With the poorer soils it is quite different. The light sandy soil 'sehar' has to be left fallow about once in every three or four years, unless bunded, and then it requires no rest. The burha soil is completely exhausted in four years, and has to be left from six to eight years before it recovers its original fertility; then the crops raised on it appear to be of a peculiarly exhausting nature, for even black soil deteriorates much under a crop of kodu; and the Gonds never think of any rotation. Land has been so plentiful that as soon as one field began to be exhausted the cultivator took up another. Occasionally the good soil is overrun with the 'kans' grass, which it is next to impossible to eradicate; it takes from five to seven years to exhaust itself, and the cultivator seldom makes any attempt to destroy it, but leaves his field and goes elsewhere. This 'kans' grass is so rank and its roots descend to such a depth, that to eradicate it completely it would be necessary to dig down to the depth of at least 3 feet, and for this in the present low demand for land there is neither any inducement nor necessity. As an instance of the great fertility of the black soil, the maafidar of the village of Bokur has pointed out fields which have been cultivated with rice even since the village has been in his family, and his possession dates back 150 years. These fields have been handed down from father to son, and never been known to require any rest or change of crop. The native theory on the subject is much the same as that arrived at by careful analysis, *i.e.*, that the action of the water on the subsoil and strata of trap below keeps up a continual system of disintegration and decomposition which supplies the place of the good qualities or the soil yearly expended in the produce of the crop, for it is only in bunded lands that this continued series of double crops can be raised. In wheat lands when the produce begins to fall off, a crop of 'jagnee' is sown, and ploughed up with the soil, but this is only once in every 24 or 25 years."

For Chanda I would remark that the same land is sown with rice year after year without intermission or noticeable deterioration.

"When fresh soil is broken up for rice cultivation the ground can never be got into proper order during the first year, and the yield is less than in the old fields. In the second year the return rises about an eighth above that of the old fields, and increases gradually year by year until the fifth, when it reaches 50 per cent. above the yield of the old fields. It then commences to decline, and in about another five years has subsided to the level of the old fields, and at that level it remains unchanged apparently for ever. Many fields for instance are believed to have been continuously cultivated for the last 150 years and more, yet they are in no way inferior to land reclaimed from the jungle but 15 years ago.

"Land growing dry crops seems also to reach its highest point of fertility in the fifth year of cultivation, but it falls more slowly to the level of the old fields than is the case with rice lands, and a field 20 years old will be more productive than one which has been 50 years under the plough. In what time the deterioration ceases, if indeed it ever does cease, cannot be said; but in practice, when a cultivator sees a field becoming sterile he allows it to be fallow for from two to five years, in the meanwhile pasturing his cattle thereon, and when the land is again sown it is found to give a yield equal to its neighbours. Looking to these facts and to the vast quantity of virgin and fallow land available in almost every village we have no reason to apprehend difficulties from any exhaustion of the soil."

The opinion held by Mr. Elliott, Settlement Officer of Hoshangabad in 1865, is thus given:—

"The local word for a field being exhausted is *ruseed*, and in old reports and returns this is a phrase of constant recurrence. There are great numbers of villages against which in the second and third five years settlement books the remark is written, 'Soil good, but quite exhausted;' 'Soil thoroughly worn out.' Yet these same villages and these identical fields have gone on being cultivated from that day to this, with only such fallows as could be allowed by breaking up uncultivated land in place of the field thrown out of cultivation, a resource which has been diminishing every day. In 1830 Major Ouseley wrote of the Sobhapur Taluka as producing only one-third of what the Babai Taluka did, but if this was accurate a very strange revolution must have taken place,—either Sobhapur must have increased in productiveness, though cultivated without intermission, since it now produces as much as or very little less than Babai, or else Babai must have fallen to a third of its former produce, which view appears untenable. Considering these things it would hardly be unreasonable to deny the *ruseed* theory altogether; and this for some time I was inclined to do. I believe, however, that there must be some truth in it, though the form in which it is expressed is much exaggerated, and requires modification. It stands to reason that land, even the black soil of the Nerbudda Valley, must deteriorate if it is cropped year after year without anything being returned to it. There can be no doubt that when this soil is newly broken up (after the first year) the produce is for two or three years greater than it is afterwards. In the Tapti Valley at present the wheat stands breast high in some of the new villages, and the ear is very large and full, and the crop nearly double the average of the Nerbudda Valley, and no doubt when the Nerbudda Valley was first broken up the crops were the same; and as long as half the first class land was uncultivated, and a new field could be broken up for every one thrown into fallow, they are not likely to have deteriorated much. But this was an exceptional time, and when once regular cultivation set in, and the majority of the land came under the plough, a certain amount of deterioration followed. The old rate of produce in the golden age, or 50 years ago, is supposed to have been ten-fold, and judging from the Tapti Valley, which is in the same condition now, I do not conceive it can have been more than twelve-fold. I reckon the average now to be six-fold, and my belief is that it fell very rapidly from twelve-fold to about eight, and then rather slowly to six or seven; that it was at that stage when the land was reported 'very much exhausted' in 1830, and that it has fallen very slightly, if at all, since then. I have formed this opinion from what I have seen of the Tapti villages, which are so modern that their history can be known with certainty, and also from inquiries into the produce of fields newly taken up from fallow, which for a year or two produce a little more than their neighbours, and then fall to the general level. Lighter soils get exhausted sooner; sandy and gravelly fields will often bear only four or five years' cropping with kharif; second class rabi fields will last longer, but must be thrown up at last; but the true black soil, if properly cultivated, will I think go on producing at the rate of six-fold for ever, and will not fall below it. Of course this is a question which can only be thoroughly tested by experiments, and by accurate knowledge of the history of certain fields; and unfortunately Major Ouseley left no records (or at least none can be found) of his many experiments in agriculture. But I believe bad cultivation will mostly be found responsible for faults laid at the door of the soil; and I have never yet seen a field obviously inferior to its neighbour whose inferiority could not on inquiry be traced either to omission of one of the required ploughings, or to unseasonable sowing (the cultivator having been ill or absent at the proper sowing time), or to *kans* having got into the land and not having been eradicated. Manure is of course the natural remedy for exhaustion. The village of Kollomree, near Hoshangabad, was recorded as one of the most 'exhausted' villages in the district 30 years ago. I inquired for and took the most exhausted field in the village, and manured and cultivated it two years running.

"The first year (1864) I raised a crop of four maunds of gram and one a half of barley. The gram was a good crop, eight-fold the seed; but the barley was a failure, and wanted water.

"The second year (1865) which was not on the whole a favourable season, the crop was eight maunds of wheat, or eight-fold; there was only one field on the village equal to it, and that had been taken up from fallow the year before.

"The opinion which I formed from observation and inquiry as to the exhaustion of the soil is supported by Mr. Waldie's analysis and report. He says: 'The soil consists of trap rock in process of disintegration, and the two columns of soluble and insoluble in acid show the progress of decomposition of the rock. The chief peculiarity of the soil will be the constancy and regularity of its supply of mineral constituents to vegetation, from the gradual decomposition of the rock by

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Central Provinces.

Mr. Nicholls.

the carbonic acid and oxygen of the atmosphere, with water, and the changes of temperature.

"'These are the agents, comparatively feeble in their chemical powers, by which nature very slowly produces the same effect which the chemist does so speedily in his laboratory by the most powerful acids and alkalies. Trap rocks and many others besides consist of a conjeries of minerals in small crystals which undergo decomposition irregularly, some of these minerals being more easily decomposed than others. They consist mainly of silica, which is a weak acid, combined with various bases, and the process of decomposition separates the silica from the bases. A small portion of both silica and bases is dissolved by water and washed away, but the greater part remains, and the result of the whole may be stated comparatively thus :—

Bases, viz., alumina, oxide of iron, lime, magnesia, potash, and soda	—	12
Carbonic and phosphoric acid in combination - - -	2	—
Silicia, partly in combination, partly in mechanical mixture, which had originally been in combination with these bases - -	10·5	—
		12·5
Water and a little organic matter -	—	7·8
Mineral constituents of the orginal rock, which have not yet undergone decomposition - -	—	67·7
		100·

"'The decomposition of about 67 per cent. will be favoured by everything that promotes its exposure to the agencies specified above, such as ploughing and loosening the soil.'

"In other words 67 per cent. of the soil is trap rock, simply ground to powder (by the action of ice or of water), but not decomposed, and unable to yield any of its virtues to promote vegetation, except by the slow process of decomposition year by year. Only on 24 per cent. of the soil does the cultivation tell at all, and from this portion our wheat is produced. Not till the whole of the soil is decomposed, and all its resources drawn on by the cultivators, can there begin to be any fear of exhaustion. At present my view is that the annual exhaustion of the 24 per cent. is compensated for by the annual decomposition of the 67 per cent., and thus the vegetative power of the soil is unaltered, and the same crops can be produced year by year. If larger crops are raised the balance will be disturbed; and the object of scientific agriculture must be either to increase the rapidity of decomposition of the 67 per cent. or else to strengthen the 24 per cent. by manures, &c."

Mr. Grant, when Settlement Officer of Narsinghpur, carefully considered this question, and gives his conclusion thus :—

"Admitting then that the present returns average not more than four-fold, and that the returns for perfectly fresh soil are twenty-fold, the extent of deterioation in little more than half a century would seem to furnish a not unnatural cause for alarm. But it is a question whether this alarm has not been exaggerated. Mr. Maloney and Captain Sleeman, who are the only authorities regarding the early condition of the valley, naturally attached great importance to the deterioration of the soil, for it was going on, and that rapidly, before their very eyes. All subsequent writers on the affairs of the district seem to have followed blindly in their footsteps, and it is almost a *reductio ad absurdum*, of an undoubtedly true theory to find one of the district officers writing in or about 1830 that the returns had then sunk in places to two or three-fold, and that ruin was hanging over the cultivating classes.

"The re-assuring feature in the otherwise disquieting decline of fertility in the soil is that the deterioration has not been gradually progressive, but that commencing with a very considerable impetus it has now become almost stationary. It will have been seen from the figures given above that while 20 years' cultivation reduced the returns from twenty-fold to six or seven-fold, it has taken nearly double that time (from 1828 to 1866) to reduce them from five-fold to four-fold, and the present rate of diminution is so minute as to be imperceptible. Therefore for all practical purposes it may be assumed that the rates of produce will remain constant at the present point, even if improved modes of cultivation are not introduced in the course of the present settlement."

The Settlement Officer of Jubbulpore remarks that,—

"Continued cropping tends to exhaust tagur lands in the Haveli Perganna; they are then styled 'narung' and must be allowed to rest for a year or two every five or ten years, otherwise 'kans' grass (*saccharum spontaneum*) makes its appearance, which takes several years to die out. In the hilly tracts the soil is generally poor, but the population being scanty and land abundant it is more profitable for the cultivator to shift the cultivation in every two or three years than to incur the trouble and expense of manuring and irrigating his fields."

Captain Thomson wrote thus of Seoni,—

"With regard to deterioration by continued cropping which has been so much discussed, I have also heard complaints, but it is chiefly in the lighter kind of soil the moorund, that it seems to be much felt, and, as shown by Mr. Grant, it does not increase or is only progressive in a very slow rate, and with irrigation and manuring it would disappear. But so much of the land of the district is new that the complaint is not so general as in older districts, such as Narsinghpur and Hoshangabad."

In Damoh natives say that the appearance of kans grass betokens exhaustion. Probably it shows bad farming, want of weeding, want of ploughing, want of rotation, want of manure, and does not arise from more than the temporary exhaustion of some of the necessary salts of the earth which have to be replenished naturally by rest or by change of the cultivated crop or artificially by manure.

It is well known that one plant especially takes up the salts of potash, or of soda, or of lime, or affects the nitrates or phosphates more than another; each plant in short has its special chemical food, and, to cultivate the same land in consecutive years by plants which have the same favourite food must tend to exhaust; while by varying the plants so as, in the second year, to bring into requisition another set of salts, gives just as much rest as a fallow would give. When from neglect of these considerations, and as he will not manure, the native finds his crops decrease yearly, he gets more careless about weeding, and will not thoroughly plough his ground, but merely scratch the surface.

Under such circumstances, when the breeze wafts a ripe seed of kans grass on to the neglected field, it finds a home. But where the cultivator has done justice to his field and is hopeful as to its productive powers for future years, he is ever ready to root out his enemy, as soon as it shows its appearance. Kans will grow as luxuriously and quickly on the richest black soil as on the poorest black soil, therefore I think it is a sign of neglect and of bad farming, not of deterioration or even temporary exhaustion of this soil.

The following remarks were made by the Settlement Officer of Saugor and of Damoh regarding this noxious grass :—

"To the south of perganna Shahgurh irrigation does not appear necessary, the soil being generally of a better quality, still the cultivation is solvenly, and there are no signs of enterprise. Here again the kans grass (*saccharum spontaneum*) is the great enemy of the cultivator. It springs up where the ground is in any degree exhausted or neglected, left fallow, or indifferently tilled, even for a year. It sends down its roots to an amazing depth, and forms a complete reticulation of roots throughout the entire extent of land covered by it; so that to subdue it

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CENTRAL PROVINCES.

Mr. Nicholls.

when once fairly established becomes a most difficult matter; and as its properties are exceedingly exhausting and heating, the cultivator has no resource but to throw his land out of cultivation until a period of 12 or even 15 years, when the weed dies out of itself.

"I have no doubt but that with deep ploughing and good powerful bullocks the noxious weed could be rooted out; but with the primitive plough now in use here, which simply scratches the upper surface of the soil, it is utterly impossible to do so.

"The soils of Etwa are in general of good quality, except in the villages near the Bina, where they are of inferior quality in comparison with the more inland villages. The lands that have been long under tillage are said to be much exhausted, and much of the fallow is covered with kans grass.

"The local names of soils are the same as in other parts of the district, and have already been described.

"I would here for the last time refer to that serious impediment to cultivation kans grass (*saccharum spontaneum*) the appearance of which always threatened the rich land of this tract, and must never be lost sight of in calculating its future capabilities. I have written fully on the subject in that part of my report which refers to perganna Jaysinghnagar."

Damoh.—The only effectual remedy for the eradication of the kans grass is embanking the fields and holding the rain water until the middle of October, by which means its roots, which run very deep into the soil, are destroyed. Deep ploughing with the description of plough in use will not effectually destroy the roots, and there is no remedy but to allow the land to remain fallow from 10 to 15 years, after which the grass dies away. It grows so much faster and stronger than any other crop which can be sown that nothing will grow in a field overrun with kans. The people are quite aware that embanking fields is the only effectual method of overcoming their great enemy, but heretofore they have been too poor or too apathetic under a crushing assessment to take any measures for remedying the evil. Let us hope, however, that during the currency of the present settlement much may be done in this respect. Signs of prosperity are already observable in the district, as within one year of the new assessment nearly 10,000 acres of fresh land have been brought under tillage, and if this improvement steadily goes on, and the life rent-free tenures fall in, it is not too much to expect that the district will easily bear a demand of three lacs of rupees at the next revision of settlement.

QUESTION.—*Does any such question (as to deterioration of the soil) specially arise in case of irrigated land?*

Apparently no such question arises. Reh is unknown.

BERAR.

BERAR.

Mr. Dunlop.

A cotton department was formed in the end of 1866, and up to the time of its abolition in 1874 the improvement of agriculture, and the development of trade, which has a direct and very powerful influence on agriculture, received much attention.

Two model farms were established, one in the Akola and one in the Amraoti District, and in these agricultural experiments were conducted with more or less success. But the farms, although useful in so far as they showed us the capability of the soil and climate, did certainly not fulfil the object with which they were established, viz., to be a means of diffusing knowledge among the agricultural population. Very few agriculturists, beyond those whose services were engaged on the farms took any interest in them, and the annual expenditure being very high, the Amraoti Farm was closed in 1873 and the Akola Farm in 1874; there is now no model farm in the province.

Suggestions for Improvements.—Some suggestions will be found in the extracts above referred to. I would add to these that, in my opinion, there is great room for agricultural improvement in Berar. While the Cotton Commissioner (afterwards the Commissioner of Cotton and Commerce with the Government of India) was connected with the province our attention was constantly directed to subjects of this nature, but since 1874, so far as it is within my power to judge, matters seem to have been left very much as they were, and little or no practical interest has been evinced in agricultural matters.

Since that date the North-West Provinces have been given a Director of Agriculture, and in Madras the services of the Superintendent of the Government farm at Sydapet have been utilised generally over the presidency, but in Berar we have been stationary.

As the least that should be done in a province where the State possesses all proprietary rights on the soil, I would recommend that a limited sum be set aside annually for experiments at tahsíl towns. Money judiciously expended in this way will be likely to have much more effect than a large sum laid out on a model farm which is accessible to only a few people. In these experiments I would continually keep before the people the advantage of—

1 deep ploughing;
2 manuring;
3 selection of seed; and any other points that may from time to time come under notice, always, however, having regard to economy, and to what the people themselves are likely to be able to afford, and may reasonably be expected to adopt.

For instance, to give but one example, if a number of experiments with bone manure were made in different talukas the people would not be long in making use of all the bones which are thrown away as useless.

But whatever is done in this direction must be done systematically. Results must be properly recorded and published, and above all Tahsildars, through whose agency the operations would necessarily have to be conducted, must be taught to take an active and intelligent interest in agricultural matters.

Some years ago we had a Government bull at Akola, but it was not made much use of. I have not heard of any other attempt to improve the breed of cattle. I think more might be done in this direction. The Berar cattle, although small, are strong and very useful animals, but no proper system of breeding is observed by the people.

Khamgaon was at one time well known for its breed of bullocks, but animals of the description formerly obtainable are now very limited in number, and difficult to procure. A Government stallion is kept in the Buldana District. He served 45 mares in 1875–76 and 36 in 1876–77.

There has been no change in the ploughs or agricultural implements. English ploughs were introduced on our farms, and one or two were taken by native cultivators, but they did not continue to work them.

A decided improvement is noticeable within the last 10 years in carts. The small native *katchar* is being gradually displaced by a larger cart with broad tire wheels.

Many carts on the pattern of the Madras bandy are now plying in the province, and the number of these may be expected to increase as our road system is developed.

Double môts for lifting water, workable by one animal, have been recently erected at certain populous centres in the Ellichpur District, on patterns obtained from Coimbatore. The Deputy Commissioner does not know if they have, up to date, been copied by any agriculturists.

An agricultural and industrial exhibition was held in Akola in 1868, at which, in addition to many

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BERAR.

Mr. Dunk

miscellaneous articles of English manufacture, the produce of Berar and agricultural implements and machinery, both English and native, were displayed.

I have been unable to obtain a copy of the report on that exhibition. It no doubt effected some good by bringing people together, and by drawing attention to agricultural and manufacturing pursuits. At the same time, I have never observed any direct good results from it.

The bulk of the European agricultural implements* and machinery in the exhibition were unsuited for the requirements or resources of the native agriculturists. We took them afterwards to the Government farm, but could not make much use of them. The native agriculturists took little or no interest in them.

In 1871 the Resident sanctioned an annual cattle show and agricultural exhibition to be held alternately at Akola and Amraoti. I was deputed to arrange for the first of these, but owing to the failure of the monsoon in that year the scheme had to be abandoned, and it has not since been revived.

I think it is to be regretted that we do not do more in this way with a view to encouraging careful agriculture and the better breeding of cattle. The system is carried out with considerable success, and at only a small expenditure, at Myjee in Khandesh. The then Commissioner of West Berar (Mr. Lyall) sent me to Myjee in 1870 to observe the system adopted in that exhibition, and it was a similar exhibition and cattle show that it was proposed to inaugurate in 1871 at Akola.

I have not myself observed deterioration of the soil, and attribute this to the system of rotation observed by the farmers, which checks to a very great extent such deterioration, and makes it so gradual that it is not easily perceived.

Fields in the neighbourhood of Khamgaon which I had under observation 10 years ago, have in 1878 apparently as good crops as they produced in 1868.

I quote the following opinions on this point:—

Major Elphinstone in the Settlement Report of the Darwar Taluka, Wun District.—"Evidence of the gradual exhaustion of the land is to be seen everywhere, and before many years elapse the subject of husbanding and even creating manure will have to be taken seriously into consideration. Many materials for the production of artificial manures, such as bones, alkalies, and various minerals, could be easily collected, and it will be interesting to watch the progress our model farms will be able to make in this respect."

Major Szczepanski, Wun.—"No deterioration in the soil has yet been observed, and when the rainfall is sufficient and seasonable the crops are full and good."

Lieut.-Colonel Menzies, Amraoti.—"There has been no observable deterioration in crops. The soil is fertile, and it will stand about 12 years constant cultivation. Being left fallow for a couple of years* then restores fertility. Manuring goes on to a very limited extent."

Major Mackenzie, Ellichpur.—"I have not observed deterioration, but my opinion is worth nothing. I have not gone into the matter, and if I wished to, reliable data of the past is quite wanting, and without such no inquiry could be of value.

"The popular belief is that there has been deterioration, but I don't know that it is grounded on anything reliable."

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* Ploughs, winnowing, and corn-grinding machines, &c.

* NOTE.—I doubt if it is a common custom in the Amraoti District to let exhausted land lie fallow for two years.

Mr. Jon

I am not sanguine regarding the effects of model farms and exhibitions under the present circumstances of Berar. The mistake is constantly made of regarding these things as the levers by which agriculture is to be raised; *whereas they are merely useful in guiding and possibly accelerating movements which other and infinitely greater causes have originated.* With our sparse population high farming is not to be expected, and farms and exhibitions are almost useless. They will only become useful when the people are compelled by large economic causes to work harder than they do, and to endeavour to get more out of the soil than they do. Even in matters in which teaching might seem likely to be of use the people appear to require that more effective teaching which the produce market supplies. I was once in charge of a branch of the cotton department in the Wardah District, and the conclusion I come to on looking back is that my own small experiments apart, I did not succeed in getting an acre more cotton grown, or in bringing a single bale to market in a better condition than it would otherwise have come. The first cotton merchant who offered in the market some fraction of an anna more a pound for clean than for dirty cotton did more for Wardah cotton than I, with all the resources of Government at my disposal, ever accomplished.

Experimental farms may no doubt be useful even now, and there is ample scope for useful labour in the collection of agricultural statistics, and the like. But I am convinced that we shall only repeat old blunders if we embark on new schemes for establishing farms and exhibitions with the idea that they or any such petty causes will produce the results which we are anxious to effect.

BOMBAY.

BOMBA

Mr. Po

For an account of the three Government farms in Sindh, Khandesh, and Dharwar, see Administration Report, p. 170.

The collectors say,—

Mr. Porteous, Kaira.—There is no model farm in the district, nor have any estates under the management of Government been used for the object of making experiments or setting examples of improved agriculture. Desultory attempts have been made to improve the country rice and tobacco, but the ryots find a ready sale for the common sorts they are in the habit of growing, and will not change them merely with the hope of prospective advantage.

No improvements have been made in the breed of cattle; the breed as it stands is a very good one.

In April 1875 a case of English ploughs was obtained from Messrs. Ransoms, Sims, and Head, of Ipswich, on the requisition of Mr. Ashburner, then commissioner of the division. These ploughs were made over to the Bhow Saheb of Nariad, Mr. Narsiram Vajiram, and Mr. Walji Bechar, all men of position in the district, and all owning and personally superintending the cultivation of considerable estates. They all reported that the ploughs were too heavy for one pair of bullocks, that it was found in practice difficult to drive the bullocks and at the same time to devote two hands to the plough, and that therefore the services of two men were required for each plough. I cannot but think these ploughs did not receive a fair trial. The difficulty of guiding the bullocks and of still finding two hands for the plough is one which might have been got over in a few days training; this is a question of training and nothing else.

If the ploughs were too heavy for the ordinary country cattle, they must, I fear, have been of a peculiarly heavy construction.

At Mr. Harman's Model Farm in Bangalore I have seen ordinary Mysore bullocks, certainly not superior to our ordinary breed of cattle here, dragging an English plough with ease through what struck me as heavy soil to work. Ordinary natives were driving these ploughs, and they did so with no difficulty. I saw a boy of 15, at what I was told was I think his fourth or fifth attempt, driving his plough and managing his bullocks as if he had never done anything else.

In 1876 three Egyptian ploughs were provided by the Commissioner here, and of these two were sold to the Bhow Saheb and Mr. Nursiram Vajiram, but they turned out to be quite as unpopular as the English ploughs previously supplied.

In the beginning of this year a model of the double mhote was received from the Government farm, Sydapet, Madras, but though it was shown to several well-to-do cultivators, and its principle personally explained to them by the Collector, no attempt, as far as I can learn, has been made by any of them to make practical trial of the novelty.

There is some movement now in the district, in which I understand Mr. Sheppard is taking much personal interest, towards establishing some agricultural schools or agricultural classes in schools already existing. Three boys from the Nariad High School were sent in January last to Sydapet to undergo a course of agricultural training there, and their progress is reported to be satisfactory.

Generally speaking, however, the cultivators of the district are so intensely conservative, that a very considerable amount of official pressure would be required to secure their ever giving a trial to anything new.

I have not observed that there has been any deterioration of the soil, or that crops are worse than they used to be within my own experience. My reason for this reply is that after 11 years continuous work in India, and by far the greater part of that time as a revenue officer in immediate charge of talukas, I have never seen any such alleged deterioration made out on evidence that would for a moment stand in a court of justice.

Mr. Propert, Khandesh.—Agricultural experiments of all kinds have been from time to time carried on in Khandesh, formerly as a rule by Government officers in different parts of the collectorate, but for the past few years more particularly on the Government farm at Bhadgaon. Most of the improved kinds of European implements have been imported and constantly worked on the farm, but they are not much appreciated by the cultivators, partly on account of the peculiar habits and defective strength of the latter, but more particularly owing to the enormous expense of the implements, it being found that handwork can be performed at a quarter the expense.

Many new trees and plants of economic importance have been introduced and widely distributed.

A stud of bulls of improved breeds has been working in the district for years, and although a certain amount of improvement is observable, it is meagre in the extreme, considering the expense involved in its accomplishment.

Ploughs of all descriptions have been introduced, and several constructed on the farm, but the native plough is found to be the most generally useful.

The Khandesh cart is a skilfully constructed vehicle and well adapted to the present wants of the people. No improvement is required.

A variety of iron sugar mills of improved patterns, the property of Government, are annually worked in the collectorate. Cultivators readily hire, but do not purchase them, as although they possess decided advantages over the ordinary wooden mill, these are not sufficient to compensate for the original extraordinary outlay.

Bucket lifts, chain and centrifugal pumps and other complicated appliances for lifting water have been perseveringly subjected to experiment, the indigenous mhot however, on account of its simplicity and the ease with which it can be repaired, in my opinion beats all other contrivances in point of cheapness.

An agricultural exhibition has been held annually at Maheji in the Pechora Tulka of this district since 1866. Prizes have been freely given for the best specimens of agricultural produce of all kinds; we cannot say that no good results have been obtained, but no general improvement is observable.

Various kinds of European agricultural implements belonging to the model farm, &c. above described are annually exhibited in the Maheji Exhibition, and the cultivators generally are much interested in the working of these, but the price of the machines and the difficulty experienced in repairing them, if even slightly injured, totally prevent their adoption by the ordinary native agriculturist.

I consider that if the rainfall be favourable the soil in general yields crops equal to those of former years.

Unless irrigated land be constantly restored by means of manure deterioration will invariably result.

The replies are based on personal observation.

Kaladgi.—Exotic cotton seed was introduced by Government in 1866–68 with good results. There is no model farm. The breed of cattle is good and does not need improving. The soil is not said to have deteriorated nor the crops to be worse.

Ratnagiri.—There have been many attempts to improve agriculture, both by Government and private persons, with varied success.

Mauritius sugar-cane has been introduced, and has nearly displaced the old red cane.

Carolina rice has been tried, but it is found that the country rice crops of the better lands are equal to the produce of the Carolina seed. The Southern Konkani has nothing to learn from us or America in rice culture.

A new hemp is now being tried; but its success is doubtful.

About 30 years ago an old collector of Ratnagiri, Mr. A. Elphinston, spent a small fortune in trying to improve the indigenous (or Bourbon) variety of cotton, and to grow it in this district. He produced excellent cotton, but at a fabulous cost.

The same gentleman made attempts to improve the breed of milch cattle. So did I. We both had some small success.

Mr. Robertson, Commissioner, Central Division, says:—Nothing has been done by private individuals to improve agriculture, and next to nothing by Government. On the contrary, this most important and pressing duty has been most grossly neglected by Government. The only successful introduction of seed was that of the American cotton into Dharwar. Occasionally some small and next to useless attempt is made to introduce some exotic seed, but the whole experiment is made in such a weak and penurious manner, that no favourable result can possibly be expected. In the course of my service I have seen one or two model or experimental farms. There was one under me in Dharwar. There was a superintendent on 400*l.* per annum. He had only about 75 acres of land. Government would not go to the expense of purchasing more. He had no house, no farm buildings, and was obliged to live four miles from his farm. He was a conscientious man, and urged he could look after ten times the land, that by having a larger charge, he could farm at a far less average cost. He felt much that he could not live on his farm, look after his cattle, collect manure, &c., and arrange to make his farm pay in many small ways. He was for three years unfortunate in his seasons. He cultivated several experimental crops, raised a good deal of good Dharwar American cotton, selecting plants for seed. His pay was not charged against the farm, but still the farm did not pay its way. Though the deficit was trifling the farm was closed because it did not pay. Can an experimental farm pay? The name alone proves it cannot. Each experiment with any new seed or staple may be, and often is, a dead failure. One good success is, in the interest of the country, worth a great many failures. Deep soil ploughing may be good, but it costs much. When

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BOMBAY.

Mr. Peile.

tried one year in some land it was a failure, therefore a loss. Another year in other land it was a marked success. So on it ever will be with a model experimental farm. We want to teach the natives, but have first to learn all they know, prove it, and try to improve upon it. Each improvement secured is a permanent gain worth any reasonable expenditure on a model farm.

As regards cattle and horses, nothing whatever has been done to improve the breed of cattle; a little to improve the breed of horses by two or three Government stallions being kept in each collectorate. The progress under this system is really so slow as not to be appreciable.

The fact is the people have no good bulls, no good rams, no good horse or donkey stallions. Whenever an animal is ready for the male it finds a mate anywhere in the fields—perhaps the bull or stallion thus used may be a perfectly useless brute; the result is that both horses and cattle are everywhere in the Deccan very poor indeed.

It would be well if in each taluka of a collectorate three or four good bulls were kept, a very small fee being charged for their services.

I hold that there never can be any real and permanent improvement in cattle or horses till we go to the root of the evil, and take steps to stop the keeping of useless bulls and stallions.

I advocate a tax on all whole animals, exempting from the tax all whole animals which have been passed by a Government veterinary surgeon as fit for breeding purposes. This could only be introduced gradually. The first year the tax would be put on all one-year old. The second on all one and two-years old. The third year on all one, two, and three-years old. The fourth year on all one, two, three and four-years old, and the fifth year on all one, two, three, four, and five-years old, and so on till it was general.

Native cultivators will not make experiments, but when they see a thing a proved success they will, if they can, adopt it. Take for instance the collectorate of Dharwar, where, through the exertions of the collector, Mr. Shaw, American cotton was, after years of hard work, successfully introduced. The ryots saw it was better than the country cotton, and now there are upwards of 350,000 acres yearly planted with it. The acclimatized Dharwar-American has been found to succeed in Khandesh, where Mr. Ashburner had successfully introduced the Hinganghat cotton, and being the best cotton, its cultivation is extending very rapidly in Khandesh.

I cannot say I have observed any deterioration of the soil, though natives everywhere assert it has deteriorated.

It must on this point be remembered that the revenue survey has been so successful that cultivation has extended greatly, and that the area under cultivation is in some places more than double what it was previous to the survey. In old days only the land near the villages were cultivated; now most outlying lands are taken up for cultivation. Consequently there are no fallows. Land is overworked, and not being manured must deteriorate somewhat. Formerly there was so much good waste land that when a cultivator thought his land was somewhat exhausted he gave it up, and took up a new plot which was comparatively virgin soil, not having been cultivated for a long term of years.

As regards the effects irrigation has on land I can say nothing. The natives hold that continually growing irrigated crops on land wears it out.

Colonel W. C. Anderson.—In the Dharwar Collectorate about 40 years ago Government attempted to introduce New Orleans cotton, but till about 1847 with little success, though a considerable amount of pressure was used. About that year all pressure was removed, the area fell off at once from about 20,000 acres to one-fourth of that area; those ryots who had found it answer continued cultivating it to advantage, others followed their example, and the cultivation of this cotton soon rapidly extended, and in a few years exceeded that of native cotton, the whole area annually under cotton in the collectorate being now rather over than under five lakhs of acres. The New Orleans cotton has been a great source of wealth to the people of Dharwar; the produce of clean cotton per acre is a full one-fourth more than that of native cotton, and the price per lb. always rules higher than that of the indigenous cotton by perhaps 10 to 20 per cent. Attempts were made to introduce New Orleans cotton into other collectorates, but with little success. It requires a moister climate apparently than exists, except in Dharwar. It has also extended from Dharwar into the contiguous north of Mysore. An obstacle to its spread there is the want of facilities for the repair of ginning machinery, as the fibre can only be separated from the seed by such, and not by the native methods, foot-rolling, &c. In Dharwar Government provided shops for the repair of gins, to which the Mysore people resorted, or brought their cotton in seed into the Dharwar districts and sold it there.

I am aware of no agricultural exhibition in the south of the presidency, and of no improved implements having been introduced except the saw gin. The ordinary native implements of agriculture I believe to be fairly efficient if properly used, but though slow to change their ways the people will do so, generally, readily if they see that benefit will result and changes are not pressed on them, in which case distrust arises.

I have certainly not observed any general deterioration in the soil; on the contrary, crops are generally better now than formerly, from more careful cultivation, though there is still room for great improvement in this respect.

It is commonly believed that continuous irrigation deteriorates black soil and renders it too cohesive. The quantity of manure in the shape of village sweepings applied for a succession of years tends to correct this quality, this manure, besides vegetable matter, containing a good deal of earth of a less cohesive tendency than black soil. A cessation of artificial irrigation, and exposure to rain alone, for a year or two, is believed to remedy the cohesiveness. Facts as observed on soil under my own eye tend to confirm this.

Mr. Erskine, Commissioner, Northern Division.—A few attempts have been made to improve agriculture, but on so small a scale that they are hardly worth alluding to. Government have supplied English ploughs of different patterns for trial in the Ahmedabad and Kaira districts; but these have, as a rule, been found too heavy, and were not taken to by the cultivators. In the Ahmedabad districts, some slight desire for Howard's small plough has been manifested, especially in the Christian village near Shahwadi, in the Daskrohi Taluka, where, owing to the example and encouragement given by the missionary, the plough has been a good deal used and with very satisfactory results; and there can, I think, be very little doubt that, especially in seasons of deficient rainfall, the out-turn of grain would be largely increased by the use of a better plough which ploughed deeper than the native one ordinarily used.

Some attempts have been made, but only by individuals, to improve the breed of cattle. Government has, however, attempted to improve the breed of horses by locating good stallions of English and Arab blood in various localities, and have succeeded fairly well; but much remains to be done before any marked effect can be expected. I may observe that the cattle, especially draught bullocks, of the greater part of Guzerat are remarkably fine, and scarcely require much to be done to improve them. It is where there are large areas of waste lands as in the Panch Mahals that the cattle are worst. In these localities, immense numbers of cattle are collected at the breeding season in the forests and grazing lands, and no care is exercised to select suitable bulls to cover valuable cows; all is left to chance, and the result is the majority of the animals are absolutely worthless.

P. I. Qn. 7.

MADRAS.

Board of Revenue.

MADRAS.

This question was one of those referred by Government to the Superintendent of Government Farms, and, with reference to a great part of it, it is unnecessary for the Board to go over the same ground. They will merely remark, with regard to the first portion of the question, that attempts have every now and again been made by Government in all the directions referred to, but that with the exception of the naturalization of Mauritius sugar-cane, nothing can be definitely pointed to as a lasting result either of agricultural exhibitions or of experiments in the way of introducing new staples or improved implements. Details will be found in the Collector's reports. Those reported from Salem form a good specimen of the endeavours which have been made from time to time by district officers who took an interest in the subject. No estates under the management of Government or of the Court of Wards have been used for the object of making agricultural experiments. The improvement of cultivation and the diffusion of agricultural knowledge is now being carried on in a more systematic form in connection with the Government farms and the School of Agriculture, the operations of which will, it is hoped, be considerably developed at an early date. The ordinary cultivator has never been known to show any willingness to imitate or adopt any improvements exhibited to him. To a certain extent this must in fairness be attributed to the fact that his means and the accidents of his surroundings will often not permit of his doing so, but there is also no doubt that he is both conservative and suspicious in agricultural matters as in everything else, and it is with the rising, rather than the existing, generation that any decided advance can be looked for. The successful introduction of Mauritius sugar-cane, however, is sufficient to prove that even the conservatism and prejudice of the ryot will give way to a clear demonstration of the practical advantages to be gained by the adoption of the novelty recommended to him.

No collector has reported that there has been deterioration of the soil within his own experience, but some are satisfied from the inquiries they have made that deterioration is going on. In some localities there is a strong popular belief to this effect, and in such cases there is no want of unhesitating allegation. The following extract from the report of the head assistant of Bellary will show the lengths the ryots are prepared to go when contrasting the present with the past: "The fact, however, remains that old and "intelligent ryots state positively that lands which "used to produce 20 tooms of grain some 30 or "40 years ago without much manure now only pro- "duce 10 tooms however highly manured." The Board need hardly say that they attach no importance to mere assertions of this kind, however positive or however old and intelligent the ryots may be. There is no reason to doubt that for many hundreds of years the methods of cultivation and the implements used have remained unchanged throughout Southern India, in which case, except as regards newly cultivated lands, the question of deterioration within the observation of living witnesses is mainly a question of whether manuring is less carefully attended to than formerly. It is generally admitted that high farming has never been the rule in India, except as regards garden cultivation, and there can be no doubt that a great portion of the old (especially unirrigated) cultivated land of the presidency has for a long period been in an exhausted state, far below that stage in which a noticeable deterioration can be observed from year to year, except as a result of less careful cultivation. In several districts this fact appears to have been recognised and the deterioration believed in by the ryots is ascribed to the clearing of forest bringing about a decrease in the quantity of vegetable manure available, while the dearness of firewood resulting from the same cause has led to a greater consumption of cowdung as fuel. Here a rational ground is assigned for the popular belief, but at the same time the fact must not be lost sight of that even now the ryots in very many cases do not make the most of the manure still available, and it is by no means certain that they made a proportionately better use of their opportunities in days gone by. The only collector who reports his own experience on the subject, Mr. J. F. Price, of Chingleput, states as follows with regard to the district of Salem: "A good deal of land of very bad "quality was within my knowledge, by means of "treatment with manures and being well turned up, "brought to bear finer crops than when I first "saw it."

From Kurnool it is reported that the ryots attribute the deterioration to the absence of manure resulting from a larger extent of cultivation without a proportionate increase in the number of cattle. Here again there is a plausible reason assigned and one which may operate in fact for the next few years owing to the recent great mortality of cattle, but it is to be observed that the quinquennial statements prior to the famine tell a different tale, thus :—

—	1861–62.	1871–72.	Per-centage of Increase.
Acres cultivated - - -	1,060,295	1,143,592	7·7
Tilling cattle - - -	136,418	178,567	30·9
Cows - - - - -	51,098	58,050	13·6
She buffaloes - - -	70,610	83,233	17·9
Sheep - - - - -	151,863	224,199	47·6

The Board do not place much reliance on the entries in the quinquennial statement as regards live stock other than tilling cattle, but they probably do not err in the way of exaggeration.

In paragraph 92 of his memorandum addressed to Mr. Ballard, the Acting Superintendent of Government Farms remarks: "It is also known that the "area annually relinquished increased during the 15 "years ending July 1872 by about 75 per cent., "showing that the lands under cultivation cannot "now so long support the racking system of cropping "pursued by the ryots." In separate proceedings the Board have pointed out to Mr. Benson that the figures on which his calculations are based do not distinguish between *bonâ fide* relinquishments and transfers of different kinds, and but little support is given to his view by the figures given below, which relate to *bonâ fide* relinquishments only. Earlier figures are not available :—

Year.	Ryotwari Holdings.	Cultivation.	Waste (Fallow).	Relinquished.	Per-centage of Waste to Holding.	Per-centage of Relinquished to Holding.
	Acres.	Acres.	Acres.	Acres.		
1865–66	18,243,639	16,046,009	2,197,630		12·04	—
1866–67	18,514,593	16,488,203	2,026,390	876,388	10·9	4·83
1867–68	19,005,610	16,935,060	2,070,550	571,463	10·8	3·08
1868–69	19,212,865	17,160,525	2,052,340	652,447	10·7	3·43
1869–70	19,612,378	17,563,501	2,048,877	657,281	10·4	3·42
1870–71	19,987,687	17,927,960	2,059,727	623,784	10·3	3·18
1871–72	19,685,938	17,615,529	2,070,409	1,008,738	10·5	5·04
1872–73	19,742,748	17,943,058	1,799,690	764,430	9·1	3·88
1873–74	19,632,436	17,328,509	2,303,927	821,997	11·7	4·16
1874–75	19,958,014	17,746,237	2,211,777	556,648	11·1	2·83
1875–76	20,021,386	17,462,111	2,559,275	649,206	12·7	3·25

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MADRAS.

Board of Revenue.

From the above statement it is clear that there is no tendency to an increase in the proportion borne by relinquishments to holdings.

The question of deterioration does not specially arise in this presidency with regard to irrigated land. On the contrary visible deterioration is apparent chiefly in connection with unirrigated land newly taken up, and not unfrequently relinquished again after some years in favour of another fresh field, or one that has had some years rest. Some years ago a special investigation was found necessary in consequence of the numerous complaints of a saline efflorescence on lands newly brought under irrigation under the Kistna anicut, but it was found to arise from causes irrespective of irrigation, and yielded readily to treatment. Other collectors allude to similar temporary deterioration elsewhere, but the ryots know how to deal with it.

Since writing the above, the Board have seen Mr. Rundall's report, submitted direct to Mr. Ballard, and would commend it to the special consideration of the Commission.

MYSORE.

MYSORE.

Mr. Rickett

Mr. Ricketts.—We have had cattle shows, but on no regular fixed principle. The show par excellence would appear to be that of Adunkay, in the Nellore District. It is not a spasmodic show, but has been systematically carried on for years, and even I believe pedigree books kept up, and the result has been splendid—calves which at four months old were nearly half the size of their mothers. This Nellore Cattle Show has conclusively shown the highly improving results obtained by putting good bulls to even poor and ill-bred cows. Where there is much grazing land there will be found numerous poor cattle. Where the keep of cattle is more expensive, then self-interest teaches the ryot that it hardly costs more to keep a good than a poor beast. I have myself witnessed an illustration of this in a certain taluk in the Hyderabad country, where there was literally no waste land and the cattle were virtually stall-fed, consequently the cost of keep was considerable, and the result was that all the cattle were of excellent breed.

Mr. Harman.—Breeds of cattle.—Prizes were given formerly at a fair near Nundidroog, but the fair has ceased.

No attempts have been made at improving the milking qualities of the cattle, nor any to check degeneracy.

Thus, the improvements most required on dry lands are,—

1. Deeper cultivation.
2. The better conservation and preservation of manure.
3. The utilization of waste substances.
4. The growth of fodder crops.
5. The preservation of grazing grounds.
6. The growth of fuel trees.

The improvements most required on wet lands, are,—

(*a.*) Tank irrigated land, 7, the cultivation of crops requiring less water than paddy.

8. Increased growth of pulse crops for green manuring.

9. The substitution of dry for wet preliminary operations.

10. The introduction of fallow on clay lands.

11. The use instead of the abuse of water.

(*b.*) Channel irrigated land.

12. The substitution of other crops for paddy.

13. Deep cultivation.

The improvement of stock,—

14. Compulsory castration of bulls and rams not passed by a Government inspector or veterinary surgeon.

15. Distribution of good bulls and rams.

16. A tax on goats to at once diminish these animals and encourage the breeding of better milking cows to supply their place.

17. The growth on taluk farms, to be afterwards mentioned, of guinea grass and other fodder plants, so that the ease with which they can be grown and their value may be clearly demonstrated.

Other improvements,—

18. Many products now grown as potatoes, ground nuts, and guinea grass might advantageously be grown over parts of the province in which they are now unknown.

19. The assistance of Government, who should guarantee to purchase improved products such as cotton, &c., and bring it into the market, otherwise such products meet with a sale in the local market, and the ryot is unable to export himself.

20. If there were proper appliances, the growth of Carolina paddy, impressed cotton, and other crops, which through valuable importations have failed when dragged down to the level of the growth of country crops, might be revised and extended.

21. If the landowners saw that the great landlord, the Government, took a greater than a tax collector's interest in its estate, and gave them means of acquiring a knowledge of the principles of agriculture, they would become valuable leaders of the people instead of being mere nonentities.

The famine has caused much of the land to pass into the hands of Brahmins who are often ignorant of agriculture and useless drones of society. If they had agricultural education they would be better instead of worse than the ryots they supplant, as the direct payers of candayem to Government.

RAJPUTANA.

RAJPUTAN

Capt. Ba

Jodhpur and Jesalmir.—No attempts have been made by the Government of the states of Marwar and Jeysulmere to improve agriculture, with the exception of the extension of bunds and other means for storing water. The Maharajah of Jodhpore interests himself largely in these measures, and has built with successful results several masonry bunds and water conduits in the neighbourhood of his capital. The implements used in agriculture by the cultivators of the country are of the rudest sort, but the soil is easy to work, and the cattle employed for agricultural purposes are particularly strong and active. The Persian wheel is in ordinary use for irrigation from wells; the channels for carrying water from the wells, &c., to the fields to be irrigated are cleverly made, and I notice that in this respect the cultivators of Marwar are in no sense behind their neighbours in the best cultivated opium districts of Malwa, where, during a period of eight years I had many opportunities of witnessing the labour and skill expended on the growth and preparation of Malwa opium; in fact I am of opinion that the care bestowed in the use of water and the mode of its application to the crop is greater in Marwar; no doubt the reason for this is to be found in the fact that water is so much more valuable in this country. The chief wealth of Marwar and Jeysulmere consists in the herds of cattle, horses, sheep, and camels which are bred throughout the country. I am

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AJPUTANA.

Capt. Barr.

not aware of any improvements that have taken place in the breed of these animals, but they have certainly attained a fair standard, as their value is admitted throughout India.

Colonel Brooke estimated the number of horned cattle in Marwar at 2,250,000 head in 1868–69, and though one of the results of that year's famine is to be found in the diminished number of cattle, it is believed that at least 2,000,000 are still fed yearly in the plains of Marwar. Camels and horses, as well as sheep and cattle, find a ready sale at the fairs of Pushkur, Tilwarra, and Purbutsur.

Major Powlett.—*Kotah.*—During the time that the famous minister Zalim Singh was in power a great deal was done in Kotah to develop agri-horticulture. That period extended over 60 years, ending about 1824. His marvellous powers of organization enabled him to farm with his own cattle 300,000 acres, and, as already mentioned, he speculated on an enormous scale in grain (see Tod's *Annals of Haraoti*, chapter VIII). He brought large tracts under cultivation, introduced a superior plough, attempted to bring into use powerful foreign cattle, imported foreign fruit trees, and improved indigenous ones. But since his time not only has nothing been done, but there is little trace of the improvements he introduced; though the evil he did in establishing an oppressive revenue system exists in full vitality.

His deep cutting ploughs are no longer seen; his superior manufactures cease to exist, and his fruit trees are no longer remarkable. The large quantity of land which he farmed has been broken up into small holdings, and made over at favourable rents to persons with influence at court, and a great deal of cultivated land has become waste. I hear a good deal of the deterioration of unirrigated land owing to constant tillage. I am told that in 20 years after it is broken up land loses 40 per cent. of its productiveness, but does not deteriorate beyond that point, and can be restored by two or three years' rest. It begins to deteriorate seven years after it has been brought under regular cultivation. However I have not yet been able to go into the subject sufficiently to feel full confidence in the figures given.

r. L. Saunders and Ir. White.

Ajmere.—*Mr. L. Saunders and Mr. White.*—No regular and sustained efforts have ever been made by Government or by private individuals to improve agriculture in any way.

A sugar-cane mill was once brought and used to be exhibited at Pokhar Fair, but as no *gúr* or *rab* is ever made anywhere near Ajmere, no result can be expected. Some Egyptian cotton seed was once sent to the Deputy Commissioner, and was distributed to intelligent zamindars. They did not succeed with it; some straggling plants still exist in the Deputy Commissioner's garden. Guinea grass is grown in the Municipal Gardens in Ajmere, and the town bullocks are fed with it, but the fodder is not popular and no applications are ever received for plants. *Sorghum Saccharatum* had one trial, but showed a most degenerate appearance when it did come up, and has not been tried again. The cattle of the district are undersized and ill-bred, but no serious endeavour has ever been made to improve the state of things.

Colonel Dixon did a good deal to introduce new trees, but I do not think much has been done for agriculture. This is a place where an agricultural college might effect much good if patronised by the Native States. Experiments made here, if successful, and shown to the Mayo College pupils would spread all over Rajputana.

The cattle of the neighbourhood, Marwar (particularly Nagore bullocks, bred only 50 miles away), are famous; the cattle of this country are small doubtless, but the soil is light, and they seem to answer the purpose for which they are required.

Suggestions for such Improvement?

The Court of Wards is generally by far the largest landholder in the province. At present estates with an area of 100,000 acres and an income of rupees 80,000, are under the Court's management, besides five or six other estates managed direct by the Commissioner under the provisions of the *Dami* regulation. These estates are managed just as all the estates of the district are managed: all the old customs and devices and traditions rigorously observed. No attempt is ever made to improve these estates save by the construction of new tanks, new wells, and so on. No sort of direction of agriculture is ever attempted. There is no reason why this should not be done, provided the fitting person can be procured. An agricultural superintendent drawing his pay rateably from the estates under his supervision, and aided may be by a grant from the district funds. The municipalities of Ajmere and Beawar and the District Committee hold large gardens which are all more or less mismanaged. Such gardens might be placed under the Agricultural Superintendent, who might receive Rs. 450 or Rs. 500 per mensem. But all would depend on the man chosen; he must be extremely good tempered and unweariyingly patient. He would be under the administrative direction of the Court of Wards or Commissioner, and would not be allowed to interfere in any way in the management of the estates, save only as an agricultural instructor and inspector. Government has already furnished the district with four high class stallions. The Court of Wards could easily import some good bulls and cows, and could breed horses and fine carriage bullocks were there only some proper person to look after such works. The wealthier *Istimrárdárs* are always ready to be convinced by ocular demonstration, although mere preaching has no effect whatever on them; and they would soon imitate all those operations and improvements which were clearly and obviously profitable. They will not risk a penny on what may not turn out to be an improvement after all, but they are only too ready to imitate when success is obvious. They have no enterprize, but they are always ready to follow a lead about which there can be no manner of doubt.

Mr. Saunders writes: I think this proposal is an excellent one if Government would guarantee the salary when the estates in the Court of Wards cannot afford to pay it.

ENTRAL INDIA.

CENTRAL INDIA.

Lieut.-Col. Bannerman.—*Baghelkhand.*—In my opinion the best thing for Baghelkhand would be an extension of the system of "Bandh Bundi" or embankment of lands for confining the water, which in a hilly and sloping country, as most of the district is, runs to waste; and secondly, to improve the breed of cattle so as to get more power to plough deeper, which the present stamp of cattle cannot do. * * * No one in Baghelkhand admits deterioration of the soil, but there remains one fact which would appear somewhat to support the

CENTRAL INDIA.

Lieut.-Col. Bannerman.

view. It may be assumed that sugar-cane is one of the best and most valuable products of the land, and there are abundant traces throughout Rewah, especially in the remains of sugar mills, &c., &c., to show that in former days it was exclusively grown, but now the cultivation of this crop has almost completely disappeared. The crop requires water, and in the vicinity of the sugar mills there are no signs of irrigation works of any kind, and it must be concluded that the fields were watered from wells, of which at present there are no traces, but which probably in the course of time have fallen. Another possible solution of the disappearance of sugar-cane cultivation, and which appears to me not unreasonable, is that it is not owing to unkindliness of nature, but that the improved communication between Oudh and Rewah, and the general quiet of the country, have convinced the Rewah people that it was cheaper to purchase sugar from the nearest large town than to grow it themselves.

Mir Shahamat Ali, Rutlam.—There is a model farm at Rutlam for making experiments to improve agriculture, where a sugar-cane crushing mill and water lift of English make are introduced, and have been successful. An English iron plough was also hired, but failed to give the desired satisfaction. The financial result is not yet favourable, but in time it is hoped it may succeed. An agricultural exhibition was also held some years, but no good resulted therefrom, and was therefore abandoned. None is held now. No deterioration of the soil is visible. The dry weather and irrigated crops are as good as they used to be centuries ago. No change seems to have taken place.

NOTE on Agricultural Reform in India as proposed and carried out, and the Results thereof.

Mr. Liotard.

I have been directed to prepare a précis of the operations conducted by the different agricultural farms started by Government in the several provinces of India: only those operations are to be noticed for which some measure of success is claimed, and it is not necessary to enter into an account of the expenditure involved in the management of the farms.

In order that the précis may be complete, I propose, while confining myself to the instructions, to give *first*, a brief summary of the scheme of agricultural reform as it was drawn up and carried out; and *secondly*, to notice the successful experiments, with such general observations as suggested themselves to the officers conducting the operations, and to the Local Governments.

In the beginning of November 1871, *i.e.*, a few months after the Department of Revenue, Agricultural, and Commerce was constituted, the Secretary in that department drew up a scheme in view to improving and developing the agriculture of the country.

The main features of the scheme were as follows: A large Government model farm of not less an extent than 1,000 acres was to be started in every district of the country. The object of the farms would be to grow all existing staples, at first in the most approved local native fashion, then, year by year, on improved and ever-improving systems. The seeds to be sown were to be improved every year by selection, and, where necessary, by interchange with other similar farms. Another object of the farms would be to carry on cattle, sheep, and poultry breeding operations cautiously but perseveringly. A third object was to introduce, acclimatize, and popularize staples and breeds locally unknown. In fine, each farm was to become virtually a practical school of agriculture and a source of supply of improved "material," whether vegetable or animal. All the farms were to have free and direct communication with each other, and liberal prizes were to be offered for the most successful supervisors. Provincial exhibitions were to be held, where numerous prizes were to be awarded for excellence of produce, whether agricultural or animal, and these exhibitions were to be open to the farms as well as to the agricultural population generally. A special agricultural journal was to be started for the record of all the operations, successful and unsuccessful, of the farms, so that everybody might be acquainted with the experiments that were being conducted and the results that were being achieved.

In each division of a province, six districts were to be selected, and in the first instance, six farms were to be started in these six districts. These farms were to be placed under picked Europeans with a certain amount of scientific agricultural training; and they were to be aided by intelligent youths, country born, English, Eurasians, or native.

As regarded the lands to be provided for the farms, they were not, as a rule, to be rented from private proprietors, but were to be purchased at auction sales of State lands, which sales "take place in many districts and villages," or they were to be waste lands taken up and tenanted by settlers who were to be brought thither to work on them by a system of inland emigration.

The funds were to be provided by the Local Governments, the Government of India advancing half the cost as takavi, and being repaid by the sale price of crops and other products of the farms. The Government of India were to pay the salaries of the men got out, until they became acquainted with the work and the people, or, say for a period of two years each.

The scheme having thus been conceived, the proposals were forwarded to the different Local Governments and administrations for an expression of their views.

The replies, while supporting the proposed scheme, all tended to show that the extent of land (1,000 acres) to be taken for each of the farms was too large, and the majority of the officials consulted were in favour of starting with 200 or 300 acres in each case.

The Government of Madras, who already had a farm at Sydapet in the Chingleput District, which worked well, proposed to start another in the district of Bellary, a third in Coimbatore, a fourth in Tinnevelly, and ultimately, if desirable, a fifth one in Salem, Baramaha, or Ganjam. Mr. Robertson, who was the superintendent of the farm at Sydapet, was deputed by the Madras Government to inspect and report upon the localities proposed; and it will be sufficient for our purpose if we note that no new farms were started.

The Chief Commissioner of Mysore advocated the establishment of a farm near the railway station of Malúr in Bangalore. He said that arrangements had been made with the Government of Madras for the deputation of Mr. Robertson of the Sydapet Farm to inspect, with the local officers, the several sites proposed for the establishment of farms in view to the selection of one best suited to the objects in view. A further report was promised. In this report the proposal for starting a farm at Bangalore, in preference to other places, was supported, and it was in accord with Mr. Robertson's recommendation. The Government of India sanctioned the proposal, and Mr. F. E. Harman, a graduate of the Royal Agricultural College of Cirencester, was appointed in charge of the farm.

From Hyderabad the Resident's reply came to the effect that in Berar there were "peculiar facilities" for starting such farms as those contemplated, as

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cotton seed farms existed in the province, and the operations of these farms might be extended to embrace agricultural experiments generally. Two farms were therefore proposed and approved by the Government of India—one in East and one in West Berar. But ultimately, for financial reasons, only one was sanctioned as a tentative measure for a period of five years at Akola.

The Chief Commissioner of the Central Provinces proposed to keep on, in the first instance, the farm which had been started by Mr. Bernard at Nagpore near the Ambajhary Reservoir. Then, when this farm proved a success, another would be started in the Wardha Valley; then a third would be tried at Bhandara, and lastly, a fourth in Chanda. The Government of India sanctioned the proposal for maintaining the Nagpore Farm for a period of five years as an experimental agricultural farm.

In the Bombay Presidency there were experimental farms in Dharwar, in Khandesh, and in Hyderabad; and the Bombay Government said that these farms had then recently been placed under the orders of the collectors of those districts; that reports were awaited to ascertain how the new system worked; and that on receipt of the reports the Government of India would be addressed upon the subject of any improvement that might be necessary.

In the Punjab there already existed a farm in Chandi, and one in Amritsar.

In the North-Western Provinces and Oudh some officers agreed and some disagreed with the proposals of the Government of India, while the Lieutenant-Governor said he was not of opinion that the experiment would be likely to be attended with success. There, however, existed at the time model farms at Cawnpore and Allahabad, and a cotton farm at Bulandshahr, and Dr. Bonavia proposed starting a farm in Lucknow, which, however was not started.

The Bengal Government proposed, as a beginning, to establish—

(1.) A set of small irrigation farms in Orissa;
(2.) A model farm of not more than 100 acres in Midnapore near the canal;
(3.) A very moderate sized farm, on the Soane Canal in Shahabad;
(4.) An experimental model farm on the Khasi Hills, Shillong; and
(5.) Model villages in khas and Wards' Estates.

The proposals of the Bengal Government were approved, a money allotment was made for a period of five years, and the Secretary of State was asked to engage the services of competent professors of agriculture.

The Chief Commissioner of British Burma did not approve of the scheme so far as his province was concerned.

Thus experiments were started with the following farms:—

In Madras - - -	the Sydapet farm.
In Mysore - - - -	the Bangalore farm.
In the Berars - -	the Akola farm.
In the Central Provinces -	the Nagpore farm.
In Bombay - - -	the Dharwar, Khandeish, and Hyderabad farms.
In the Punjab - - -	the Chandi and Amritsar farms.
In the North-Western Provinces and Oudh - -	the Cawnpore, Allahabad, and Bulandshahr farms.

and in Bengal the farms mentioned above.

Madras.—I shall now proceed to give an account of any successful experiments conducted by each of these farms, beginning, in the order I have taken, with the farm at Sydapet.

In order that the degree of success achieved in the experiments, which will be noticed, may be fully appreciated, it seems necessary to give some account of the position of the farm with reference to its soil and climate.

The following statement gives in a condensed form all the information that seems necessary under these heads:—

Situation.	Size.	Elevation.	Temperature.	(*a.*) Hottest Months. (*b.*) Coldest Months.	Rainfall.			Soil.
					Average Annual Fall.	Greatest Average Fall for 10 Years.	Lowest Average Fall for 10 years.	
6 miles south of Madras, near the village of Sydapet.	130 acres for an experimental farm. 115 acres subsequently for a model farm.	25 feet above sea level.	80 degrees mean average.	(*a.*) May, June, and July. (*b.*) January	Given as 48 inches; but I find— 57·07 in 1870–71. 52·47 in 1871–72. 86·17 in 1872–73. 48·07 in 1873–74. 68·98 in 1874–75. 38·14 in 1875–76.	9·15 in October. 11·10 in November. 5·62 in December.	1·3 in January. ·8 in February. ·6 in March.	Very inferior; large proportion of sand, and little fertilizing matter.

The farm of 130 acres was devoted from the outset exclusively to experimental cultivation, and has always been meant to be purely educational. It is bounded on the north by a nullah, on the south and east by the River Adyar, and on the west by the Mount Road. With the exception of five acres which could be irrigated from the River Adyar, and a dozen acres by wells, the whole was dry cultivation.

The farm of 115 acres was to be a model farm, to be worked on commercial principles, and to be educational only by example. It was bounded on the north by a cutcherry compound, west by Mount Road and Roshanbagh Village, south by a commissariat slaughter-house and the nullah separating it from the experimental farm, and on the east by the Adyar River; 20 acres of this farm could be irrigated from Mambalan Tank by gravitation, and 10 acres by wells by means of piccottahs, &c.

The object of both farms was to discover the best rotation of crops, the most suitable manures for various soils, and the most economical system of irrigation; also to introduce unirrigated root or green crops instead of fallow, new staples, new agricultural implements, and to improve agricultural stock, seed, and native implements.

Mr. Robertson, a scientific and practical agriculturist, was placed in charge of both farms. At first, he encountered considerable difficulties—the difference in the soils and in the capabilities of the plough cattle, the ignorance and apathy of the workmen, the unsuitableness of the implements used, trespasses of cattle; all these disadvantages militated against any useful and correct results being obtained from comparative experiments. But the difficulties gradually disappeared.

The soil being dry and sandy, manure and irrigation were to be the chief agents to be relied upon in conducting agricultural experiments. There, also, some difficulty was met with, for, excepting the five acres mentioned above, which could be watered by gravitation from the Adyar River, the great bulk of the land was situated at a level of at least 20 feet above the water-mark. Several kinds of water lifts were tried; first a steam water lift driven by an eight horse-power portable engine, which was abandoned on account of its great cost in working—the cost being from 4·48 pie to 3·45 pie for lifting 10,000 gallons of water 1 foot.

Then an "improved water lift," or single mhote somewhat similar to the first, but worked by bullocks, was tried. This raised 10,000 gallons of water 1 foot high for 3·18 pie. Burgess and Keys' original water lift was next tried—the lift was at 3·63 pie. By means of piccottahs, lifts were obtained at 4·76 pie, and by Norton's tube pump, with rotary motion, the lift was at 8·40 pie. Roorkee pump gave at 7·60 pie, and a double bucket piccottah gave at 3·33; while a single piccottah gave at 3·73.

At last the double mhote proved to be the most serviceable. I quote Mr. Robertson's account of it as given in his annual report of 1872–73:—

"This is one of the best water lifts that we possess. It was introduced on the experimental farm some time ago." * * "As in some districts the machine may not be known, or, if known, not recognized by the name under which I have noticed it, the following observations regarding its working and construction may be of use:—The water is raised by two leather buckets, similar to those in ordinary use in some parts of this Presidency; to each of these buckets is attached a rope which is fastened to a drum; one of these is coiled and the other uncoiled, as one bucket ascends the other descends; the drum is fixed on a rotating spindle, to which is fixed at right angles the draught bar to which the bullock is attached; the diameter and thickness of the drum varies with the depth of the well: as a general rule, for all ordinary lifts, the diameter of the drum may be equal to about one-fifth the number of feet that the water must be raised; the drum is placed about six feet above the ground, in order to allow the rope to pass over the head of the draught bullock; the spindle upon which the drum is placed is kept in its upright position by means of two beams, into which it is fixed, which cross each other at the middle, and are supported at the ends on posts placed opposite each other on the outer-side of the bullock patch. The bullock walks under the draught bar attached to a curved yoke, which turns on a swivel. In raising water the bullock travels round the upright spindle, thus turning the drum and winding one rope and unwinding the other. If the diameter of the drum is as suggested, 1½ circuits around the path will raise each bucket to the requisite height; the bullock is turned round, facing the opposite direction, while each bucket is being discharged; no longer time is required to do this than is needed for the bucket to discharge its contents." "The following may be accepted as a fair estimate of the capabilities of the machine as now ascertained:—

Cost per Day.

	Rs.	A.	P.
Hire for one bullock and driver for one day - - - - -	0	8	0
Interest and wear and tear at 10 per cent. per annum on the capital invested, say Rs. 100, charged over 300 working days - - - -	0	0	6
Cost of replacing buckets and ropes three times a year, say Rs. 90, charged over 300 working days -	0	4	9
Oil, &c. - - - - -	0	1	0
	0	14	3

"The cost per day is therefore annas 14, pies 3. When working at the ordinary speed, 90 buckets are raised per hour; each bucket contains 30 gallons when brought to the delivery spout; the height to which the water is raised varies from 20 to 24 feet; thus, 2,700 gallons of water are brought to the surface and discharged in one hour, or 24,300 gallons during an ordinary working day of nine hours, rather more over an acre of land than a rainfall of one inch. Taking 22 feet as the average height of the lift, it would appear that the machine raises about 27,000 gallons to this height for 1 rupee."*

"This water lift," Mr. Robertson continues "displaced one of the sort very common in this Presidency, sometimes known as the single mhote, that in which, when at work, the cattle must walk down an inclined plane as each bucket comes to the surface, and be backed up again to the mouth of the well as the bucket again descends. This machine, with a pair of cattle, raised only 12,600 gallons of water in a day, while the cattle were exceedingly hard worked in doing this; backing up an incline with a slope of about 45 degrees, about 40 times per hour, is a most effective way of rendering cattle worthless. The cost of working this lift was as follows:—

Cost per Day.

	Rs.	A.	P.
Hire for a pair of bullocks and driver for one day - - - -	1	0	0
Interest and wear and tear at 10 per cent. per annum on the capital invested, say Rs. 100, charged over 300 working days - -	0	0	6
Cost of replacing bucket and rope four times a year, say Rs. 60, charged over 300 working days -	0	3	2
Oil, &c. - - - - - -	0	0	4
	1	4	0

The cost, therefore, of raising 12,600 gallons by this lift was Rs. 1–4–0, or only 10,080 gallons for 1 Re., against 27,000 gallons for 1 Re., the cost of doing similar work by the improved machine.

This account was recorded by Mr. Robertson in 1872–73, and the calculations were based upon rates prevailing at Sydapet at the time. Subsequently, *i.e.*, towards the end of November 1875, Mr. Robertson having made a tour in the Coimbatore District, wrote as follows:—

"I was glad to see in the town of Coimbatore eight improved water lifts at work, all of the kind known as the 'Double Mhote;' they were made from a model supplied by the Sydapet Experimental Farm. I learn that there is every prospect that this improved water-lift will be adopted in this district. The experience gained with the lift by the Coimbatore municipality has been of the most satisfactory character; the lift raises, when worked by one bullock, as much water as was formerly raised by two of the ordinary water lifts, each worked by a pair of bullocks."

The following shows the cost at which these "Double Mhotes" were being worked in the Coimbatore District. It will be seen that the total daily cost is even cheaper than what has been shown to have been at Sydapet, thus:—

	Rs.	A.	P.
Hire of bullock - - - -	0	4	0
Hire of driver - - -	0	2	0
Hire of water distributer - -	0	1	6
Interest and wear and tear at 10 per cent. per annum on the capital invested, Rs. 150, charged over 250 working days in the year -	0	1	0
Cost of replacing the buckets and ropes three times a year, say Rs. 60, charged over 250 working days in the year - -	0	2	10
Oil, &c - - - - - -	0	0	6
	0	11	10

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* *Or calculating in the same way as for the other lifts, thus, as 22 feet: 1 foot:: 1 rupee: X, we have for answer 8·73 pies as the cost of lifting 27,000 gallons one foot high. Then continuing the calculation, as 27,000 : 10,000 gallons:: 8·73 pies: X, we have 3·23 pies as the cost of raising 10,000 gallons of* water one foot high.

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"The cost per day for working this machine is therefore, annas 11, pies 10. When working at the ordinary speed, 90 buckets are raised per hour, and as each bucket contains 30 gallons when at the point of delivery, the quantity of water raised per hour is 2,700 gallons, or, in a day of six working hours, the quantity raised is 16,200 gallons. For an expenditure of one rupee, 21,904 gallons of water can be raised to the height of 20 feet by the improved lift, against 11,260 gallons raised for one rupee by the old fashioned lift.

To irrigate an acre of land with the quantity of water generally used, the cost will be, by means of the old fashioned water lift, Rs. 2–1–3 or, by the improved water lift, Rs. 1–1–1.

A crop of ragi, cumboo, or cholum, when grown with the aid of well water, receives from 10 to 12 waterings; the cost then of the irrigation water for an area of one of these crops will be, when the unimproved lift is used, Rs. 22–13–9 or, when the improved lift is used, Rs. 11–11–11; thus showing a saving of about 11 rupees per acre; and the saving will be greater in the case of many other of the crops raised with water from wells, from the greater quantity of water required."

Taking the saving of Rs. 11 per acre, if this saving is really possible, then a district containing 150,000 acres of land irrigated from wells would realize a saving of at least two million of rupees per annum. Besides this direct advantage, Mr. Robertson recounts other indirect but real advantages which the ryots will gain. "Water, manure, more cattle labour," he says, "and more manual labour, are imperatively "demanded by 90 per cent. of the cultivated area. "By adopting the new water lift, the ryot will be "able to water double the area he was previously "able to irrigate; if he prefers *not* to extend the "irrigated area of his holding, he will have cattle "labour and manual labour set free for collecting "and bringing manure to his land, and for the more "thorough tillage of his soil, &c., &c."

I said above that the soil of the Sydapet Experimental Farm being sandy and dry, manure and irrigation were to be the chief agents to be relied on in conducting agricultural experiments. I have quoted freely from Mr. Robertson's reports so far as irrigation from wells is concerned, because information was especially required on the working of the "Double Mhote," or improved water lift.

The other means of irrigation which Mr. Robertson took up and made use of, were, irrigation from the Adyar River and the Chembrambankam Tank. Channels were run through the estate; these channels were not built up on embankments to let the water flow, as this caused a waste of water from soakage, but they were dug out about 3 feet below the surface of the water in the source of supply, and the water thus flowed in by gravitation to the portion of the farm on which it was needed, where it was lifted for use. The height of the lift varied in different parts of the channel from 9 to 12 feet. Some difficulty was at first experienced in protecting the banks from cutting during heavy rains, but by planting them with guinea-grass this difficulty was overcome.

We now come to the subject of the manures used in improving the composition of the soils. This subject I would notice, after having given an account of the successful experiments carried out in producing crops, because then it would be sufficient to notice only such of the manures which produced the best results.

The following experiments, picked out from a report dated November 1871, show in a condensed form, the results achieved when the soils were but poor and sandy, and had not had the benefit of the improvements subsequently wrought:—

Grain Crops.

Name of Crops.	When Sown.	Seed Sown per Acre.	Value of Grain per Rupee.	When Harvested.	Average Yield per Acre.		Remarks.	Average Ordinary Yield per Acre.
					Grain.	Straw.		
		Lbs.	Lbs.		Lbs.	Lbs.		
Raggi - - - -	April -	25	50	August -	940	4,000	Country grain.	
Chinese sugar-cane -	October -	15	25	January -	1,090	17,000	Seed imported from Australia; valuable crop for loamy soil.	
Chumba paddy - -	„ -	20	65	„ -	2,200	3,500	Country grain; useful wet crop.	
Carolina „ - -	August -	24	—	December	2,500	4,000	Imported from America; valuable wet crop.	
Bangalore maize - -	October -	18	40	January -	770	3,500	Useful dry crop for inferior cultivation.	
Queensland „ - -	„ -	25	30	„ -	1,550	5,000	Imported from Australia; very valuable dry crop for high cultivation.	
Red cholum - -	„ -	24	40	February	500	4,000	Country grain; useful dry crop for loamy soil.	
Yellow cholum - -	„	24	45	„ -	800	5,000	Country grain; valuable dry crop for loamy and clay soils.	
Cumboo - - -	June -	12	45	September	700	7,000	Country grain; useful dry crop for summer sowing on sandy soils.	

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GREEN FODDER CROPS.

Name of Crops.	When Sown.	Seed Sown per Acre.	Value of Grain per Rupee.	When Harvested.	Average Yield in Lbs. per Acre. Green Fodder.	Remarks.	Average Ordinary Yield per Acre.
		Lbs.	Lbs.				
Cumboo - - -	January -	12	—	August -	15,000 -	Useful fodder crop for hot season for dry cultivation; should be cut before flower appears.	
Yellow cholum, *irrigated* -	December	24	—	At different times.	50,000 in 5 cuttings.	5 cuttings in 11 months; is a most valuable fodder producer, and farm stock of all sorts eat the fodder readily.	
Yellow cholum, *dry cultivation.*	June -	24	—	Do. -	17,000 in 3 cuttings.	3 cuttings in 8 months; should be cut for fodder (under either wet or dry cultivation) when about two-thirds grown.	
Chinese sugar-cane -	October -	15	—	December	20,000 -	Seed imported from Australia; is a very valuable fodder producer for loamy soils; is very rich in saccharine matter; and is much relished by stock of all kinds.	

Pulse Seeds.

					Pulse, Lbs.	Straw.		
Green gram - -	October -	24	—	February	480	—	A country grain; thrives well on calcarious loamy soils; works well in rotation after a cereal crop.	
Horse gram - -	October -	24	—	March -	450	1,800	An indigenous crop; thrives with a very moderate rainfall.	

Oil Seeds.

					Seeds.		
Gingelly - - -	June -	8	—	September	800 lbs.	An indigenous crop; thrives with a moderate rainfall.	
Castor-oil - - -	July -	8	—	March -	1,200 „	An indigenous crop; well suited as the first crop for newly reclaimed ground.	

No account is given of either the mode of cultivation adopted or the manure used in each case. But the following extract may give an idea of the manural substances generally used:—"Our chief reliance," Mr. Robertson said, "is on our box manure, that is, "the manure made in the loose boxes by working and "fattening cattle fed on oil cake and green fodder. "Besides this, we use a considerable quantity of the "ashes of cow-dung and wood, which we obtain in "the neighbouring villages and tile yards, the former "is rich in phosphates and alkaline salts, and the "latter in potash. Mixed in equal parts they form "an excellent top dressing for cereal crops. * * * "We also get a quantity of blood and offal from the "slaughter-house, which, when made into a compost "with ashes, makes excellent manure. Our auxiliary "manures are carbonate of lime, sulphate of lime, "saltpetre, bone-dust, animal charcoal, &c. Lime, "both from stone and shells, is costly in this district, "*i.e.*, Chingleput District."

"I have this year used saltpetre (nitrate of potash) "with great success."

The following experiment on Chinese sugar-cane seems to be an instance in point. The total area of the piece of land selected was 3,484 yards. This was divided into 12 equal parts and was cultivated as for cholum: the seed used weighed 10 pounds:—

No. of Plots Sown.	Area of Plots in Square Yards.	Manure Used.	Value of Manure.	Yield in Lbs.	
				Grain.	Straw.
			Rs.		
1	268	13 lbs. of guano - -	1	89¼	1,045
2	268	152 „ of carbonate of lime	1	106¼	1,302
3	268	10 „ of saltpetre - -	1	123	1,440
4	268	Nothing - - - -	1	54¼	849
5	268	37 lbs. of bone dust -	1	106	1,285
6	268	112 „ of sulphate of lime	1	102	1,280
7	268	13 „ of guano - -	1	91	1,083
8	268	152 „ of carbonate of lime	1	93½	1,125
9	268	10 „ of saltpetre - -	1	97	1,196
10	268	Nothing - - - -	1	65¾	968
11	268	37 lbs. of bone - -	1	110½	1,372
12	268	112 „ of sulphate of lime -	1	91¼	1,082½

AVERAGE RESULTS.

Manure.	Yield.		Increase Due to Manure.	
	Grain.	Straw.	Grain.	Straw.
	Lbs.	Lbs.	Lbs.	Lbs.
Unmanured - - -	60	908	—	—
13 lbs. of guano - -	90	1,064	30	156
152 „ of carbonate of lime -	99	1,237	39	329
10 „ of saltpetre - -	110	1,318	51	410
37 „ of bone dust - -	108	1,328	48	420
112 „ of sulphate of lime -	96	1,181	36	173

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"The saltpetre, nitrate of potash, an indigenous product, used in this instance, was bought in Madras at the rate of 10 lbs. per rupee. An expenditure of 18 rupees per acre on this manure not only nearly doubled the crop, but after repaying its cost, left an additional farmer's profit of nearly 30 rupees per acre. This salt is best applied as a top dressing when the crop is a few inches above the ground; 100 pounds or at most 150 pounds per acre is enough to apply; it should always be mixed with an equal volume of sand or some similar material, in order that it may be more regularly distributed over the ground. Carbonate of lime (chunam) not only repaid an expenditure of 18 rupees, but gave a profit of nearly 20 rupees. Sulphate of lime (gypsum) not only repaid its original cost, but left an additional profit of nearly 15 rupees per acre. The guano repaid its cost, but only left a profit of about 6 rupees per acre.

The following examples of dry land cropping give an idea of the capabilities of sandy soils, such as those of the Sydapet Farm, when properly treated:—

FIELD No. 18, East side.

Date of Sowing.	Date of Reaping.	Nature of Crop.
3rd August 1869 -	13th October 1869 -	Horse gram cut for fodder.
15th October " - -	6th January 1870 -	Bangalore maize.
18th January 1870 -	12th March " -	Horse gram cut for fodder.
16th June " -	23rd September 1870	Gingelly.
15th October " -	3rd February "	Yellow cholum.
3rd March 1871 -	—	Tobacco.

This shows that one field bore six crops in 21 months. The following is another example, and shows besides the yield per acre:—

FIELD No. 18, West side.

Date of sowing.	Date of Reaping.	Nature of Crop.	YIELD PER ACRE.	
			Straw.	Grain.
			Lbs.	Lbs.
2nd August 1869 -	13th October 1869	Gram fodder -	7,582	—
25th October " -	8th February 1870	Queensland maize.	7,543	836
14th June 1870 -	7th September "	Cumboo - -	6,000	668
10th October " -	25th January 1871	Sorghum -	21,096	1,692
8th February 1871	—	Tobacco - -	—	—
		Total -	42,221	3,196

In his annual report for 1870–71, Mr. Robertson recorded the following experiments:—

Names of Crops.	Date of Sowing.	Extent Sown and Seed used.	Date of Reaping.	YIELD IN LBS.		Remarks.
				Grain.	Straw.	
Chumba paddy	October -	⅕ acre with 9 lbs. seed.	January -	409 - -	—	Manured with 12 loads of yercum plants worked into the puddle.
		⅕ acre with 9 lbs.	February -	375 - -	—	Manured with 10 loads of fold-yard fodder worked into the puddle.
Green gram -	" -	½ acre with 12 lbs.	" -	240 - -	—	Market value 18 lbs. per rupee; useful plant in a rotation.
Gingelly -	June - -	4,356 yards with 5½ lbs.	September -	762 - -	—	
Castor-oil plant	July - -	⅖ acre with 2¾ lbs.	March. Still yielding.	279 (clean seed).	—	This was the yield up to the 31st March, and the plants were still yielding.
Carolina paddy	September -	2,027 yards -	December -	960 - -	—	Grain produced was very good, and received 1st and 2nd prizes at the Agricultural and Horticultural Society's show in February.
Do. -	" -	2,650 " -	January -	1,120 - -	—	
Red cholum -	12th October -	28 lbs. - -	14th February	270 - -	—	Seed produced was very good; return of straw large; crop was tall and closely packed upon the ground.
Yellow cholum	October -	"Large area"	" " -	3,000 - -	—	Quite a success; seed obtained was good, and was held out for distribution. Besides, a large amount of fodder was produced which was stored up for the dry season.
Australian maize.	5th October -	25 lbs. - -	29th December	1,112 cobs -	2,225 - -	This was the Richmond variety. Weather being excessively dry, plants ripened prematurely, and yield was thereby greatly lessened.
Do. -	17th September	25 " -	27th January	2,702 " -	—	This was the Mackey maize. The cobs were larger than any variety till then introduced; grain also was large; straw bulky; crop stood 9 or 10 feet high. This is a good variety and well worth general cultivation.

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Names of Crops.	Date of Sowing.	Extent Sown and Seed used.	Date of Reaping.	YIELD IN LBS.		Remarks.
				Grain.	Straw.	
Cumboo -	June - -	2½ acres with 25 lbs. of seed.	6th September	668 per acre -	18,000 per acre fodder.	A portion was first cut for fodder, and that produced 18,000 lbs. per acre of fodder. The remainder was allowed to seed, and yielded the 668 lbs. of grain per acre. Cumboo was found a very valuable crop, as it afforded an abundant supply of green fodder during the hot months of June, July, and August. Cattle ate it freely and throve very satisfactorily upon it.

"Amongst the crops experimented with as fodder producers were—yellow cholum (holcus sorghum), Chinese sugar-cane (sorghum saccharatum), cumboo (penicillaria spicata), horse gram (dolicus uniflorus), and common paddy."

The general results of these experiments were summarized thus:

Crops.	Weight per Acre of Green Fodder.	Average Number of Days Required to Produce a Crop.
	Lbs.	Days.
Yellow cholum (dry) -	10,000	90
Ditto (wet) -	12,000	60
Chinese sugar-cane (dry) -	20,000	80
Cumboo (dry) - -	15,000	75
Horse gram (dry) - -	7,000	70
Paddy (wet) - - -	8,000	65

The experiments having thus advanced, Mr. Robertson noted the effects produced on the soils by the cultivation they had undergone:—

"There is a marked change," he said, "in the appearance of our soils. Soils which, when reclaimed only two years ago, could scarcely rear a blade of grass, and consisted almost entirely of blowing sands, might now, as far as appearance goes, be classed as fair arable soils. Much of this is certainly due to heavy dressings of tank mud and burnt earth; still I think much more is due to deep cultivation and the liberal use of fold-yard manure. * * * *

"Our plan has been to apply a slight dressing of manure to *each* crop, and to crop the land as frequently as possible with green crops. These crops, being cut in the green state, leave a great quantity of roots, &c., in the ground, and add greatly to the quantity of organic matter in the soil. True, we might have effected this more quickly by ploughing in the green crop; but the stock-feeder on land like this has seldom such a superfluity of green food as to justify this precedure.

"Another improvement, which has greatly benefited our land, is the open drains which have been laid out in different directions for carrying off surplus water during the rains. The more I see of dry land farming in this country, the more am I convinced that our crops suffer more from *too much* water than from *too little*. Water in a stagnant condition is more injurious than a drought.

"Deep cultivation with proper manuring has greatly increased the capillary action and absorptive powers of our soil. Crops on this farm continue fresh and green long after the crops on neighbouring farms are scorched and dried."

There was still another improvement which Mr. Robertson introduced, and although an account of it is given in a subsequent report,* I think it might appropriately be referred to here; it relates to *sub-soil* drainage in connection with irrigation. Mr. Robertson wrote as follows:—

"Before I had been 12 months in this country, I had become fully convinced that in the districts over which my observations extended, agriculture suffered far more from an excess of water than from a deficiency of water; and the experience I have since had in conducting the operations of the Sydapet farms, and the observations I have made during my tours over the Presidency fully confirm the opinions then formed. I have refrained until now from bringing this forward in a prominent way, from a desire to gain as much information as possible regarding the influence of seasons of various character * * *. The matter is one which needs to be examined from various stand-points, and one that well deserves our most serious attention. Experiments should be instituted under all the various conditions met with in the cultivation of arable land in this country, and the results should be carefully recorded and compared. I have just begun a small experiment in sub-soil drainage, but it was commenced so recently that I can now do little more than describe the preliminary operations and indicate the direction in which it seeks for information. The field selected for the experiment measures 3·80 acres; it is divided by a water channel nearly in two equal sized portions. The soil is a stiffish loam, of a sour soapy character, resting on a sub-soil of a similar nature, and it has been almost quite unproductive during the five years I have been acquainted with it. The land was formerly (before it became the property of Government) used for growing paddy, under the repeated cultivation of which it has become injured. When heavily seeded, there was generally a fair covering of plant up to the time the crop was about one-third grown, and the plants looked well as long as their roots were confined to the few inches of the healthy surface soil; but after this, when the roots got into the sour soil, there was little further growth, the plants became yellow and stunted, and gradually red from the attacks of the fungoid disease 'rust,' and but an exceedingly small yield of inferior grain was obtained. It mattered not what crop was tried, the result was generally the same. It is intended that one portion of the field shall be drained with stone drains, and the other portion with pipe drains, each portion being separately provided with a main drain and an outfall. On both plots the parallel drains will be 3½ feet deep, and the main drain 4 feet deep, while the distance between each parallel drain will be 24 feet. The cutting of the parallel drain has been let to a contractor at 3½ rupees per 200 running yards; he merely makes the cutting and throws the earth on the sides of the drain."

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* That for the year 1872-73.

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I will now go back to the proceedings of 1871–72. In his report for this year, Mr. Robertson gave his conclusions on experiments he had been making for the preceding four years in view to discover whether guinea-grass could be grown without being irrigated. He said his trials proved a complete success, the area of land under this valuable fodder plant had been considerably extended, and the better he became acquainted with the grass the more he valued it. He had very fine crops which had never been irrigated, and some of the best results he obtained in fattening stock were obtained with guinea-grass.

"The fodder can be used for all kinds of stock; it seems to disturb the digestive organs of some animals, but this is only temporary. I have fed cattle and sheep on it *exclusively* for *months*, not only without ill effects, but with the most satisfactory results. I have found our guinea-grass field a capital place in which to graze our working cattle during the hot season, and for the ewes with young lambs I could scarcely desire a better pasture. It produces such an abundant flow of milk in the ewes, without, what is common in such cases, disturbing the health of either mother or lamb."

Chinese sugar-cane, which had been introduced from Sydney in the early part of 1870, had established itself as one of the regular cold-weather crops. A large quantity of seed had been distributed over the country, and satisfactory results were obtained in most instances. From Bangalore reports were very encouraging, and the crop seemed specially suited to the more temperate climate of Mysore. The practice adopted in sowing is thus described:—

"The land is first ploughed, scarified, and weeded, and then the manure is broad-casted over it surface. This is then ploughed in, and the land is harrowed along the lines the plough travelled (not across, as the harrow would pull up the manure). It is then rolled, and the seed is sown with the seed drill (the country bamboo drill answers admirably) at distances varying from 12 inches to 18 inches, according to the richness of the soil, at the rate of from 12 to 15 pounds per acre."

Country paddy was tried as a fodder crop. It was cut when the plants were in the short blade, just before the ear appeared. The following were the results of three experiments:—

Grain.	Number of Days between Sowing and Harvesting.	Seed Sown.	Area of Plot.	Weight of Fodder.	Weight of Fodder per Acre.
		Lbs.	Sq. Yds.	Lbs.	Lbs.
Car paddy - -	120	30	1,320	5,348	19,609
Do. - -	132	25	1,056	4,508	20,662
Do. - - -	135	15	630	2,016	15,488

The cost per acre in producing the results was Rs. 20 in all, and the fodder was therefore produced at 929 lbs. per Re. 1, or at about Rs. 2-6-7 per ton.

The nutritive value of this fodder was tried against ordinary grass supplied by grass-cutters, and the following was the result:—

	Quantity given as forage with 4 lbs. of oil cake.	Weighings of the Cattle.										Remarks.
		1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	
	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	
1 pair of working cattle -	30	784	826	836	846	850	860	854	882	876	870	Animal fed on paddy fodder.
	30	870	870	840	835	842	868	852	864	861	859	Animal fed on grass.

Some cotton cultivation was also tried, although the soils were anything but cotton soils. The following table condenses the information given as to the results:—

When Sown and How.	Quantity and Extent Sown.	Produce.	Remarks.
26th October in drills 6 feet apart. It was hoed by manual and bullock labour.	6 lbs. of seed per acre in 5 acres.	1,766 lbs. of seed cotton, or 353 lbs. per acre.	This was in addition to a crop of maize which was sown in alternate rows with the cotton, and was harvested before the cotton had begun to put out its lateral branches.

New Orleans cotton and Australian maize were also tried together, thus:—

When Sown.	Extent Sown.	Produce per Acre.	Remarks.
In September.	5,600 square yards.	189 lbs. clean cotton. 472 lbs. cotton seed. 1,793 lbs. of cobs. 1,043 lbs. of cob stalks, skins, &c. 3,889 lbs. of straw.	Land was well ploughed, then harrowed, rolled, weeded, &c., afterwards ridged at distances of 30 inches apart, and farm-yard manure was applied at 8 tons per acre; maize and cotton were sown along the tops of the ridges in alternate rows. After the crop was a few inches high, a showery morning was selected, and the top dressing was broad-casted over the surface of the drills and hoed in.

The quality of the staple is not reported on, but we will see an account on this subject in a subsequent report.

Meantime we pass on to the next annual report, the one for the year 1872–73, and find that Mr. Robertson, who had apparently set his heart to the production of fodder, recorded in a general way the result of his experiments on this branch of agriculture. He said that a large quantity of fodder had been produced, chiefly cholum and horse gram, and the produce proved large enough to enable the farm to support its own large stock, besides enabling it to sell 80,000 lbs. of fodder during the year to the Commissariat Department for feeding camels, elephants, &c., for which use gram fodder was generally preferred.

The elephant grass (with seeds like the cumboo seed), which seemed to be a large producer and to possess some merits as a fodder, was grown on a plot of land measuring 624 square yards. The following were the results:—

No. of times Ploughed.	Quantity of Manure Used.	Date Sown.	Quantity of Seed Sown.	Date when Germinated.	Number of times Weeded.	Number of Waterings.	Date of First Cutting.	Weight of First Cutting.	Average Height.	Date of Second Cutting.	Weight of Second Cutting.
Ploughed in puddle 3 times.	About 16 cart-loads of fold-yard manure.	14th March 1873.	9 lbs. of seed, broad-cast.	20th March	4 times -	25	5th June 1873.	Lbs. 1,576	3 feet -	25th September 1873.	Lbs. 1,132

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Then came the cultivation of sugar-cane. A plot of land of about 2,000 square yards had been planted with the cane in February 1872, and the land had been manured with blood manure only, the preparation made on the farm consisting of slaughter-house refuse and village ashes. The cane had been planted out in lines about 3½ feet apart, and there were 35 lines. In November 1872, an average row of canes was cut down; the canes weighed 1,162 lbs. and the toppings 392 lbs., or together 1,554 lbs. This, multiplied by 35 (the number of rows of cane on the plot), would give a total weight of fodder amounting to 54,390 lbs.

In his annual report for 1873–74, Mr. Robertson, after having completed the experiments already summarized, on the cultivation of New Orleans cotton, recorded his conclusive opinion upon the success of this cultivation:—

"My first experiments were made on a small scale; the results afforded were very encouraging. I repeated the experiments again and again, each time on a larger scale, and now cotton is one of the ordinary crops of this farm. The variety I prefer is the New Orleans; it is especially suited for high cultivation, to which it has long been subjected; a dressing of manure that would be necessary to render our inferior soils fit for producing cotton would cause plants of the indigenous variety to run to stem and leaf, instead of increasing the yield; whereas the yield of New Orleans plant, under similar circumstances, would be largely increased. On the experimental farm, crops that have yielded 200 lbs. and upwards of clean cotton per acre have repeatedly been produced, while the average produce in the cotton districts is only 75 lbs. of clean cotton per acre.

Three bales of the cotton produced* were sent to London to be valued and reported upon. Messrs. Walker and Company, of London, reported it to be of a useful description of Salem character, ginned, fair colour, silky, but rather weak staple, and worth about 6⅝*d.* per lb. The following were the rates at the time for other varieties of cotton:—

Tinnevelly - -	6½*d.*	per lb.
Dhollera - - -	6$\frac{1}{16}$	,,
Western - - -	6	,,
Coconada - - -	5⅞	,,
Bengal - - -	3⅞	,,
Rangoon - - -	4	,,
American cotton, New Orleans - -	8½	,,

But since the date the above-mentioned sample was produced, there was, Mr. Robertson found, "a considerable improvement in the quality of the cotton produced on the farm." It was both longer in the staple, and more soft and silky. The following results show the quantity of clean cotton obtained in 1873–74 from the New Orleans seed cotton:—

Date Ginned.	Seed Cotton Ginned.	Clean Cotton Obtained.	Yield of Clean Cotton per 100 lbs. of Seed Cotton.
	Lbs.	Lbs.	Lbs.
August 10th - -	229	73	31·88
August 28th - -	409	130	31·78

The average yield of 31·83 lbs. of clean cotton for every 100 lbs. of seed cotton seemed to Mr. Robertson to be very satisfactory, seeing that the best indigenous cotton did not yield more than 25 lbs. of clean cotton for every 100 lbs. of seed cotton.

The Egyptian cotton plants were tried, but they proved to be a more expensive crop to grow than the New Orleans.

An experiment was tried in raising New Orleans cotton on two plots of land, which received the benefit of sub-soil drainage. Before noticing the result of the experiments I shall quote Mr. Robertson's account of drainage:—

"The field selected for the experiment measured nearly four acres; it is divided in two nearly equal sized parts by an open channel. One of these portions, which I shall refer to as plot (*a*), measures 8,800 square yards; the other portion, plot (*b*), measures 8,742 square yards. The whole of the field has been drained in one way, under what is known as the 'gridiron' system. The ordinary drains are 3½ feet deep, and are placed 24 feet apart. Each plot is provided with one main drain which runs along at right angles to the line of the parallel drains, and into which the whole of the water is discharged; the outlet of this drain is formed of brick built in lime with an iron gate over the vent to prevent rats, &c. going up the pipes. The depth of the main drain is four feet. Stone drains have been laid down over the whole of plot (*a*), while plot (*b*) has been drained by means of pipe drains."

* * * * * *

"As far as can be judged from the short time these drainage experiments have been in operation, I consider that pipes will be far better suited than stones for use in draining in this country. An important advantage attending the use of pipes is that land so drained can, during a drought, readily be sub-soil irrigated by passing the irrigation water into them, sluices being put in the drains at suitable places, to prevent the water passing out. By sub-soil irrigation the water can be far more evenly distributed; no surface ground is required for water channels, and there is less waste by evaporation. By thus combining drainage with irrigation, the agriculturist will be less dependent on the character of the seasons than at present."

I shall now give the details of the cropping of the two plots thus drained.

Plot (*a*).—Drained by stone drains. The soil, after being thoroughly worked and cleaned, was ridged and 36 cart-loads of blood manure (a compost formed of ashes and the refuse of the slaughter-house) were then spread between the drills. The ridges were next split by the plough, one half falling over the manure on either side, thus forming new ridges with the manure beneath; these ridges were next consolidated by the chain harrows when the land was fit to receive the seed. On the 17th September the seed was sown on the ridges, which were about 30 inches apart. A line of cotton was sown alternately with a line of maize throughout the whole plot. The quantity of seed sown was—

Maize, 8½ pounds.
Cotton, 8½ pounds.

During the growth of the crop the land was ploughed twice and hand-hoed three times. The maize matured and was ready for gathering in the middle of December. The cotton crop was longer in coming into bearing, and as the weather was so exceedingly dry, several months passed over before the whole crop was gathered. The maize yielded 4,147 cobs; and from the cotton plants 299½ lbs. of seed cotton were collected. When dry, four of these

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* *Vide* an account of the cultivation on page 12.

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cobs on the average yielded one pound of clean maize, this would give a total produce of 1,036 lbs. of clean maize; of the seed cotton 100 pounds yielded on the average 31½ pounds of clean cotton, or, say that the total produce was 94·30 lbs. of clean cotton. Besides this, the straw and the cob stalks, skins, &c., were estimated to weigh 2,956 lbs. and 793 lbs. respectively.

Plot (*b*).—Drained by two-inch pipe drains. The soil was prepared in the same way as the soil of plot (*a*), and about 10½ tons of blood manure and 54 parahs of lime were applied to the plot. On the 4th September the plot was sown, 11 lbs. of maize and 9 lbs. of cotton seed sufficed for sowing the whole plot in the same way as described in referring to the sowing of plot (*a*). Two ploughings and four hand-hoeings were all the after-cultivations performed. The maize *did not mature until the beginning of January; the cotton was not all gathered until several months after. The maize yielded 5,728 cobs, and the cotton yielded 404½ pounds of seed cotton, or clean maize 1,432 lbs., clean cotton 127·41 lbs. The straw, besides, weighed* 4,112 lbs., and the cob stalks, skins, &c., weighed 1,104 lbs.

Mr. Robertson remarked :—

“Satisfactory as are these results, they do not fully exhibit the benefits in this instance gained by sub-soil draining, for it must be remembered that before the drainage was performed the land was almost hopelessly unproductive, having been rendered so by swamp cultivation. The stoppage in the stone drains in plot (*a*) during the latter growth of the crop undoubtedly lessened the return that would otherwise have been obtained.

“With further experience I feel sure that pipes will be found much more suited than stones for use in sub-soil draining in this part of India.

“Throughout the long drought which was experienced during the year under review the cotton on the pipe-drained land was always green and fresh, while *that growing on the undrained soils was withered and much blighted.*”

The next successful experiment we find recorded is the cultivation of shamay (panicum miliare) of tall growth, somewhat resembling the elephant grass. This was cultivated as a fodder crop, and the following table condenses the results :—

Extent Sown.	Quantity Sown.	Date of Sowing.	Dates of Cutting.	Yield of 1st and 2nd Cuttings.	REMARKS.
744 square *yards.*	10 lbs. of *seed.*	2nd Aug.	25th October, when the plants were coming into ear. 18th December	4,575 lbs. of fodder which, when dried and made into hay and cured, weighed 1,411 lbs. 2,673 lbs., which, when dried, yielded 925 lbs. of hay.	Total return thus obtained from the plot during 4 months from date of sowing to date of second cutting was 7,248 lbs. of fodder, which gave 2,336 lbs. of hay = per acre to 47,151 lbs. of fodder or 15,197 lbs. of hay.

The mode of cultivation followed in the above experiment was two ploughings, two harrowings, two weedings, seven waterings, and four cart-loads of fold-yard manure.

In 1874–75 an experiment was made with maize with a view to ascertain whether seed sown out of the usual season (September), and treated as a wet instead of as a dry crop, would give any out-turn. This experiment, if successful, would prove of some importance, as maize from its tall upright growth was especially liable to injury from the effects of high winds which generally prevail during the monsoon, which is the usual time for maize. A plot of land measuring 1,950 square yards was on the 15th January sown with 14½ lbs. of maize seed. The soil was a free sandy loam; it was twice ploughed, twice harrowed, manured with 1,500 lbs. of oil cake, and 14 cart-loads of ashes, and ridged. During the growth of the crop the land was five times irrigated, and once hand-hoed. The plants grew so luxuriantly that it was found necessary to thin out a considerable number; the weight of fodder thus obtained was 1,134 lbs. The remainder of the plants matured three months after sowing and produced 1,738 cobs and 1,324 lbs. of dry straw.

With regard to yellow cholum (sorghum vulgare), Mr. Robertson wrote as follows :—

“I have frequently drawn attention to this valuable fodder crop, and I would again do so, as its value is yet but little appreciated by those who might benefit most largely by cultivating it. Most of the live stock on the Sydapet farms are fed on cholum fodder throughout a greater part of the year; the crop is therefore cultivated on these farms on rather an extensive scale. The following details refer to a crop which was produced on a plot of ground, measuring 2,494 square yards; the soil was a stiffish loam; before being sown it was prepared in the following way :—Once ploughed, once harrowed and ridged, then manured with 10 cart-loads of farm-yard manure, and again ridged over the manure, the ridges thus formed being about 24 inches apart. The seed was sown on these ridges on the 2nd of June; it germinated well and produced strong and healthy plants. The crop during its growth was hoed by hand twice, and was 16 times irrigated. The crop, three months after sowing, was cut down for use as fodder, when its total weight was found to be 4 tons 10 cwts. and 50 lbs., equal to 8 tons 15 cwts. 59 lbs. per acre, a quantity sufficient to support two ordinary milch cows during a year.

“We have occasionally produced much heavier crops than this; thus the plants growing on 75 square yards of a plot sown with yellow cholum were found to weigh 664 lbs., which is equal to a yield of 19 tons 2 cwts., and 66 pounds per acre. This large yield was obtained only on a portion of the ground, the remainder of the crop not being so good; but the result shows what it is possible to achieve in the production of cholum fodder. This large return was obtained from plants only nine weeks old.”

Guinea-grass, the cultivation of which already proved a success, was again tried this year. A plot of land, measuring 4·77 acres, was, on the 28th November last, planted with the grass; the soil was a sandy loam of rather a stiffer character than the prevailing soils of this farm. After three ploughings, the land was manured with 4,000 lbs. of cotton seed, the vitality of which had been previously destroyed; the soil was then raised in parallel ridges about 9 inches in height and 2 feet apart; and the plants were put in on these ridges at every 2 feet, a wet day being selected for planting. The plants, with which the ground was planted, were removed from tussacks of this grass growing in another field. No irrigation water whatever was applied to the crops, either at the time of planting or subsequently, “and the rainfall “moreover, was unusually light during the three last “months of the experiment.”

The first cutting was obtained in February, and the yield was 3 tons and 56 lbs.; another cutting was obtained in March which weighed 2 tons and 20 lbs.; and there was at the end of the month another crop of about the same weight ready for cutting.

In 1875–76 an experiment was made to test the produce of yellow cholum by means of three modes

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of cultivation ; 1st, with farm-yard manure ; 2nd, with ashes ; and 3rd, without any manure. A piece of land measuring 2,427 square yards, which had previously been ploughed, was divided into three equal-sized plots, and each plot was treated as above. The details of the cultivation were as follows :—

—	Plot No. 1.		Plot No. 2.		Plot No. 3.	
General nature of soil	Sandy loam		Sandy loam		Sandy loam.	
Area of land sown	809 square yards		809 square yards		809 square yards.	
Cultivation of soil before sowing	Ploughed and ridged		Ploughed and ridged		Ploughed and ridged.	
Kind and quantity of manure used	3,150 lbs. farm-yard manure		131 lbs. of ashes of bratties		Not manured.	
Pounds of seed sown	20 lbs. of yellow cholum		20 lbs. of yellow cholum		20 lbs. of yellow cholum.	
Date of sowing	8th April 1876		8th April 1876		8th April 1876.	
Date of appearance of plants above ground.	13th „ „		13th „ „		13th „ „	
Cultivation during growth of crop	Hand-hoed		Hand-hoed		Hand-hoed.	
	Wet Days.	Inches.	Wet Days.	Inches.	Wet Days.	Inches.
Rainfall during growth of crop	25	8·83	25	8·83	25	8·83
Date of first cutting	22nd June 1876.		23rd June 1876.		24th June 1876.	
	Per Plot.	Per Acre.	Per Plot.	Per Acre.	Per Plot.	Per Acre.
Weight of fodder from first cutting	4,058 lbs.	10·826 tons	4,368 lbs.	11·684 tons	3,140 lbs.	8·578 tons
Date of second cutting	23rd August 1876.		23rd August 1876.		23rd August 1876.	
Weight of fodder from second cutting.	1,680 lbs.	4·4825 tons	1,176 lbs.	3·037 tons	896 lbs.	2·197 tons
Weight of fodder from both cuttings.	5,738 „	15·3085 „	5,544 „	14·721 „	4,036 „	10·775 „

The experiments could not be continued further, as the land on which the crops were growing was required to facilitate the carrying out of certain estate improvements.

Experiments were also made with seeds received from Australia ; these consisted of Chinese sugar-cane, planters' friend, maize of three varieties, prairie grass, buffalo grass, &c. Most of these seeds were sown on the experimental farm for producing seed for distribution. Some of the crops raised from them were very good, and a large quantity of excellent seed was obtained, thus :—

Names of Crops.	Nature and Extent of Land Sown.	Manure Used.	Pounds of Seed Sown.	Dates of Sowing and Germination.	Number of Wet Days and Inches of Rainfall.	Date of Harvesting.	WEIGHT OF PRODUCE.		REMARKS.
							Of Grain when fit for Market.	Of Straw when Dried.	
			Lbs.						
Chinese sugar-cane.	Sandy loam, 6,294 sq. yards.	35 cart-loads of farm-yard manure, and 20 lbs. of guano spread uniformly in the furrows between the ridges.	14	7th Oct. 12th „	27 days, 21·31 inches.	20th Jan. 1876.	1,468 lbs.	11,648 lbs.	Land before sowing twice ploughed, harrowed and ridged, and again ridged by splitting the ridges over the manure. During growth of crop twice hand-hoed.
Planters' friend	Sandy loam, 3,654 sq. yards.	24 cart-loads of farm-yard manure.	10	16th Oct. 21st „	22 days, 19·57 inches.	3rd Feb. 1876.	992 „	5,040 „	Same as above, plus once hoed by cattle during growth of crop.
Maize (early American).	Sandy loam, 2·83 acres.	42 loads of farm-yard manure.	18	21st Sept. —	31 days, 24· inches.	29th Dec. 1876.	7,390 cobs	5,824 „	Same as above, but during growth of crop twice hand-hoed.
Maize (yellow flint).	Sandy loam, 1½ acres.	(Not stated)	19	22nd Sept. 25th „	31 days, 24· inches.	5th Jan. 1876.	4,050 „	—	Land before sowing was ploughed, harrowed, and ridged. After growth of crop twice hand-hoed.
Sumba paddy	A stiff loam, ·88 acres.	6 cart-loads of yerpum and eratom plants.	—	14th Oct. 1875. —	—	10th Feb. 1876.	1,200 lbs. or 1,364 lbs. per acre.	—	Land before sowing was ploughed and levelled.
Ditto	A stiff loam, ·52 acres.	6 cart-loads of yerpum and eratom plants.	—	29th Sept. 1875. —	—	20th Jan. 1876.	1,127 lbs., or 2,167 lbs. per acre.	2,128 lbs., or 4,092 lbs. per acre.	Land before sowing was ploughed and levelled.
Ditto	A stiff loam, ·52 acres.	2 cart-loads of yerpum and eratom plants.	—	28th Sept. 1875. —	—	19th Jan. 1876.	681 lbs., or 1,310 lbs. per acre.	1,568 lbs., or 3,015 lbs. per acre.	Land before sowing was ploughed and levelled.
Ditto	A stiff loam, 1 acre.	8 cart-loads of yerpum and eratom plants.	—	21st Oct. 1875. —	—	13th Feb. 1876.	2,090 lbs.	2,352 lbs.	Land before sowing was ploughed and levelled, besides was hoed during growth of crop.

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Names of Crops.	Nature and Extent of Land Sown.	Manure Used.	Pounds of Seed Sown.	Dates of Sowing and Germination.	Number of Wet Days and Inches of Rainfall.	Date of Harvesting.	Weight of Produce.		Remarks.
							Of Grain when fit for Market.	Of Straw when Dried.	
			Lbs.						
Yellow cholum	Sandy loam, 2 acres.	—	60	29th Nov. 1875. 4th Dec. 1875.	7 days, 2·99 inches.	6th Mar. 1876.	1,130 lbs., or 565 lbs. per acre.	—	Land before sowing was ploughed and harrowed, and during growth of crop hoed once.
Ditto -	Sandy loam, ·62 acres.	6 cart-loads of farm-yard manure.	30	28th Mar. 1876. 31st Mar. 1876.	8 days, 3·87 inches.	10th May to 25th June.	—	Fodder 6,240 lbs., or 10,065 per acre.	Land before sowing ploughed and harrowed; during growth of crop hoed once.
Ditto -	Sandy loam, 2,697 sq. yards.	—	—	—	—	17th Sept. to 16th Nov. 1875.	—	Fodder 7,824 lbs., or 14,041 lbs. per acre.	Land before sowing ploughed and harrowed: during growth of crop hoed once.
Cumboo -	Sandy loam, 1·02 acres.	—	—	—	—	17th Sept. to 16th Nov. 1875.	—	6,972 lbs., or 6,835 lbs. per acre.	Land before sowing ploughed and harrowed; during growth of crop hoed once.
Horse-gram -	Sandy loam, 5·02 acres.	—	136	24th Dec. 1875. 31st Dec. 1875.	1 day, ·81 inches.	1st April to 1st May 1876.	—	13,848 lbs., or 2,759 lbs. per acre.	Land before sowing ploughed and harrowed; during growth of crop hoed once and dug.
Ditto -	Sandy loam, 1·09 acres.	—	15	6th Aug. 1875. 10th Aug. 1875.	15 days, 11·14 inches.	22nd Sept. to 7th Oct. 1875.	—	3,458 lbs., or 3,172 lbs. per acre.	Land before sowing ploughed and harrowed; during growth of crop hoed once and dug.

This analysis of the experiments conducted in 1875–76 may be closed with an extract regarding the working of the "Double Mhote," of which a detailed account has already been given. Mr. Robertson wrote as follows:—

"This water lift continues to give good results. Several models of it have been sent to different parts of the Presidency. In Coimbatore Municipality, to which a model was sent, I recently saw eight of these water lifts working. Regarding the introduction of these water lifts into the Coimbatore District, the Collector, in a letter to the Secretary to the Board of Revenue, No. 18, of the 10th January 1876, paragraph 6, wrote:—

"'That interest has been awakened has been proved to me by numerous ryots having come to Coimbatore to inspect the improved water lift which I had constructed from a model furnished to me by Mr. Robertson, and, by their having evinced the most practical proof of its advantage, by adopting it.'

"Other accounts are equally as satisfactory, thus—the Nawab of Muslipatam, in a letter of the 13th of June last, wrote:—

"'The model of a double mhote which you kindly gave me is found very useful here. I have constructed the mhote in my lands here, and its work is going on now. Many of the zemindars of the district are also desirous of introducing the practice of the double mhote, and I hope to see soon its usefulness throughout the district.'

The year 1876–77 proved very detrimental to the cultivation of the experimental farm, owing to the drought which prevailed. The necessity of providing food for the large number of cattle and sheep on the farm prevented the carrying out of any extensive experiments on the land where irrigation water was available. However, the crops produced without irrigation water were, in several instances, very satisfactory, especially those sown early.

"The advantages that result from deep culture were very clearly shown in the past year. The most casual observer, in looking over the crops during the drought, could not have failed in noting the remarkable superiority of the plants growing on the deeply tilled soil, compared with these growing on the head-lands of the fields and other shallow cultivated land."

The following table contrasts the results of both systems:—

Rainfall during Growth.	Duration of Growth.	Nature of Cultivation.	Area of Plot.	Yield of Straw.	Yield of Straw per Acre.	Yield of Grain.	Yield of Grain per Acre.
Inch.			Square Yards.	Lbs.	Lbs.	Lbs.	Lbs.
·16	87 days	Deep	16,027	11,456	3,459·6	221	66·7
		Shallow	2,180	216	479·5	4·5	9·99

"The whole field had been heavily manured throughout, and, if anything, the head-lands (shallow cultivation) received more than their share of the manure."

It is, however, not said what grain is alluded to.

The following table gives the out-turn of four of the several crops grown during season 1876–77, and seems worthy of notice:—

Description of Crop.	Sorghum.	Planters' Friend.	Yellow Cholum.	White Cholum.
Area of plot - -	8,470 square yards	6,930 square yards	17,632 square yards	18,207 square yards
Date of sowing - - -	17th October 1876	18th October 1876	10th October 1876	8th December 1876
Amount of seed sown - -	14 lbs.	40 lbs.	75 lbs.	73 lbs.
Seed sown per acre - -	8·00 „	27·93 „	20·58 „	19·40 „
Date of reaping - - -	24th January 1877	31st January 1877	15th January 1877	3rd March 1877
Duration of growth - -	100 days	106 days	98 days	87 days

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Description of Crop.	Sorghum.	Planters' Friend.	Yellow Cholum.	White Cholum.
During growth—				
Rainfall - - -	4·75 inches	4·35 inches	4·75 inches	·16 inch
Wet days - - -	13	12	13	3
Yield of—				
Straw - - -	8,948 lbs.	5,600 lbs.	10,096 lbs.	11,672 lbs.
Grain - - - -	1,615 „	650 „	1,640 „	225½ „
Yield per acre of—				
Straw - - -	5,103 „	3,911 „	2,771 „	3,103 „
Grain - - -	924 „	454 „	450 „	560 „

These results are attributed to the depth of cultivation, the value of which in a droughty season is so appreciable, and also to the manuring which all the fields received. The sorghum was grown on a light sandy loam, which had lain fallow during the previous year and was heavily manured with box manure; the crop was also top dressed with saltpetre; the seed was sown as little as could possibly be used with any good results. The crop of planters' friend was grown on a light soil of average quality, which had been extremely well cultivated; it only received as manure a top dressing of saltpetre. The yellow cholum was grown on a thoroughly cultivated soil, and followed a crop of indigo. The white cholum received only ·16 inch of rain; the land was in good condition from deep cultivation and a heavy manuring of horse manure.

Maize.—"A plot measuring 2,418 square yards was sown with this crop, and, under occasional irrigation, it produced, between November 8th and February 6th, 6,108 lbs. of fodder, which is at the rate of 12,226 lbs. per acre. The rainfall during the period of the growth of this crop was 3·90 inches, and it received eight waterings; it was manured with about 12 loads of stable manure, and received a top dressing of 50 lbs. of saltpetre."

Buck Wheat.—"A plot of 1,300 square yards was sown with this crop, the seed having been obtained from Australia. It grew well, and would, in an ordinary season, doubtless attain maturity without being watered; but in the present case it was necessary to do so. The seed was sown on November 9th, and within 10 weeks the crop was off the ground, leaving it ready for another. The yield was at the rate of—grain 167 lbs. and straw 1,136 lbs. per acre; but under more favourable circumstances, it would, there is every reason to believe, yield better results."

I have not noticed the experiments conducted by the Model Farm, because the farm did not quite answer the object for which it was opened; and after a trial of three years it was found advisable to close it and to transfer the land to the experimental farm for stock breeding experiments.

MANURE.

In the foregoing summary I have mentioned in each case the manures which were used in the experiments conducted on the Sydapet Farm. I may now give an account of the manural substances most used on the farm, and the means by which, and cost at which, the substances can be procured.

It has already been seen that *saltpetre*, an indigenous product, gave some good results. The place at which it was purchased was Madras, and the cost was 10 lbs. per rupee; but suitable samples for top dressing can, Mr. Robertson said, be purchased at a much lower price. The Collector of Salem sent him a sample of crude saltpetre from his district which could be procured there at 60 rupees per ton. The following is the analysis of this sample:—

	Per cent.
Moisture - - - - - -	7·90
Sand - - - - -	4·30
Chlorides - - - - -	5·40
Pure nitre (nitrate of potash) -	82·40
	100·00

I also noticed briefly *the farm-yard manure.* A more detailed account may be given by quoting from one of Mr. Robertson's reports:

"This was made in our cattle-boxes under cover, protected alike from sun and rain. It consists of straw used in bedding, and the excrementitious matters of the cattle, which being allowed to accumulate in the boxes during two or three months, layer by layer, and being constantly subjected to the pressure of the animals' feet, becomes a rich homogeneous mass of a dark brown colour, fitted at once for use, without undergoing any preparatory process. * * * We find that in an average year we obtain 20 cart-loads of this manure for *each* working bullock housed in these boxes; and this is only the manure made at night and during the day when the cattle are not engaged in field labour; thus, *for every pair of working cattle we employ we can calculate on obtaining* 40 *cart-loads per annum* of farm-yard manure, or, as it should more strictly be called, box manure. * * * We now use this manure *direct* from the cattle-boxes; formerly I had it carefully stacked in pits in the different fields in which it would be needed, but I was obliged to give this up, as the manure, in a dry season suffered so much, not perhaps by any diminution in its fertilizing ingredients but in its physical properties, for it must be remembered that the beneficial results attending the use of farm-yard manure are due to no inconsiderable extent to its physical action on the soil, as well as to its power of yielding to the soil the exact chemical food needed for the production of crops. * * * ."

Cotton Seed Manure.—"This was simply cotton seed which had been steeped in urine or water to destroy its vitality. It is undoubtedly one of the best manures we possess, and is suited for any crop that will grow, more especially the cotton crop. In cotton seed we have a large quantity of fertilizing matter concentrated in a very little bulk. It is thus well suited for coffee or tea planters, and where in order to reduce the cost of transit, it is necessary to get a *portable concentrated manure.*"

Carbonate of Lime.—"We obtain this in the form of burnt shells (marine and fresh water) such as are used for preparing shell chunam in the Madras District. They yield an almost pure carbonate of lime, containing an exceedingly small quantity of impurities. After being slacked it forms a light powder, which can, with great facility be spread over the land."

But the difficulty seemed to lie in the cost of fuel for burning the shells. This difficulty, Mr. Robertson said* would be overcome "in those fortunate "districts in which lime abounds, if the present "rumour of the discovery of the local formations in "one or two districts of this presidency turns out to "be correct, as coal can be conveyed long distances "by rail at a very low rate."

Bone Dust.—This is minutely pulverised bones; so prepared in order to facilitate distribution over the surface of the ground. But in order to avoid any adulteration of bone-dust by the dishonest dealer, bones broken to a quarter or half inch size can be procured and used quite as effectively, not perhaps in the immediate result but in the general effect.

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"All the different preparations of bones are valuable to the farmer, whether as boiled bones, crushed bones, bone dust, bone black, or in the form of superphosphate chiefly in yielding phosphate of lime; though in the *raw state* bones yield a large per-centage of ammonia, still it is as a means of adding phosphate of lime to the soil that they are chiefly employed by the farmer, as it is phosphoric acid and phosphate of lime that all cultivated crops appropriate so largely. * * * Bones are costly in this part of India, but there seems little probability of their becoming cheaper, as their use is becoming much more general, especially amongst the tea and coffee planters on the hills. Our only hope of obtaining phosphatic materials at a fair price * * is in the discovery of phosphatic rocks, or coprolites, in accessible parts of our own Presidency."

Mr. Robertson has some hope of such rocks being found in the Presidency, and he mentions the fact that small quantities have been discovered in the Trichinopoly Collectorate.

Oil-cake.—"The variety of cake used is known in Mysore (where it is chiefly produced) as 'Ippa' cake, in Madras it is called 'Ilpa' cake. The seed from which it is manufactured grows on a small tree, the botanical name of which is *Bassia Longifolia.*"

It can be obtained in sufficient quantity in Bangalore, and a small lot of this cake, weighing 3,002 pounds was purchased there for 8 rupees, or at the rate of about 15 maunds for the rupee. Mr. Robertson said that of all the manures he used in 1871–72, the Bassia nut cake produced the most satisfactory results. No analysis of this cake had been made, but one made of the cake of the nut of the *Bassa latifolia* by Dr. Voelcker may, it is said, be accepted as indicating pretty closely the general character of the Bassia nut cake. The analysis is as follows:—

	Per cent.
Moisture - - - - -	13·54
(*a*) Organic matter - - -	80·79
Phosphate - - - - -	1·43
Magnesia, &c. - - - -	3·63
Sand - - - - - -	·61
	100·00
(*a*) Containing nitrogen - - -	2·73
Equal to ammonia - - -	3·31

Castor-oil Cake.—(50,000 lbs.) was used on the Sydapet Farm. It was bought at the moderate price of about 15½ rupees per ton delivered in Madras. The cake was generally used as a top dressing after being first pulverized, and was applied at the rate of 200 pounds per acre. The result was in most instances very satisfactory, and the cake proved much superior as a manure to most of the ordinary manurial oil-cakes. The following is an analysis of castor-oil cake by Dr. Voelcker, and published in one of the journals of the Royal Agricultural Society of England.

	Per cent.
Moisture - - - - -	9·95
(*a*) Organic matter - - - -	81·07
Phosphate of lime and magnesia -	4·49
(*b*) Alkaline salts - - - -	1·80
Sand - - - - -	2·69
	100·00
(*a*) Containing nitrogen - - -	8·69
Equal to ammonia - - -	10·55
(*b*) Containing phosphoric acid - -	·06
Equal to tribasic phosphate of lime -	·13

"It will be noticed that the cake is especially rich in nitrogen; it is, therefore, a powerful fertilizer. Its action is slow; but when mixed with cattle manure it becomes a great deal more active and more fitted to meet the wants of quick growing crops. For coffee and tea plantations a more useful auxiliary manure can scarcely be obtained, and it can, in most parts of the Presidency, be bought at a very moderate price."

Poudrette.—"A large quantity of poudrette was made; it consisted of village ashes and the excrementitious matters collected daily from the village latrines."

Care was taken to have the ashes thrown over the matters.

"After remaining in heaps thus formed, for six or eight months, the manure became thoroughly deodorized and fit for use. In this state the coolies made no objection whatever to work with it;" and the character of the manure was so thoroughly changed, that few persons could, from its appearance, determine the nature of its original ingredient.

This poudrette was used with great success on maize, cotton, cholum, &c.; indeed it is fitted for the wants of any of our cultivated crops."

The Fern.—(Pteris Aguilina) generally known as the bracken. This is found abundantly in many parts of the higher hill ranges, of the Madras Presidency. It is "used as a litter for cattle stalls, &c., very "largely by coffee planters resident on the Neilgherries, "in Wynaad and in Coorg. For this purpose it is "well suited where the straw of cereals is costly and "difficult to obtain. * * * When used in "cattle-boxes, the fern rots more readily than ordinary "byres; it is used chiefly in the large open 'crawls' "in which buffaloes and hill cattle are confined at "night. * * * These 'crawls' are kept "liberally bedded with ferns, grass, &c., which, under "the treading of the cattle at night, aided by rain, "become broken up and worked into a black-coloured "mass. This is a convenient and expeditious way of "working up ferns, &c. into a form convenient for "manure." * * *

The following is an analysis* of the composition of the ash of the bracken, compared with an average analysis* of wheat straw:—

	Bracken	Wheat Straw.
Per cent. of ash - -	7·01	4·95
Composition of the Ash.		
Potash - - -	42·8	11·5
Soda - - - -	4·5	2·9
Magnesia - - -	7·7	2·6
Lime - - - -	14·0	6·2
Phosphoric acid - -	9·7	5·4
Sulphuric acid - -	5·1	2·9
Silica - - -	6·0	68·3
Chlorine - - -	10·2	—
Total - -	100·	99·8

"It will be observed, in comparing these analyses, that not only does the fern yield a much larger quantity of ash than wheat straw, but that more than one half of this ash consists of the highly valuable fertilizing minerals, phosphoric acid and potash, both so essential in a soil on which coffee trees are growing."

Cattle Dung Fuel.—Mr. Robertson points out the loss which agriculture suffers from the practice the cultivators have of using cattle dung as fuel. The approximate composition of the urine and of the dung are said to be as follows:—

—	Urine.	Dung.
Water - - - - - -	920	840
(*a*) Organic matter, urea, uric acid, &c.	60	135
(*b*) Inorganic matter, salts of potash, soda, &c.	20	25
Total - -	1,000	1,000
(*a*) Containing nitrogen capable of yielding ammonia.	9·00	3·60
(*b*) Containing phosphoric acid - -	·70	2·25

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* By Professor Emil Wolff, of the Royal Academy of Agriculture at Hohenheim, Wirtemberg.

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Mr. Robertson says that it will be seen from this that the urine is a very valuable fertilizing agent, and that the country suffers a serious loss from the urine being allowed to run to waste. Much loss, he says, is also caused by the solid excrements being used as a fuel, for the whole of the organic matter, which constitutes at least 85 per cent. of dry dung, and which contains, amongst other valuable plant food, a large percentage of nitrogen, the most costly and most difficult to replace of all these foods, is dissipated into the air and lost. Nor is any economy secured by using cow-dung for fuel, since the selling price* of a ton of dry dung is, in most instances, in excess of the selling price of firewood, and, at the least, double the price at which firewood could be produced in the neighbourhood of towns, and on the holdings of ryots for their household use.

Mysore.—It has already been said that in the Mysore Province a farm was started at Bangalore, and that Mr. Harman was appointed in charge of it.

The plot selected was of 142 acres and 17 guntas in extent, and contained excellent soil both for wet and dry cultivation, and its proximity to the centre of population made it especially adapted for the objects in view. These objects were (1), the preparation of well trained and instructed young men for the charge of district farms hereafter, and (2) the production of the best grain crops, indigenous and imported, on high farming principles, and the rearing of a few cattle, sheep, and poultry of the best description.

Mr. Harman arrived in March 1875, and before being put in charge of the farm, was placed at the Sydapet Farm at Madras under Mr. Robertson, in order that he might familiarize himself with the system of agriculture followed there. After a training of five months at Sydapet, he took charge of the farm in August 1875.

The only report of his which I have been able to procure is the one for the year 1876-77. There is one other, but as that was the first one, no result of any agricultural experiments is perhaps recorded in it, and it cannot therefore be of much use for our purpose.

The report for the year 1876-77 tells us of the many works of building, implement making, land improvement, and agricultural experiments which were carried out. Omitting the first two, I shall notice only such of the proceedings as will serve our purpose.

Ever since the farm was started (August 1875), seasons of unusual drought had been experienced, but during that time various improvements were effected ; roads were made, weeds, which were numerous, were destroyed, and land was levelled and equalized. Besides this, surface drains to a length of 3,000 feet were cut. A large portion of land being low, numerous channels and outlets for water were required, and by their help several acres of fine soil, up to then a useless swamp, were brought under cultivation. Across the main drain a substantial dam was constructed, and sluice gates were provided.

Every well on the farm was cleaned and repaired, and a number of earthen channels were constructed to lead the water over larger areas than were formerly irrigated. The raising of water from wells by the ordinary "yatam" of the country being an expensive operation, steps were taken " to introduce a modification of the double wheel so successful in the Madras Farm."

Topes of mango trees were planted out and cocoanuts were put along the banks of the main drain ; besides a nursery, containing seeds of various useful trees, being laid out.

Mr. Harman confessed his ignorance of the system of agriculture followed by the ryots of the Mysore Province, and strongly urged the advisability of being allowed to make short tours through the principal agricultural districts, at varying times of the year, so as to enable him to acquire the practical local experience which he was in need of.

An experiment was made to test the capabilities of the native against the English plough. The ploughing was started and stopped at the same time, and while a native plough went over 749 square yards in 7 hours, an English plough worked up 3,031 square yards ; the former attaining a medium depth of three inches, and the latter of four inches.

The following are the results produced by each of the ploughs :—

Kind of Crop.	Area in Decimal of an Acre.	Details of Cultivation.	Produce in Lbs.		Produce per Acre in Lbs.	
			Grain.	Husk.	Grain.	Husk.
Horse gram - -	·154	Native plough ; no previous crop ; no manure used ; soil light sand ; broken up and sown by three turns of the plough.	30	70	194·8	474
Ditto - -	·220	English plough ; no previous crop ; no manure used ; soil light sand ; broken up by a single ploughing, and seed covered by a brush harrow made of bamboo twigs tied together.	49	154	222·7	700

Another experiment was made with both sorts of ploughs for testing the implements as crop producers. The experiment gave miserable returns in both cases, owing to the drought, yet it is sufficient to indicate the superiority of the English implement.

Kind of Crop.	Area of Plots in Decimal of an Acre.	Seed sown in Measures.	Produce in Measures.	Produce per Acre.	Remarks.
Black gram - - - -	·197	6	·25	12·19	Native plough ; no manure used ; soil broken up as thoroughly as possible by several ploughings.
Karamani - - - -	·27	4	5·00	18·40	
Green gram - - - -	·27	4	6·00	21·70	
Black gram - - -	·4	11	9·25	23·12	English plough ; no manure used ; soil broken by three ploughings.
Karamani - - -	·5004	8	50·50	22·98	
Green gram - - -	·4	5	36·00	90·00	

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* The price, however, is not quoted.

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Various attempts were also made to raise crops of different sorts, but the unfavourable season caused most of the experiments to fail.

Queensland maize was, however, grown with some success, from seed which had been raised on the Sydapet Farm.

The area sown was ·415 acres; the land was first rate garden loam; ten waterings were given from a well, chiefly while the plants were young; town manure was used at the rate of 12 loads per acre. In a month the plants were 10 inches high, when a slight top dressing of village manure, about five loads per acre, was given, and the land was thoroughly hoed. The cobs were ready in three months, and were sold by public auction for Rs. 26 at the rate of Rs. 62-10 per acre. The yield was at the rates per acre of, green cobs, 6,291 lbs., and fodder 14,894 lbs. The cobs averaged 261 to the hundred-weight.

Another plot of ·52 acres was sown without irrigation. The soil was good garden soil, and the cultivation was the same as that of the above-mentioned plot. Green cobs were sold for Rs. 64-8, or at Rs. 124 per acre. The cobs averaged 125 to the hundred-weight, and the crop gave a total yield at the rate of, green cobs 14,277 lbs., and fodder 10,680 lbs., cut and weighed one week after removal of the crop.

Sorghum Saccharatum, apparently introduced into Mysore in 1870, was largely grown under a variety of conditions during the year:—

"The great weight of green fodder it gives per acre, even during this dry season, has been well brought forward, and the slight trouble incident on its cultivation is a point much in its favour."

"As a catch crop, sown early in the season so as to be removed in time to get in horse gram, it was thoroughly successful. On June 16th, a field of poor land was thrice roughly scratched with the native plough, the seed sown broad-cast, and again ploughed to cover it in. On August 25th it was harvested, and yielded 18,460 lbs. of green fodder per acre. The land was at once ploughed, and sown the next day with horse gram, which gave, on harvesting, 220 lbs. of grain per acre. Nothing was here attempted but what the poorest native might do; no manure was applied, and no irrigation; while only the country implements were employed."

"A second crop sown broad-cast on July 1st, and harvested 8th September, when weighed, gave the following results:—

"Plot (*a*).—Following an unmanured crop of gram on tolerably good land—24,240 lbs. per acre.

"Plot (*b*).—Following a crop of maize which had been manured at the rate of 15 loads per acre with town refuse—25,600 lbs. per acre."

Another crop, grown in rows two feet apart, on good garden land and irrigated twice, was left for seed. The soil had been deeply cultivated by hand, and during growth of the plants was three times hoed. On the 31st October the crop was harvested and yielded at the rate of 1,480 lbs. of seed, and 19,120 lbs. of partially dry straw. The stumps left in the ground were watered, and gave, in six weeks, a second cutting of 3,800 lbs. fodder."

Sugar-cane.—"Two plots of sugar-cane measuring one acre and half an acre were planted in March 1876.

"Plot No. 1.—A portion of this plot, which was planted entirely with the white variety, was devoted to experiments with manures, such quantities being applied as were equivalent to an expenditure of Rs. 40. The following are the weights of the canes of duplicate plots of $\frac{1}{40}$ an acre:—

Manures.	No. 2 plot.	No. 7 plot.	Mean Result in Lbs. per Acre.
	Lbs.	Lbs.	
Unmanured - - -	2,064	2,046	82,200
Village refuse, 1 load, honge cakes, 4 maunds.	1,813	2,079	77,840
Village refuse, 1 load, castor-oil cake, 4 maunds.	1,893	1,917	76,200
*Village manure, 2 loads - -	—	1,680	67,200
*Lime - - - -	1,155	—	46,200
*Honge cake, 8 maunds - -	1,924	—	76,960
*Castor-oil cake, 8 maunds -	—	2,074	82,960

* The second plots of these were unreliable, as they were exposed to wind, and were in proximity to a clump of bamboos which absorbed a portion of the manure and water.

"These results, which are excessively high (55,000 lbs. being an average crop) are due in a great measure to the deep cultivation and thorough aëration the land experienced by being broken up deeply, early in the year, and then lying in a rough state exposed to the atmosphere for some months. Previous to the opening of the farms, the ground suffered severely from supersaturation and an occasional overflow of weak sewage water. The canes on the unmanured plots found, in the deep aërated soil, ample nourishment, as, under the native system of cultivation it had only been dug to about eight inches in depth, and had never been allowed to thoroughly dry. In consequence, an enormous amount of plant food was stored up, and being unaërated, was, to a great extent, unavailable; and, thus year after year, while the fertility as garden land was kept up by constant supplies of manure applied to the few inches of surface soil worked, a store gradually accumulated at a deeper level which was untouched. The canes on the other plots, under the same conditions, did not avail themselves of the extra manure, and it probably lies in a great measure undecayed, and will only yield up its constituents to subsequent crops when they begin to find the more easily assimilable sewage salts fail."

Guinea-grass was planted as an experiment to test the relative value of manures, on irrigated and unirrigated plots during dry weather. Plot No. 1 was watered eight times. The manures in both plots were dug in between the rows of grass, and the land left as rough as possible. No rain fell during the experiment, nor had any fallen for some time previous. The lime was applied unslaked. The results are given in lbs. of green grass per acre:—

Manures.	Plot No. 1 Irrigated.	Plot No. 2 not Irrigated.
No manure - - -	2,520	1,200
Ippe cake - - -	4,160	1,160
Village refuse - -	4,480	1,360
Lime - - -	4,880	3,920

Kusumba.—"This plant, useful both for grain and dye, has withstood the dry weather better than any other crop, indigenous or imported. A plot of ground measuring 4,193 square yards, which had been prepared by a thorough cultivation with English implements, was sown on August 22nd. The land having had no crop for some years, and it being desireable to offer every facility for cleaning, the seeds were sown by hand

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in rows two feet apart. When a few inches high, the hoes were set to work and the land kept stirred and free from weeds.

"The crop was harvested on December 23rd, and yielded 265 lbs. of seed, or at the rate of 282·2 lbs. per acre.

"A second plot, sown broad-cast September 15th and harvested February 5th, yielded at the rate of 220 lbs. per acre. During the time the crop was in flower, the petals were sold to a contractor who picked them for the preparation of dye. Considering the season and the late sowing time, the return shows that it is useful to grow on dry land with a rainfall insufficient to bring to maturity gram, wheat, and other late sown crops."

This is all the information we have regarding the operations conducted on the Bangalore Farm. But from an article in the *Madras Times* newspaper, it appears that Mr. Harman proceeded on a tour in the districts of the province, and in August last he was in the Hassan District, showing the ryots the advantages that may be gained by the English plough, and teaching them the use of it by practical demonstration. Tours like this, the Chief Commissioner said in a letter to the Government of India dated 11th April 1878, were to be made in various parts of the province, and they would comprise two periods, one from June to August, during the cultivating season for the dry (ragi) crops, and the other during the cold weather months when the crops are harvested.

Berar.—In Berar the cotton farm at Akola which was started as an agricultural experimental farm, as a tentative measure for five years, did not prove a success, and after a short trial it was closed. I have, however, not been able to get the necessary papers to ascertain under what circumstances the experiment failed.

Central Provinces.—In the Central Provinces, the Nagpore Farm, which had been under the Cotton Department, was placed under the Local Administration, and Captain Macdougal, who had studied the English system of farming while at home, was appointed superintendent.

The farm contained in all 461 acres, and was situated on the south bank of the Nag Nadi, the Southern Road bounding it on the east, and the Ambajhari Reservoir on the west. The soil was generally poor, and where the good was to be found, the depth was very insufficient for the growth of good crops. The sub-stratum was muram or decaying trap, and this grit was constantly cropping up all over the farm. It was not found advisable to plough too deep for fear of raising the poor weak sub-soil, and it was therefore found necessary to improve the surface soil. Work began regularly in 1873, and drainage work was especially attended to; roads were made and fields were divided into blocks.

The agricultural experiments in this, the first year, did not prove at all successful, and the Chief Commissioner, in reviewing the farm report, said that the results were very discouraging. The following year, 1874–75, the operations again gave little encouragement, and Captain Macdougal attributed the want of success to the nature of the soil. He said that he could not report very favourably of the soil during this second year, but he thought that each year's operations, leaving behind a certain amount of vegetable matter, must enrich the land in the end; and this end, he said, would be more rapidly obtained if he could procure a good supply of manure.

The year after, 1875–76, the results proved much more favourable; the soil had much improved; and it was settled that the farm should be worked in three divisions, thus:—

I.—A small part, as an experimental farm, for trying new crops and modes of culture.

II.—A large part as a farm for green fodder crops.

III.—The remainder, as a model farm proper, whereon ordinary staple crops should be grown to the best advantage on commercial principles.

An irrigation channel from the Ambajhari tank had been completed, and the area brought under irrigation was 166 acres. A difficulty, which had been experienced in procuring manure, was being got over by an arrangement which was being made with the municipality for taking over all the night soil and sweepings of the town.

Although, after a most propitious first burst of the monsoon, the rainfall had been too continuous, still, on the whole, the season was not altogether unfavourable. A total area of 292 acres was under cultivation.

"The natives," Captain Macdougal said, "acknowledged the superiority of some of our implements, and it only wants persistent working of others to show how much labour is saved, and harvesting rendered easy. One improved native plough with English mould-board attached was during the year sold to * * *, the proprietor, in fee simple, of the village of Mohogaon. He has reported in high terms of praise of the work performed by the implement, and has been asked by various neighbours to let them have it on loan."

The most noticeable results of the crop experiments were the following:—

Cotton.—Six acres were sown with cotton, the land being manured with the previous years' cotton seed. Several pickings were obtained, and these yielded a weight of 304 lbs. of clean cotton per acre; the yield during the previous year had been 84 lbs. per acre, and average yield of the ryots' crops was understood to be less than 28 lbs. per acre. A very careful selection of the seeds from the crop which produced 304 lbs. per acre was made. "It may be here noticed "that this 6-acre plot attracted much attention from "ryots, who, in ascribing various causes for the lasting "properties of the plants, admitted that deep cultiva"tion had a very leading influence."

Wheat.—Next, a wheat crop may be noticed, which was sown early in October in drills nine inches apart, on two acres of land manured with sweepings. A couple of days after the first rains, a fine braid showed itself, and the plants never ceased growing till the end of December, when the ears began to form. The yield was at the rate of 616 lbs. per acre. When the crop was in the ear, it was noticed that there were two sorts of wheat mixed up; one, a red-eared wheat with a thick, short, fore-sided, compact ear, well filled, and having the appearance of a heavy cropper; the other, a white-eared variety, more elongated in the ear, less compact, and wanting a look of strength. A good supply of the seed of each of these two varieties was secured for the following year's experiment.

Several other crops were tried, and among these we find that linseed was sown early in October, the land being manured, and produced at the rate of 486 lbs. per acre. Mote and lemon-grass are said to have succeeded, and to have furnished fodder, which was readily consumed by the cattle.

The year 1876–77 gave continued good results, and the Chief Commissioner, in reviewing Captain Macdougal's report, remarked that "the degree of success "which has now been reached affords ample encourage"ment for the future." Captain Macdougal said: "our farm lands * * * are becoming well stored "with fertilizing ingredients, and yearly a marked "change is seen in the crops." Latrine and cattle manures continued to be used, and in addition to these bones and lime formed a portion of the experiments. The irrigation channel and its supply had a full year's trial, and the supply of water did not prove so full as had been hoped, for while during the rainy and cold season the supply was abundant, during the hot season it did not suffice for more than about 16 acres out of the 166 acres irrigated at other times.

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On the *experimental portion* of the farms, the following cultivations were carried out:—

Cotton.—The cotton seed which had been selected from the previous years' produce was sown, and gave a yield of 326 lbs. of clean cotton per acre. This result was effected partly from improvement in the plant, gained by careful cultivation, and partly from irrigation. The experiment had been carefully watched by several ryots.

Lucerne grass was grown, and yielded nearly three tons of fodder per acre, "and the yield would have "been nearly doubled had not about half an acre been "reserved for seed."

But this crop, which is a perennial one in other soils and parts of India, can only be treated as an annual at Nagpore, owing to the hopelessness of carrying it through the rains.

Pissi wheat, which strongly resembles English wheats, was sown late in November, too late in fact in the season, and the seed obtained was not of good quality. Yet the crop, after having been irrigated three times, yielded 600 lbs. of wheat per acre. Some strong plump seeds from this were selected and reserved for the following years' trial.

Oats bore a fair crop, returning 1,100 lbs. to the acre; but the ryots do not appreciate the grain as food, owing to its being so glutinous to their taste.

On the fodder farm guinea-grass, lucerne, lemon-grass, sweet potatoe, and hariali all passed beyond the experimental stage, and "can be successfully cultivated on a large scale as fodder." Symphatum still required further trial. Oats and barley were more or less a failure, and they seemed unsuited to the Nagpore Farm.

The hariali gave heavy crops of fine hay during the rains and cold weather, and the produce was between 3 and 3½ tons of hay per acre. Besides this, "after the hay is removed, irrigation supplies a good "'aftermath,' which remains green and sweet, and "can be eaten down by the cattle from time to "time."

Sweet potatoes proved to be a good forage crop; the produce was about 3 tons per acre, and this could be repeated three times at least in the year, allowing the planting out to occur in October.

"The cattle have eaten it freely, the cultivation of the crop is very simple, and it is not a greedy drinker wanting much irrigation."

The commercial portion of the farm again proved a success. 307 acres were cultivated at a total cost of Rs. 1,407, or about Rs. 4½ per acre; and they yielded produce worth Rs. 3,500 or Rs. 11⅜ per acre.

The chief crops raised were the following:—

Wheat.—In the report for the previous year it was said that some farm-grown wheat had been separated into two distinct varieties, *viz.*, white and red-eared wheats. To these the Jelalia wheat of the Nerbudda Valley was added, and all three varieties were sown on a six-acre field of irrigated land that had been heavily manured in 1875–76 for cotton. The field was divided equally, each of the three varieties having 2 acres, and only one irrigation was given, the spring rains having supplied the necessary moisture for a second watering. The out-turn was:—

	Per acre.
	Lbs.
Jelalia - - - - - -	1,600
White-eared - - - -	2,200
Red " - - - - - -	920

"The yield of the first two," Captain Macdougal said, "is quite up to the average of English farming "per acre; while the comparative failure of the red-"eared stock is mainly due to the 2 acres it was "grown on, being of a sandy, gritty soil, somewhat "too light for a good crop to be expected. The "heavy yield of the Jelalia and white-eared kind "shows that high farming will pay."

The quantity of seed that was sown was 40 lbs. per acre, whereas the ordinary ryots of Nagpore sow 50 lbs., and the Nerbudda Valley ryots sow 80 lbs. per acre, and obtain a yield, respectively, of 400 and 800 lbs. per acre.

In another field which was in its fifth year of continued cropping, and had been manured in 1872, the out-turn obtained from the white-eared variety was 700 lbs. per acre.

Jowar, the staple food grain of the poorer classes in the Nagpore Division, was sown in different soils, and the out-turn varied according to the nature of the soil from 531 lbs. to 232 lbs., the yield in the preceding year having been 206 lbs. and 45 lbs. In the year under report the jowari fields yielded a second crop of grain and fodder, as the shoots sprouted under the unwonted rains of January. This extra crop gave 71 lbs. per acre.

Linseed was the last of the chief crops grown, and its yield varied from 529 lbs. per acre on a field which contained a patch of the very best soil on the farm, to 121 lbs. per acre on a field at the extreme west, then recently taken over from ryots. White or Howrah linseed, which holds a higher place as an oil producing seed than the red kind, in the local market, was tried for the first time and returned 286 lbs. per acre.

"This is, however," Captain Macdougal remarked, "susceptible of improvement." "Our red linseed," he said, "is pronounced by dealers to be of first class "quality; and having got this, the yield has to be "increased."

This ends the summary of the operations of the Nagpore Farm, and now we go on to the Bombay Presidency where the Bhadgaon Farm in Khandeish, the Nowlur Farm in Dharwar, and the Salaru Farm in Hyderabad, were in existence.

The Bhadgaon Farm consisted of 2,505 acres of land held temporarily at grazing rate, and 533 acres subject to full survey assessment rates. It had four wells for irrigation purposes, and the Jambda Canal, which flowed round a good portion of its area and let in its water by means of irrigation nallahs which intersected the fields here and there. The cost of working the farm in 1873–74 was rather heavy, the land at the commencement of the year was full of weeds, and until these were quite eradicated, full advantage could not be taken of the facilities which the canal afforded for irrigation. The annual grant for working the farm was, moreover, small, and this prevented the cultivation of a large area under irrigation, as both the irrigation rate and the extra cost for the necessary manure, under such a system had to be paid.

In 1873–74, 464 acres were under cultivation, and of this area 98 acres were under *cotton*. The weather was at first very favourable for this crop, but the prospects of what would have been an unprecedented crop were spoiled by the season having turned out unpropitious; during the break in the rains in August the crop was attacked by a species of "Aphis," and when the rains came on again in September, the heavy downpours stripped the bolls, flowers, and leaves. The details of the cultivation of the cotton are the following, these being some of the best results produced:—

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Variety of Cotton.	Area Sown.	Lbs. of Seed Sown.	Date of Sowing.	Manure Used.	Date of Picking.	Out-turn of Seed Cotton per Acre.	Out-turn of Clean Cotton per Acre.	After what Crop Sown.
	A. G.					Lbs.	Lbs.	
Model Farm, Hingunghat	6 28	80	June 10th -	None -	Oct. 6th to Dec. 14th.	613·13	176·56	Tobacco.
Ditto - -	7 10	91	„ 9th -	„ -	Sept. 27th to Feb. 10th.	556·27	160·28	Tilly.
From Dhurungam -	1 27	14	„ 18th -	Dissolved bones.	Nov. 29th to Feb. 24th.	302·08	87·16	Jowari.
Ditto - -	1 27	14	„ 18th -	Superphosphate.	Nov. 29th to Feb. 24th.	358·21	103·28	Do.

Ambari, a fibre superior in appearance as well as in strength and durability to the purchased article and also to sunn, was every season cultivated to a small extent to supply the requirements for ropes for agricultural purposes on the farm. The seed was always sown with the seed of the jowari and tilly crops. That raised amongst the jowari was allowed to ripen its seed (which are useful both as oil seed and as cattle food) and was as a rule cut after the jowari was harvested. That sown amongst the tilly was cut whilst in flower, in order that it may not impoverish the soil for the following rabi crop. The latter generally produced the whitest and most glossy fibre, the former the longest and strongest. The quantity cultivated in 1873–74 produced 1,076 lbs. of fibre. The extent sown, or the proportion of produce per acre of land sown. is, however, not given; but it is stated that the cost of cultivation, &c., was Rs. 54–15–6, while the value of the fibre produced was Rs. 53–12–9, and that of the seed obtained was Rs. 36. This, therefore, gave a profit of Rs. 33–13–3, after deducting the cost of cultivation, &c.

Sugar-cane was also grown. The best result was that which gave a net profit of Rs. 73–3–4 per acre. The total expenditure had been at Rs. 174–0–6 per acre, and the value of the out-turn was Rs. 247–3–10 per acre; ·32 tons per acre of purchased farm-yard manure was used, and irrigation water was supplied from the Jambda Canal. No details of cultivation and weight of produce are, however, given.

Several other crops were tried, but neither the details of cultivation nor the weight of produce are given; only the financial aspect of the experiments are reported on, and these do not show that any marked success was achieved; in some cases, on the contrary, a loss was sustained on the cost of cultivation. The Bombay Government, in reviewing the report, noticed that no less than 40 different products were grown, for many of which there was no local demand.

"This seems," they observed, "to show that sufficient attention has not been given to the main object of the farm, which is to improve the native method of agriculture."

In 1875–76 there was an increase of 21 acres in the area under cultivation. The season had not been a good agricultural one; the rainfall had been somewhat scanty, and particularly irregular and unseasonable.

139 acres were under *cotton*, divided into 17 plots. The land was in good order and cultivated on the ridge principle, bnt the crops proved variable in the extreme. The greatest yields were the following:—

Variety of Cotton.	Area Sown.	Lbs. of Seed Sown.	Date of Sowing.	Manure Used.	Date of Picking.	Out-turn of Seed Cotton per Acre.	Out-turn of Clean Cotton per Acre.	After what Crop Sown.
	A. G.					Lbs.	Lbs.	
Hingunghat -	12 15	160	June 21st -	None -	Oct. 26th to Jan. 12th.	258·34	75·55	Last year's sugar-cane crop, which was but sparingly manured.
Ditto -	10 0	94	„ 21st -	„ -	Nov. 8th to Jan. 6th.	338·4	98·98	Field gravelly in parts, but beautifully workable.
Ditto - -	7 0	85	„ 25th -	„ -	Nov. 3rd to Jan. 27th.	443·14	129·73	Fine land. Liberally manured for sugar-cane year before last.

Sugar-cane was grown in 15 acres of land. The cost of the cultivation was Rs. 61–10–9 per acre, and the value of the out-turn was Rs. 73–11–4 per acre, giving a profit of Rs. 11–15–7 per acre. But neither the details of cultivation nor the weight of the produce are stated.

The Bombay Government having made a special grant of money for sericultural operations, a mulberry plantation which had been reared previously was extended and skilled labourers were sent for from Bengal.

"A good deal of attention was devoted to the extraction of fibres and to the collection and propagation of fibre producing plants." But besides this general statement of the fact, no detailed account of the operations is reported, neither is the weight of any produce given. A ton of hemp was prepared and sent to the Flax Supply Association of Belfast; samples of flax and tow were sent to several farms in Bombay, Dundee, and Ireland, and working samples of various fibres to the Dundee Chamber of Commerce; but the results are not stated.

The cultivation of tilli resulted in a loss of Rs. 130–7. Bajri failed, as also indigo, gram, wheat, maize, earth-nut, &c., while jowari, aal, tobacco, linseed, capsicum, hay, &c., yielded small profits.

In 1876–77 the area under cultivation was the same as that in the previous year. The rainfall was very scanty and irregular, and quite unequal to the production of a full crop. Still the results of the experiments were considered very encouraging by the Revenue Commissioner.

138 acres were under cotton, and some of the best results of the plots into which the area was divided were as follows:—

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Description of Cotton.	Area Sown.		Lbs. of Seed Sown.	Date of Sowing.	How Manured.	Date of Picking.	Out-turn of Seed Cotton per Acre.	Out-turn of Clean Cotton per Acre.	Remarks.
	A.	G.					Lbs.	Lbs.	
Hinganghat -	13	22	145	June 16th -	None -	Nov. 11th to Jan. 11th.	178·22	53·40	
Ditto -	9	39	132	„ 17th -	„ -	Nov. 22nd to Jan. 18th.	182·65	54·60	
Ditto -	11	9	128	„ 16th -	„ -	Oct. 28th to Jan. 9th.	342·9	102·60	
Dharwari -	8	29	109	„ 17th -	„ -	Oct. 30th to Dec. 28th.	157·59	47·10	
Ditto -	4	33	60	„ 19th -	Night soil and earth.	Oct. 23rd to Nov. 30th.	195·85	58·50	Three waterings from the canal.

Bajri was grown on 73 acres divided into nine plots, and the crop on the whole proved to be a good one, considering the unfavourable season. The total profit from the whole area was Rs. 205–10; but as usual the details of cultivation and the weight of the produce are not given.

Wheat was sown to the extent of 47 acres, and notwithstanding the bad season and the pilfering that took place from a neighbouring village, the produce was reckoned at 15 to 16 bushels per acre. Some seed was distributed through a merchant to the village cultivators under the usual condition of payment, and a quantity was left on the farm.

Tilli proved much more paying than in ordinary years; the seed was all clean and of good quality, and gave a profit of Rs. 211–13–6 over the cost of cultivation.

Sugar-cane was grown to a much smaller axtent, because almost every village had become well stocked with the Mauritius cane that had been imported and distributed through the farm, and did not therefore require much seed.

The seeds of various trees were planted out.

The *Carob tree* had just sprouted. The Arnatto, which had been the subject of experiment in the early days of the farm, was represented by only one fine large bush which "yields annually two or three crops of seed," and experiments showed "that colouring pulp " is readily precipitated by the same process observed " here in the case of indigo."

The *Sweet Inga* was thoroughly established all over the farm, and it yielded a timber well suited to the requirements of an agricultural district. The pods, " which have been exceedingly abundant this year, " afford a sweet and nourishing food in the pulp they " contain," and "the weight of pulp contained in " each pod is about ¼ oz., so that a full grown tree " yielding, say 1,000 pods, would produce 250 lbs. of " food."

The *Divi-Divi* tree was also very fruitful, and produced in the year under report 5 cwts. of pods. The seeds were made into packets of 2 dozen seeds each, and distributed to each village patel in the collectorate.

The *Nowlur Model Farm* is situated about 3 miles south-east of Dharwar on the main line road. It was started in June 1873; the soil was of great variety; water could be had close to the surface, and altogether " a better spot could not have been selected for model farm purposes." The area of land taken up was about 230 acres of arable land and about 175 acres of grazing land; but owing to the lateness of the season at which the operations were commenced, and to the smallness of the grant of money made, only 74 acres 22 guntas of land were cultivated. Immediately after the first fall of rain in July, sowing was commenced with jowari, and was followed by cotton, wheat, and gram. The following is an abstract of the results of the operations field by field:—

Field No. I.—Rainfall pretty fair; soil partly good, black, partly a mixture of black and red, and red and stony; previous working had to all appearance been much neglected. Therefore it was deeply ploughed up with English ploughs, and well stirred. The inferior portion of the field was sown with jowari, tur, and mung, and the good black with indigenous cotton.

The yield of jowari "and other grains" was at the rate of 403 lbs. per acre, and the yield of cotton was at the rate of about 154 lbs. of clean cotton per acre.

Field No. II.—Much like the 1st field, but situated under a large tank and a well; it was sown with jowari and other grains, and also with cotton. The produce of grain was about 655 lbs. per acre, and the produce of cotton (hybridized and selected seeds and acclimatized New Orleans) was only 75 lbs. per acre, owing partly to blight, and principally to decay of the seed from long keeping.

Field No. III.—Ordinary black soil, was well ploughed and carefully manured, and was sown partly with wheat and partly with cotton; but the want of rain after the sowing caused a failure, giving only 16 lbs. of clean cotton per acre, and 178 lbs. of wheat per acre, including kusumba.

Field No. IV.—Soil a loamy red, under a large village tank, and used for growing rice, sugar-cane, and market vegetables. After being prepared, the land was sown with acclimatized New Orleans cotton seed purchased in the market, and containing an admixture of indigenous cotton seed. The rainfall was fair, the plants grew well, and yielded 140 lbs. per acre, a full crop in Nowlur and other villages being looked upon as producing 130 lbs. per acre.

Field No. V.—Has soil of three classes—good black, red and black, and poor shallow red. It was ploughed and manured and divided into plots and sown with cotton, country wheat, sorghum, English oats, barley, gram, jowari, &c. The only produce worth mentioning was wheat at the rate of 251 lbs. per acre; and jowari, at 270 lbs. per acre; all the rest were failures, more or less.

Field No. VI.—Consists of good black soil throughout, and nearly one-half could be irrigated from a well at one end. The land having been prepared and sown yielded jowari at 652 lbs. per acre, and wheat 188 lbs. per acre.

Field No. VII.—Is of a black soil and had been much neglected. It was prepared and sown, but did not give any yield worth mentioning.

In 1875–76 the season, which had promised to be a favourable one, and had helped the sowing of the early crops in good time, turned out to be unusually dry, and the early setting in of sharp cutting easterly winds in October destroyed all hope of a good yield. The best results, however, were the following:—

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Field No.	Extent Sown.		Names of Crops.	Produce per Acre.	Remarks.
	A.	G.		Lbs.	
1	6	7	Jowari Tur Mutt	444	Was manured previous year with poudrette, slaughter-house refuse, and crushed bones and lime
2	1	31	Sugar-cane	Rs. A. P. 140 13 6	Manured with slaughter-house refuse and poudrette.
	½	0	Lucerne	Lbs. 27,708	
3	8	14	Jowari Tur Mutt	338	Good dressing of poudrette, slaughter-house refuse, and farm-made manure was put on.
4	—		—	—	Fields under the tank all did poorly; some were not even cropped from being too wet at one time and too dry at other times.
8	½	0	Potatoes	4,214	Ploughed with English plough and dressed with 12 carts of poudrette.
9	0	31	Jowari	326	Dressed with patent manure at 3 cwts. per acre.

The rainfall in 1876-77 was very scanty, and the result on the farm did not, consequently, turn out so favourable as was expected, "especially as the fields had received a liberal dressing of manure."

Jowari yielded 183 lbs. per acre, "which, though "poor, was considerably better than the yield of many "of the surrounding fields." *Wheat* gave a produce of 228 lbs. on 2 acres 25 guntas of land. Another plot, which had been under cotton the previous year, and was dressed with village manure, produced 110 lbs. of wheat per acre. A fourth field, which received a good dressing of farm-made manure after having been thoroughly cleaned, yielded 320 lbs. of jowari per acre.

The half-acre which had been under potatoes the previous year, and another 1½ acre which had been under jowari (in all 2 acres), were put under potatoes. "All the plants grew remarkably well during the "early part of the season, and had rain fallen in "August, an exceedingly fine crop could have been "obtained. As it was, the yield came to 2,670 lbs."

A plot of 13 guntas was under American grass, and did well for a time; but in the end want of water become serious, and the supply gradually fell below demand. The out-turn was 5,666 lbs.

The farm was closed after the operations of 1876-77.

On the Salaru Cotton Experimental Farm 155 acres were cultivated, and 101 acres 26 guntas were fallow. The season was late, and although not quite unfavourable, the rainfall was only 4·71 inches.

Experiments were made with several varieties of cotton and the following are some of the best results obtained in 1873-74:—

Variety of Cotton.	Area Sown.	When Sown.	No. of Waterings.	Weight of Produce.
	A. G.			Lbs.
Sind native	6 5	12th June to 17th July	6	5,731
Ditto	6 21	8th „ to 18th „	6	5,179
American	1 10	28th „ to 6th „	6	1,035
Ditto	1 8	27th „ to 30th June	5	1,174
Ditto	0 8	10th July	4	220

Bajri was also tried on the farm, and the following table shows the best results. None of the fields were manured:—

No. of Waterings Given.	Date of Sowings.	Area.	Produce.	
			Grain.	Kirby.
		A. G.	Lbs.	Bundles.
Three	28th July to 4th August	7 22	4,525½	680
Three	7th „ to 29th July	4 22	4,496	914
Three, not finished.	8th „ to 4th August	10 39	7,633½	1,366

Sorghum saccharatum, sown 24th June in an area of 33 guntas, yielded 772 lbs. seeds and 195 bundles or 96 maunds kirby—*dry weighed.* This crop got the same amount of care as did the bajri crop, and was sown in the same kind of soil as the second of the above noted trials. Their respective yields may be compared thus:—

Bajri—

	Lbs.
Grain per acre nearly	790½
Grass „ „	5,678
Total	6,468½

Sorghum—

	Lbs.
Grain per acre	935¾
Grass „	9,774½
Total	10,710¼

Other crops were also grown—for instance, sugar-cane grown on 8 guntas of land yielded a produce of 420 lbs., and sweet potatoe on a plot of 33 guntas gave 760 lbs. of produce.

In 1875-76, in the first week of April, an acre of land on the farm well, which had been previously manured and ploughed with English plough, was sown with *Sind native cotton.* The plants, large and strong, began to yield in September, and the picking was over when the cold weather set in. The total yield was 1,884 lbs. of seed cotton, or 628 lbs. of clean staple.

Including the above acre, the total area under Sind cotton was 16 acres 21 guntas. The plants were fair, but they were much damaged by green fly towards the harvest time, and the total yield was 20,357 lbs. seed cotton, or clean staple 410⅔ lbs. per acre.

The American cotton also was attacked by green fly, and all but destroyed. The total yield of seed cotton was only 768 lbs., or about 221 lbs. per acre of clean cotton.

Sorgho was again grown, and yielded per acre—

	Lbs.
Grass or kirby	39,980
Grain	1,176
Total	41,156

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Bajri was sown during the rainy days in July, and the yield per acre of feeding material was—

	Lbs.
Kirby or grass - - -	10,672
Grain - - -	1,189
Total - - -	11,861

The season 1876–77 was a bad one for cotton, and the return generally in the district was much lower than that of the previous year. The highest yield of cotton obtained in the district was that from the Government fields, where 3 acres 19 guntas produced 5,496 lbs. of seed cotton, equal to fully 527 lbs. clean staple per acre.

Bajri.—Though the season was unfavourable for cotton, it was an excellent one for grain in that part of Sind, and the farm fields gave a return of 1,420 lbs. per acre, which is the highest yield yet obtained; "kirby or grass was also good."

Tobacco planted in half an acre in 1876–77 gave a produce of 1,365 lbs. This was the third crop off the same ground without any rotation being allowed.

"The first crop was luxuriant enough, but the *nicotine* principle seemed to be very deficient, and, as a consequence, the leaves were pronounced inferior by native merchants; it was with difficulty sold at Rs. 1–14 per pirdi of 168 lbs. The second year's produce, was a great improvement on the first, and sold for Rs. 2–12 per pirdi of same weight. The past year's crop was an improvement again on the previous season's return, and it sold at Rs. 5 per pirdi of 168 lbs. The varieties planted were common Sindi, Havana, Virginian, Shiraz, Connecticut seed leaf, and Kentucky."

Flax.—"One acre was sown with flax seed received from the Khandesh Farm. The ground which had previously borne an early crop of sorgho was well ploughed, manured, and watered, previous to sowing, after which it got no water; it produced 396 lbs. of very fine full-plump seed; but the fibre will be useless for any purpose except, perhaps, paper-making. The stems are much branched, and only from a foot to 18 inches long; 53 lbs. of seed was sown in this acre."

Punjab.—The efforts in the way of experimentalising proved fruitless. The Cotton Chandi Farm after having been open for some time was closed, and an agricultural farm at Amritsar* was started, and this also was closed after a trial of three years. It could not, however, have resulted in anything but failure, as the operations were commenced and carried out during those three years without either proper irrigation water or manure being provided for, and without any proper sheds for the cattle and sheep. The land needed to be improved, but the Lieutenant-Governor said after the third year's trial "it is inadvisable to go to any large expense in the construction of sheds for cattle or for planting and improving the land.* * *" The Lieutenant-Governor "is not unfavourably disposed towards these experimental farms," but he "considers that, if undertaken and maintained by the Government, they should be in situations and under circumstances which may render their success at least probable. His Honour believed "that the Amritsar Farm can never be anything but a failure." The circumstances being so unfavourable, it is not explained why the farm was started at Amritsar at all, and when started why it was maintained for three years without any large expense being incurred for planting and improving the land.

North-Western Provinces.—The Allahabad Farm† in 1873–74 consisted of 153½ acres of land, and rented 105½ acres to cultivators. The soil was naturally of a good character except where it adjoined the high land, most of it being level low-lying, and of alluvial description. The farm had no means of irrigation; but since the commencement of operations (two years previously) the land had greatly improved, owing to the use of the English plough. The improvement seemed "very evident to the native cultivators, as they have readily given for land, prepared by the English plough and manured with bazar sweepings, Rs. 55 and 60 per bigha for a period of 2½ years. The Government rent of this land yearly is Rs. 9 per bigha, or Rs. 22–8 for 2½ years; the cost of preparing the land with the English plough per bigha being about Rs. 2-2, and allowing Rs. 5 for manure, gives a total of Rs. 29-10, being a profit to Government of Rs. 30-6 per bigha, or more than double."

The following were the experiments carried out in 1873–74:—

Wheat.—Half an acre was sown on land manured with night-soil, and yielded 11 maunds, or at the rate of 22 maunds per acre. Land manured with bazar sweepings gave 16·25 maunds.

Sorghum Saccharatum was sown to the extent of 27 acres, and the fields being divided off, were treated each differently: a portion not manured, but ploughed with English plough, gave 352 maunds per acre; another portion, English ploughed in December and January, and manured with village sweepings, yielded 535 maunds per acre; and a third portion, English ploughed in June and July, and manured, gave an out-turn of 440 maunds per acre.

Jowar was tried on 11 acres: the land was treated as for sorghum, and sown in July. The yield of karbi per acre was 307 maunds 18 seers.

Barley was treated with Compton's patent manure, which was thrown broadcast at the rate of 1½ maunds per acre, the land being then ploughed with a native plough and levelled down with a plank. The barley was sown in the usual manner and yielded 12 maunds; while a neighbouring plot, which had been manured the preceding year with bazar sweepings, gave 11 maunds 12 seers. During the whole period of the experiment there had been no rain whatever.

Oats were sown on 14 acres of very sandy land of the poorest kind on the farm: 7 acres were English ploughed and unmanured, and 7 acres unmanured and native ploughed. The land was prepared like that for the barley and wheat. The out-turn on the English ploughed portion was 9 maunds per acre, and that on the other portion was 6 maunds per acre.

In 1874–75, 7½ acres were under *cotton*. The land selected was of third class quality, very sandy, and highly impregnated with lime. It was manured at the rate of 300 maunds of bazar sweepings per acre. A portion to be tried on the ridge system was twice native ploughed, and the portion on the flat was once English ploughed and three times native ploughed, and then levelled. The seed was sown from 21st to 23rd June, the plants were weeded three times and once hoed, and the first picking took place on the 26th October. The following were the results:—

—	Out-turn per Acre on the Flat.		Out-turn per Acre on the Ridge.	
	Maunds.	Seers.	Maunds.	Seers.
Dharwar cotton - -	2	25	5	32
Broach „ - -	1	3½	5	17½
Bulandshahr - - -	3	19½	5	4½

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* Mr. Lloyd, superintendent.

† Mr. J. Phillips, superintendent.

Sorghum and *jowar* were sown alternately to test their respective values as fodder plants. The land was treated as in the previous year, and the maximum out-turns were—

Sorghum - 625 maunds 0 seers per acre.
Joar - 362 „ 37 „ „

Other experiments produced the following results:

Name of Crop.	Area in Acres.	Description of Ploughing.	Manure per Acre.	Dates of Sowing and Reaping.	Quantity of Seed Sown per Acre.	Yield of Grain per Acre.		Yield of Karbi or Bhusa per Acre.	
						Mds.	srs.	Mds.	srs.
Bajra - -	17⅗	English -	300 maunds, bazar sweepings -	29th July - - 9th November -	3 seers	15	10	222	8
Maize - -	3/11	Dug - -	Poudrette - - -	1st July - - 25th September -	8 „	16	27	165	0
Wheat -	3/11	Dug -	Do. - - -	31st October - 31st March - -	52 „	19	10	33	0
Gram - -	7¼	Native -	None - - -	13th October - 20th March - -	46 „	6	33	25	0
Barley -	½	English -	300 maunds, bazar sweepings -	22nd October - 6th March - -	25 „	35	0	72	0
Do. - -	½	Do. -	Do. do. -	Do. - -	30 „	32	0	72	0
Oats - -	16	Do. -	Do. do. -	12th October - 15th March -	52 „	13	0	20	0
San - -	3/11	Do. -	Do. do. -	13th July - - 16th August -	30 „	16	20*	—	
Patsan - -	3/11	Do. -	Do. do. -	Do. - -	20 „	14	26*	—	

* Clean San.

In 1875–76 the operations were not satisfactory, and the farm, having been placed under the control of the Director of Agriculture, was maintained for the main purpose of proving the value of city manure when properly utilised. The area of the farm (153 acres) was reduced in 1876–77 to 55 acres; and as the farm was badly situated for experimental purposes, this area was considered ample. The other portion, consisting of about 100 acres of manured and ploughed land, was made over to the municipality in 1876–77 in exchange for an equal portion to be made over to the farm which might then undergo a similar process of manuring and improved cultivation. But the transfer having been made late in the season, no result could yet be reported.

On the reserved experimental area of 55 acres, the effects of deep ploughing and manure were ascertained. The crops for the experiment were sorghum, bajra (rain crops), and wheat, barley, oats (spring crops). The following were the results:—

—	OUT-TURN IN MAUNDS PER ACRE.	
	English Plough.	Native Plough.
FODDER.		
Sorghum, manured with sweepings -	300	226
„ „ poudrette (not trenched).	—	336
„ unmanured - -	265	218
Bajra, manured with bazar sweepings -	212	146
„ „ poudrette - -	—	128
„ unmanured - - -	207	125
GRAIN.		
Bajra, manured with bazar sweepings -	18	17
„ unmanured - - -	16	10
„ poudrette - - -	—	20½

The Bulandshahr Model Farm, under Mr. Simpson's superintendence, consisted, in 1873–4, of 150 acres of land divided into two plots. The lands, mostly of the class known as jungle, and mostly the outlying land of certain adjacent villages, were all conveniently situated for irrigation, there being one of the canal rajbahas running adjacent to each plot.

Cotton was grown on 52 acres of land, and was treated in five different modes. The largest yield of clean cotton was 164 lbs. per acre, and was obtained from land deep ploughed and manured and sown on the ridge system. The average yield of the total area was 97·84 lbs. A sample of 300 lbs., which was sent to Messrs. Colvin, Cowie, and Company, of Calcutta, was reported by that firm to be "fine white "Bhimargah class cotton, very free from strain and "leaf." The staple was said to be "¾ to ⅞ inch, silky, and of good strength." Its value was estimated to be in the London market at 6½*d.* per lb., and its worth in Calcutta for local consumption was about rupees 20 per maund.

Other products gave the following out-turns.

Name of Crop.	Area Sown.		Mode of Cultivation.	Yield per Acre.	
	Acres.	Roods.		Maunds.	Seers.
Wheat (white un-bearded).	3	3	Deep ploughed and manured.	23	3
Barley - -	3	1	Ditto ditto	15	6½
Oats - - -	2	2	Ditto ditto	33	8½
Peas - -	4	0	Ditto ditto	33	38½
Gram - - -	2	3	Ploughed in the Native manner.	27	38

A few other crops were grown; but the weight of the produce of some of them is not given in the report, while some others did not prove quite successful. The farm was subsequently abandoned.

A third farm, which had been started at Nawabganj in Cawnpore as a model farm, and had been worked by means of grants from Government, at a yearly loss, was placed in May 1873 under the charge of the collector of the district, and was used as a nursery for seeds, shrubs, and flowers. After two years' operations, under the new management, it was able to show a credit balance of Rs. 3,387-2-9.

In 1874–75 the chief field produce grown on the garden was pedigree wheat, oats, mangold wurzel, swedes, and New Orleans cotton.

The area sown with *pedigree wheat* was 8 acres and 2 roods, and the produce was, per acre, nearly

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Bengal.

1,200 lbs. of grain, and 22 cwts. 2 lbs. of straw or bhusa. The quantity of seed sown on the whole plot was 171 lbs. 8 oz. only.

Oats were sown on a plot of land measuring nearly 1 acre, and yielded 1,672 lbs. of grain and 2,064 lbs. of straw.

Mangold wurzel occupied an area of 1 acre 8 poles and gave a produce approximating[*] 14 tons, 11 cwts. The municipality bought a portion of this produce at 5 annas per maund. At this rate it would be worth Rs. 124 ; and as the cost of cultivation was Rs. 38–4–11, the profit would be Rs. 86–11–0.

Swedes occupied about ⅓ of an area, and produced approximately 8,420 lbs., at 5 annas per maund, which gave a profit of nearly Rs. 22.

Cotton of the New Orleans kind covered an area of ¾ of an acre in the second year of growth. The plants of the first year were cut down in June, and irrigated once in the cold weather. The yield was 378 lbs. of kapas, and about 280 lbs. of binola.

In 1875–76 the portion of the farm devoted to fruit trees (15 acres) yielded Rs. 1,102–8–9, and the outlay had been Rs. 350. The flower garden portion yielded Rs. 1,457–6–8. And the farm portion was mainly confined to the cultivation of tobacco, without any very good results, as the time given was short.

In 1876–77 the fruit and flower garden portions again gave a good profit; while the farm continued to afford encouragement in its results.

English and native ploughs were used on exactly similar land, and the results were, in eight out of ten fields, favourable to the English implement, and pre-eminently so in the case of sorgo, maize, and peas; but the results are not specified. The cost of ploughing with the English is also said to be less than that of ploughing with the native implement.

The next experiment was with canal irrigation. A field of about 1½ acres in area was watered consecutively for two years, ⅓ with canal, and ⅓ with well irrigation, a third and equal portion being left dry. The results with barley in the second year were—

	Lbs.
Well - - - -	1,642
Canal - - - - -	1,536
Dry - - - -	1,260

There was, however, too much rain to allow of a fair comparison between irrigated and dry land.

A portable sugar mill from Behar, patented by Messrs. Milne and Thomson, indigo planters, and adopted by six cultivators in Behar, was procured for trial on the farm. It proved "its superiority over the "native mill at once, by turning out double the quantity "of juice at half the cost of labour." The chief merits in the mill are its portability and simplicity. A large number are now being introduced into the Court of Ward's estates.

Bengal.—The many farms that had been started all proved fruitless, and they have all been closed. I do not give any account of their operations during the short time they were in existence, as Mr. Toynbee has already given a summary on the subject in his compilation of answers to the questions of the Famine Commission.

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[*] It had not all been taken up at the time.

CHAPTER I.—QUESTION 8.

CHAP. I. QN. 8.

What proportion of your population is agricultural, that is, either directly engaged in the cultivation of the soil solely, or in combination with some other occupation, or deriving their chief income from the land? And of this class what proportion live entirely by the profits of the cultivation of their own land, and what proportion support themselves wholly or in part by field labour for others.

PUNJAB.

PUNJAB.

Major Wace.

There are three main points in this question :—(*a.*) The proportion of the population which lives chiefly by agriculture. (*b.*) The extent to which that portion of the population combine other operations with agriculture. (*c.*) The extent to which agriculturists supplement the profits of cultivation of their own holdings with wages earned in field labour for others.

To enable me to answer this question and question 15, I have compiled from the census papers of 1868 a statement of population according to occupation, which is appended to the reply to question 15.

Division.	Per cent. of total population who are agriculturists.	Number of Agriculturists.	
		Total.	Adult males above 18 years of age.
Delhi - - - -	51	976,787	357,167
Hissar - - -	66	813,288	259,849
Umballa - - -	51	835,155	322,252
Jullundur - - -	61	1,504,685	446,469
Amritsar - - -	45	1,237,256	448,943
Lahore - - -	54	1,026,686	304,542
Rawalpindi - - -	60	1,317,640	349,589
Mooltan - - -	50	740,051	209,882
Deraját - - -	60	593,662	232,214
Peshawar - - -	62	638,372	173,942
Grand total -	55	9,683,580	3,104,849

The per-centage of the population therein returned as agriculturists is for the whole Province 55 per cent., of whom one in three are shown as adult males above 18 years of age (a proportion certainly too large).

The statement in the margin shows the number for each division.

As regards the next point, the extent to which the agriculturists combine other occupations with their principal livelihood, there are absolutely no statistics available. It is only possible to make a general statement on the subject.

The agricultural classes proper rarely combine agriculture with any other callings, except service in the army or police, and the calling of carriers. A large proportion of the bullock hackeries and camels of the Punjab belong to agriculturists ; and so far as this is the case they use these resources with no little spirit to help themselves over bad years. Similarly, in the northern parts of the Sind Ságar Doáb and adjacent tracts Trans-Indus, many of the agriculturists turn carriers in the months when agricultural work is slack, carrying salt and grain for the local traders, and sometimes making ventures on their own account; and thus they add materially to their means. They are equally ready to leave their homes and take work on roads and canals in order to tide over bad years. The great majority of the agriculturists, under such circumstances, show very great enterprise ; and are not at all the kind of men to sit starving at their homes when they can work as carriers or as labourers. But all the callings of the artisan they regard as beneath them, and rarely, if ever, adopt them.

As regards the third point also, the extent to which agriculturists supplement the profits of their own holdings by wages earned in field labour for others, there are no statistics available ; and a general answer must be given. When partial failures of crops occur, such failures as most affect the drier tracts and leave fair crops in adjacent more favoured tracts, the poorer agriculturists of the former usually go to seek harvesting work in the more fortunate districts. Such work is universally paid for by a share of the crop, usually about a twentieth. But saving such exceptional instances, the ordinary condition of agricultural villages is such as to give few opportunities for an agriculturist to supplement the income of his own holding by working for others. All the holdings are small, with few exceptions no larger than the actual cultivators can themselves look after; and for the same reason the cultivators have not the funds to pay for hired labour. Moreover, there is ordinarily so much neighbourly feeling among the cultivators of each village that, when a man does need help for some special work, his neighbours assemble and do it for him, asking no return except a good meal. The help one man needs to-day, his neighbour will need before long; so as occasion arises they all help each other. In villages thus constituted it will be readily understood that there is little opportunity for a poor agriculturist to add to his livelihood by wages earned from others, excepting only at harvest time.

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Punjab.

Major Wace.

Population of the Punjab according to Occupation, compiled from the Census Papers of 1868.

Division.	District.	Agriculturists.					Non-Agriculturists.													Grand Total.
		Proprietors.	Tenants.	Labourers, shepherds, graziers, and herdsmen.	Total agriculturists.	Total male agriculturists above 18 years.	Public servants, soldiers, priests, pandits and other professions. Pensioners, jágírdárs, house proprietors, and persons living on private means.	Merchants, shopkeepers, bankers and money dealers, agents, brokers, contractors and salt merchants.	Grain and flour dealers, grain parchers, millers, bakers, confectioners and dealers in sugar, grocers and sellers of wine, pán, drugs, tobacco, and spices.	Sellers of vegetables, fruits, and flowers, milkmen, butchers, poulterers, and fishmongers.	Wood and charcoal sellers, lime burners and sellers, and saltpetre makers.	Painters, jewellers, scent-makers, watchmakers, saddlers and leather dealers, printers, booksellers, and bookbinders.	Calico printers, weavers, dyers, threadsellers and spinners, embroiderers, woollen manufacturers, workers in bone and ivory, tailors, shoemakers, and cotton cleaners.	Tanners, oil makers, workers in cane and matting, rope and string makers, paper makers, lac workers.	Turners, carpenters, masons, stone-masons, blacksmiths and cutlers, coppersmiths, wireworkers, tinmen and tinkers and brass workers and dealers, hooka makers, gold and silver smiths, glass workers, potters, and brick-makers.	Innkeepers, servants, water-carriers, barbers, washermen, and sweepers.	Carriers, letters out of conveyance, and boatmen.	Labourers, coolies, beggars, prostitutes, travellers, and others.	Total non-agriculturists.	
DELHI	Delhi	164,611	98,737	6,937	270,285	135,121	33,321	26,250	29,430	9,715	1,596	5,869	63,379	12,021	37,183	65,191	7,121	47,489	338,565	608,850
	Gurgaon	201,586	195,906	2,040	399,532	115,881	32,277	7,247	35,997	6,518	462	1,633	54,524	20,345	28,817	45,252	1,632	63,110	297,809	697,341
	Karnal	226,429	77,853	2,686	306,968	106,165	34,642	12.894	28,062	3,480	779	642	43,831	39,151	33,509	54,728	7,742	44,499	303,959	610,927
HISSAR	Hissar	169,670	180,237	1,488	351,395	118,345	21,524	13,627	11,119	1,514	394	1,365	22,880	4,325	9,214	14,162	1,616	31,546	123,286	484,681
	Rohtak	173,865	116,319	22,240	312,424	96,284	20,803	24,112	12,617	4,021	235	1,038	38,152	33,472	25,660	33,420	2,458	28,502	224,490	536,914
	Sirsa	17,462	131,394	613	149,469	45,220	9,780	7,494	4,335	258	6	326	11,205	1,785	6,017	3,424	2,300	14,396	61,326	210,795
UMBALLA	Umballa	334,275	135,653	31,128	501 056	150,876	82,218	29,982	30,746	7,272	2,423	4,150	95,291	40,526	53,332	92,939	9,508	86,045	534,432	1,035,488
	Ludhiána	257,646	46,305	16,682	320,633	167,254	34,783	25,915	3,108	2,275	212	1,167	42,689	39,009	30,114	41,862	2,639	38,839	262,612	583,245
	Simla	12,390	961	115	13,466	4,122	3,789	1,168	1,781	710	65	45	2,255	57	1,090	5,974	81	3,514	20,529	33,995
JULLUNDUR	Jullundur	320,286	83,668	4,016	407,970	135,272	41,698	25,416	18,799	4,893	510	1,981	78,902	42,306	44,008	73,489	7,473	47,319	386,794	794,764
	Hoshiárpur	310,280	202,042	53,661	565,983	150,776	40,001	45,189	6,554	2,865	758	2,135	95,387	43,873	35,181	53,656	7,392	40,056	372,947	938,930
	Kàngra	412,829	114,257	3,646	530,732	160,421	34,275	18,232	5,085	2,957	262	608	41,120	20,186	20,332	18,206	4,164	47,723	213,150	748,882
AMRITSAR	Amritsar	280,475	88,872	48,400	417,747	103,742	86,422	29,852	27,323	7,653	1,068	2,202	139,411	1,174	66,703	162,053	18,002	123,981	665,844	1,083,591
	Siálkot	269,398	149,906	4,008	428,312	142,819	100,761	44,815	17,246	7,722	1,214	4,598	112,605	4,954	67,920	154,985	11,170	53,703	581,693	1,005,005
	Gurdáspur	200,988	120,312	74,897	396,197	202,382	35,134	26,583	9,784	2,126	670	1,288	59,041	7,382	8,810	38,024	15,222	55,001	259,065	655,262
LAHORE	Lahore	185,952	131,679	36,381	354,012	127,541	61,551	28,774	29,144	8,736	1,355	2,382	72,952	5,730	37,435	96,988	9,205	81,402	435,654	789,666
	Ferozepore	195,993	143,849	38,692	378,534	104,558	29,242	20,683	3,992	1,212	223	379	35,838	4,852	11,940	16,853	3,024	42,479	170,717	549,251
	Gujránwála	146,294	78,484	69,362	294,140	72,443	40,867	31,127	24,644	3,789	1.540	4,088	38,162	1.946	38,567	32,033	8,834	30,939	256,536	550,676
RAWALPINDI	Ráwalpindi	282,698	191,080	2,198	475,976	104,113	39,212	31,683	11,664	1,986	273	560	63,136	465	26,641	25,855	4,222	29,583	235,280	711,256
	Jhelum	216,798	85,796	280	302,874	89,356	25,226	19,168	8,931	1,292	131	257	51,340	5,092	23,098	20,576	16,071	26,932	198,114	500,988
	Gujrát	267,682	87,470	4,242	359,394	109,983	30,979	22,840	12,016	1,402	196	1,499	77,385	261	30,698	47,168	8,889	24,220	256,953	616,347
	Shahpur	115,950	49,414	14,032	179,396	46,137	18,553	30,583	6,681	405	1,295	178	44,291	1,126	20,187	13,147	5,687	47,237	189.370	368,766
MOOLTAN	Mooltan	61,646	124,873	9,870	196,389	69,006	23,385	38,995	4,425	3,939	1,960	698	54,643	3,591	22,789	29,066	13,935	77,758	275,184	471,573
	Jhang	38,055	119,619	6,975	164,649	30,842	19,591	22,961	4,227	948	289	212	47,231	2,747	20,653	19,277	6,700	38,542	183,378	348,027
	Montgomery	46,686	104,841	20,987	172,514	52,124	19,492	5,187	15,254	1,313	440	211	35,588	1,643	22,187	31,508	7,465	46,630	186,918	359,432
	Muzaffargarh	131,449	41,993	33,057	206,499	57,910	10,684	15,249	1,624	1,054	271	328	19,731	3,529	2,174	3,059	7,178	24,167	89,048	295,547
DERAJAT	Dera Ismail Khan	113,997	73,099	28,837	215,933	75,033	22,249	49,365	1,425	1,006	236	249	29,683	1,456	13,491	13,978	14,622	31,171	178,931	394,864
	Dera Ghází Khan	100,107	64,622	8,589	173,318	49,126	16,244	15,602	9,540	1,151	593	127	26,018	3,646	11,232	10,500	10,179	30,681	135,513	308,831
	Bannu	148,080	44,924	11,407	204,411	108,055	15,974	10,688	1,290	418	308	89	15,682	240	11,917	5,243	2,208	19,179	83,236	287,647
PESHAWAR	Pesháwar	168,093	99,171	3,417	270,681	71,595	54,699	24,309	9,939	6,605	712	1,194	42,975	954	22,708	25,717	4,082	58,577	252,471	523,152
	Kohat	99,138	77	1,042	100,257	28,426	16,978	4,691	560	428	112	90	5,290	872	8,960	3,548	2,046	6,560	45,135	145,392
	Hazárá	205,259	62,175	—	267,434	73,921	9,515	13,869	230	280	76	84	25,104	738	16,878	14,486	483	18,059	99,802	367,236
	Total	5,876,067	3,245,588	561,925	9,683,580	3,104,849	1,065,869	724,550	387,572	99,838	20,664	41,672	1,585,721	349,454	803,845	1,266,267	223,350	1,359,839	7,928,741	17,612,321

TOTALS OF DIVISIONS.

Delhi	592,626	372,496	11,663	976,785	357,167	100,240	46,391	93,489	19,708	2,837	8,144	161,734	71,517	99,509	165,171	16,495	155,098	940,383	1,917,118
Hissar	360,997	427,950	24,341	813,288	259,849	52,107	45,233	28,071	5,793	635	2,729	72,237	39,582	40,891	51,006	6,374	74,444	419,102	1,232,390
Umballa	604,311	182,919	47,925	835,155	322,252	120,790	57,065	35,635	10,257	2,700	5,362	140,235	79,592	84,536	140,775	12,228	128,398	817,573	1,652,728
Jullundur	1,043,395	399,967	61,323	1,504,685	446,469	115,974	88,837	30,438	10,715	1,530	4,724	215,409	106,365	99,521	145,251	19,029	135,098	972,891	2,477,576
Amritsur	750,861	359,090	127,305	1,237,256	448,943	222,317	101,250	54,358	17,501	2,952	8,088	311,057	13,510	143,433	355,062	44,394	232,685	1,506,602	2,743,858
Lahore	528,239	354,012	144,435	1,026,686	304,542	131,660	80,584	57,780	13,737	3,118	6,849	146,952	12,528	87,942	145,874	21,063	154,820	862,907	1,889,593
Ráwalpindi	883,128	413,760	20,752	1,317,640	349,589	113,970	104,274	39,292	5,085	1,895	2,494	236,152	6,944	100,024	106,746	34,869	127,972	879,717	2,197,357
Mooltan	277,836	391,326	70,889	740,051	209,882	73,152	82,392	25,530	7,254	2,960	1,449	157,193	11,510	67,803	82,910	35,278	187,097	734,528	1,474,579
Derajat	362,184	182,645	48,883	593,662	232,264	54,467	75,655	12,255	2,575	1,137	465	71,383	5,342	36,640	29,721	27,009	81,031	397,680	991,342
Pesháwar	472,490	161,423	4,459	638,372	173,942	88,192	42,869	10,729	7,313	900	1,368	73,369	2,564	43,546	43,751	6,611	83,196	397,408	1,035,780
	5,876,067	3,245,588	561,925	9,683,580	3,104,849	1,065,869	724,550	387,572	99,938	20,664	41,672	1,585,721	349,454	803,845	1,266,267	223,350	1,359,839	6,528,741	17,612,321

NORTH-WESTERN PROVINCES AND OUDH.

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North-Western Provinces and Oudh.

Mr. Elliott.

There has always been much doubt and discussion as to the proportion which the agricultural bears to the total population. The difficulty felt in answering the question arises mainly from two causes; one is that occupations are often combined, many persons adding a little agriculture to some trade or profession; the other, that caste and occupation are so closely connected among the lower classes that it is hard to separate them, and if a man returns his caste as lohar or kolie he is put down by the census clerks as a blacksmith or weaver, though he may have actually abandoned his hereditary profession, and live entirely by field labour or cultivation.

2. In the earlier census of 1865, in the North-Western Provinces, no further separation of the people was attempted than that involved in the broad classification "agricultural" and "non-agricultural;" and on that occasion 17,484,905 people were returned as agriculturists, being 59 per cent. of the entire population. In 1872 an endeavour was made to distinguish the landowners from the non-proprietary cultivators, and the enumerators were instructed when a person derived the whole or the greater part of his subsistence from the land, to enter in the occupation column of the returns the words "landholder or cultivator, as the case might be."* Treated in this way, the numbers came out as 17,376,967, or 56·5 per cent. on the total population; of these, 2,046,940 were returned as landowners, and 15,330,027 as cultivators.†

3. But besides those who are distinctly returned as landowners and cultivators, there is a large class who are included in Class VI., "indefinite," and whose occupation is vaguely recorded as being that of "labourers." The adult males belonging to this class are 1,448,087 in number. Those labourers who reside in towns are probably people who live by any kind of manual work; those who live in the villages are all, or almost all, employed in field work. In towns with over 10,000 inhabitants (whose total population is 2,194,000) the returns show 118,202 adult male labourers; it may therefore be estimated that in towns with over 5,000 inhabitants, whose total population is 3,093,000, the number of labourers will be about 166,000. These may be set aside as non-agriculturists, and the balance, or 1,282,000 adult males, may be taken as representing the number of field labourers in villages.‡

4. Those, however, who are acquainted with the constitution of an Indian village, and know how very few inhabitants it contains who are not engaged in agriculture, will be satisfied that even these figures do not quite represent the relative proportions of these two great classes of population. It has been stated, and probably may be stated without any great departure from accuracy, that putting aside the urban population, as roughly speaking entirely engaged in trades and professions, about 90 per cent. of the remainder, the rural population, are agricultural.

On this hypothesis the rural population of 9,000,000 males would be divided into 8,000,000 wholly or in part engaged in agriculture, and 1,000,000 of non-agriculturists. But even this residuum is very closely dependent on agriculture. Only a small portion consists of rich people who live on their rents, pensioners, merchants and bankers whose transactions are on a large scale and extend beyond the immediate neighbourhood, priests or members of learned professions who live by the custom and support of the rich. The great majority of rural non-agriculturists are the village servants, the watchman, the sweeper, the barber, the potter, the carpenter, the blacksmith, who work for the cultivators and are paid in grain when the harvest is ripe, and whose remuneration perishes when the harvest fails. The remainder are the village shopkeeper, the grain-parcher, the weaver, and such like, whose employment mainly depends on the prosperity of the villagers, and on their ability to pay for clothes, sweetmeats, and the like. From an administrative point of view, the interests of these trades and employments are so intimately interwoven with the interests of the agricultural community that they stand and fall together, and any great calamity like drought, which overwhelms the cultivators, involves the rural traders and artisans in the same ruin.

5. Hardly any of the district officers in their replies to this question have done more than copy in the census figures for their districts. Several, however, observe that the real number of agriculturists is considerably in excess of the recorded number; and Mr. Markham (Allahabad) and Mr. Harington (Unao) both adopt the view that after deducting the urban population, all, or almost all, the inhabitants of villages must be set down as agriculturists. The Superintendent of the Terai, in which district there is no town at all, considers the whole of his population to be agricultural.

6. There is another way in which a fairly good estimate of the agricultural population can be made. We know the area actually cultivated, and we can form a close approximation to the number of people who on on an average are required to cultivate it. The agricultural statistics of the Province are not, unfortunately, so advanced as yet as to be able to supply information as to the number and classes of tenants in all districts of the North-Western Provinces; but in several of the settlement reports, the number of the different classes of tenants, and the area they occupy are recorded with much care, and these statistics afford a sounder basis for calculating the number of the population engaged in agriculture than the figures recorded in the census. The following table brings together in one view the information which is scattered through these reports:—

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* Plowden's Census Report, 1872, paragraph 45.

† The adult males over 15 years of age are 10,352,562 in number, or one-third of the population, and are classified thus:—

	No.
I.—Professional - -	122,030
II.—Domestic service -	973,072
III.—Commercial - -	447,786
IV.—Agricultural - -	5,937,274
V.—Industrial - -	1,247,004
VI.—Indefinite - -	1,625,426

The urban population is about one million adult males, leaving nine millions of rural inhabitants. The indications of the census may therefore be shown thus:—

Urban - -	1 million males.
Agricultural - -	6 " "
Rural non-agricultural	3¼ " "

‡ Transferring these to the agricultural class, the occupation statement would stand thus:—

Urban - - -	1 million adult males.
Agriculturists - -	7¼ " " "
Rural non-agriculturists	2 " " "

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DISTRICT.	CULTIVATING PROPRIETORS.		TENANTS WITH OCCUPANCY RIGHT.		TENANTS-AT-WILL.		TOTAL.		Average Area.
	Number.	Area.	Number.	Area.	Number.	Area.	Number.	Area.	
Saharanpur - -	37,762	357,789	20,526	147,694	36,320	212,349	94,608	717,832	7·5
Bulandshahr - -	14,206	166,541	22,717	220,662	56,596	412,542	93,519	799,745	8·5
Alighar - -	15,193	204,938	28,380	258,749	43,752	433,485	87,325	897,172	10·2
Bijnor - -	20,916	102,517	37,851	278,331	46,030	209,958	104,797	590,806	5·8
Budaon - -	—	—	102,226	501,212	64,064	190,871	166,290	692,083	4·1
Bareilly - -	10,968	66,514	132,103	610,759	79,155	190,441	222,280	867,714	3·8
Shahjehanpur -	5,078	26,391	33,168	70,647	18,704	30,501	51,872	101,148	2·9
Mainpuri - -	15,602	88,582	80,641	369,693	28,535	129,821	124,778	605,121	4·2
Farukhabad - -	20,603	107,335	102,703	417,600	47,239	127,456	170,595	545,056	3·8
Etah - - -	13,531	99,184	71,459	379,651	32,859	129,732	117,849	619,329	4·9
Cawnpore - -	—	—	—	—	—	—	199,857	799,428	4·
Fatehpur - -	13,745	66,563	85,225	352,605	42,869	113,135	141,839	532,303	3·7
Jhansi - -	—	—	3,697	31,736	2,699	13,495	6,396	45,231	7·
Azamgarh - -	64,057	324,209	109,860	357,742	64,955	85,110	238,872	767,061	3·2
	231,661	1,610,563	830,554	3,997,082	563,777	2,278,896	1,847,928	8,580,727	4·64

From this it appears that in 14 districts comprising one-third of the area of the Province, 1,847,928 cultivators occupy 8,580,727 acres of cultivated land, or 4·64 acres apiece on an average. Assuming (as we fairly may) that the rest of the Province is cultivated by the same proportion of agriculturists, the total cultivated area, or 25,000,000 acres, would require about 5,400,000 cultivators. Each of these persons thus recorded on the land-roll of the Province is ordinarily the head of a family; and reckoning 4½ as the average number of a family, they would represent a population of 24,000,000.

7. There are three sources of possible error in this calculation. On the one hand it is sometimes the case that when a tenant or a cultivating proprietor dies, his sons continue to hold the land tenanted or owned by the father jointly, and without separating; in this case the tenure is counted as a single number in the village record, and may thus represent three or four heads of families instead of one. On the other hand, where a man holds two parcels of lands in two different villages, he must be counted twice over, as a resident cultivator in one case, as a non-resident in the other. The tendency, however, of these causes will be to neutralise each other. The third source of error is where the same person cultivates both as a proprietor in his own land, and as a tenant in another person's land; and this is probably very common, and may account for the discrepancy* between the census and the settlement figures, which is much greater in case of proprietors than in the case of tenants. What the exact amount of deduction is that should be made on this account, it seems impossible to say. But the settlement reports indicate pretty clearly what quantity of people are required to till the land according to the existing system. In the Farukhabad district (where peculiar care was taken over these records, with the special object of elucidating the question which is being discussed here), it was estimated (on the data afforded by an inquiry into the registers of a large number of villages) that about half the non-resident cultivators held land also in the villages where they resided; and that making this deduction, the average area per family was 4·2 acres. The average area per family given by the table above compiled for all the 14 districts is 4·64 acres. It appears, therefore, probable that this average may safely be assumed for the Province, and that the total agricultural population may be put at 5,400,000 families, or 24,000,000 of people. This will include the large tenants who hold more land than they can till themselves, and are forced to employ labourers, as well as the small mixed tenants who follow other occupations and take up a patch of land to occupy their leisure hours. The field labourers are, if we may trust the census returns, 3¾ millions, or 830,000 families, leaving 4,570,000 families having rights in the land. It is probable, however, that the landed families are more numerous than these, and that many of the adult males classed as labourers are the younger sons of tenants.

8. In order to test this hypothesis, or rather in order to arrive independently at some fresh data for a sound hypothesis, a special census was taken at my request by the Collector of Cawnpore, Mr. Wright, in 22 agricultural villages of his district, with a total cultivated area of 10,000 acres, and a total population of 16,090 people. This is a denser population than the average, for, whereas the 25 million cultivated acres of the Province support 27 millions of rural population, or 1$\frac{1}{12}$ persons per cultivated acre, here 10,000 cultivated acres support 16,990 villagers or 1$\frac{2}{3}$ persons per cultivated acre. Among these it was found that there were the following classes:—

Agriculturists only—	No.
Zemindars - -	526
Tenants - -	5,961
Labourers - - -	2,574
	9,001 or 53 per cent.

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* Mr. Plowden, in paragraph 49 of his Report, discusssed the reason why the census returns as to agriculturists disagree so much with the returns in the settlement reports. He compares the figures of three districts only. But the following table compares the two sets of figures in 13 districts:—

—	Census.			Settlement Report.		
	Proprietors.	Tenants.	Total.	Proprietors.	Tenants.	Total.
Saharanpur -	16,856	94,170	111,026	37,762	56,846	94,608
Bulandshahr -	7,299	141,269	148,568	14,206	79,313	93,519
Aligarh - -	8,988	146,040	154,028	15,193	72,132	87,325
Mainpuri - -	14,213	148,904	163,117	15,602	109,176	124,778
Farukhabad -	18,910	162,931	181,841	20,603	149,942	170,545
Etah - - -	9,487	134,559	144,046	13,531	104,318	117,849
Cawnpore - -	—	—	203,100	—	—	199,857
Fatehpur - -	7,823	115,892	122,715	13,745	128,894	141,839
Azamgarh - -	65,571	267,194	332,765	64,057	174,815	238,872
Bareilly - -	9,148	297,526	306,674	10,968	211,258	222,226
Bijnor - -	4,586	93,630	98,216	20,916	83,881	104,797
Badaun - -	11,216	193,384	204,600	16,855	166,290	183,145
Jhansi - -	7,240	39,754	46,994	1,105	6,396	7,501
Total -	181,337	1,835,253	2,217,690	244,543	1,343,261	1,786,861

As the census returns include all males over 15, that is, one out of three, and the settlement returns as a rule show only the one head of the family or one out of four and a half, the former number ought to be 50 per cent. larger than the latter. In the case of tenants this proportion is fairly observed and the two returns agree pretty well. But in the case of proprietors it is different. Moreover, there are many proprietors who do not cultivate at all: the census returns should show these and the settlement returns should not; so that the census number of proprietors ought to be still larger than the settlement number. But as a fact it is much smaller, and that in almost every district; it is possible that this is due to the fact that where a man is both proprietor and tenant, and is entered as such twice over in the settlement records, he is entered only as a tenant in the census returns.

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Mixed—
Tenants also following other trades - - 4,152 or 24·5 per cent.
Non-agriculturists following trades only - 3,837 „ 22·5 „

If we may assume the same ratio to exist throughout the Province, we should come to the conclusion that half of those who are nominally non-agriculturists, and who practice some hereditary trade or profession, do also, over and above this, follow agriculture. At this rate the classification of the population would be—

	Adult males.	Total population.
Urban	1 million	3 millions.
Agriculturists, including labourers - -	7¼	21¾ „
Those who follow agriculture, combined with trade or professions -	1	3 „
Those who follow trades and professions only -	1	3 „
	10¼	30¾ „

9. Two causes may have led to this mixture of trade and agriculture—one is land-hunger, eating into the trading classes and leading them to invest their surplus profits not in extending their trade but in the cultivation of land; the other is the unprofitableness of the hereditary trade, and the fact that being unable to make a living out of it, they are forced to fall back on the universal occupation which requires (as at present practised) little capital and no special knowledge, and which every inhabitant of Hindostan seems to take to as naturally as a bird to flying. The following statement showing the numbers of the more important occupations, will throw a little light on the matter: the first four columns show the people classified in the occupation statement of the census report:—

Class.	Order.	Name of order.	Trade or Profession.	Total number.	Number engaged in Agriculture also.
I. Professional.	3	Learned -	Priests - -	331	206
			Doctors - -	54	16
			Teachers - -	84	82
II. Domestic	5	Domestic service.	Sweepers - -	62	22
			Washermen -	217	133
			Barbers - -	405	212
			General service -	1,698	799
			Labourers -	564	261
III. Commercial.	5	Buying and selling, and lending money.	Money-lenders -	290	237
			Shop-keepers -	172	75
			Grain sellers -	258	210
			Cloth sellers -	25	12
V. Industrial.	10	Arts and mechanics.	Carpenters -	188	68
			Blacksmiths -	211	123
			Masons - -	103	46
			Workers in leather.	75	32
			Brick-makers -	45	45
	11	Textile fabrics.	Cotton-cleaners	131	71
			Tailors.	102	18
			Spinners and weavers.	427	75
	12	Food and drink.	Grain-parchers -	132	46
			Milk-sellers -	435	358
			Tobacconists -	45	9
	14	Vegetable substances.	Oil-sellers -	222	89
			Potters - -	69	34
	15	Mineral substances.	Goldsmiths and Jewellers -	118	15
			Braziers.	43	11
			Saltpetre makers	15	15
			Total.	6,521	3,320

In all probability there are few of these classes who have been led to become tenants of land (not owners) by the impulse of earth-hunger except the money-lenders, shopkeepers, cloth-sellers, those engaged in private service, and labourers, and perhaps the priests and pandits. With the rest another kind of hunger has been at work—the impossibility of living by their trade alone, and the necessity of filling up their unoccupied time by any employment that will bring profit, however little the profit may be. It is these classes who by their competition raise the rents of land and bring down the wages of labour; by their crowding on the land and by their readiness to accept terms which would not be remunerative to any one not so peculiarly circumstanced they take the bread out of the mouth of the true agriculturist; and his condition is most likely to be improved if he is relieved of this competition by the opening up of any new or enlarged field of employment for the artisans and mechanics.

10. There are no separate data existing as to the Oudh population; but the economic condition of the two Provinces is so closely similar that there can be little danger in applying to the one the conclusion arrived at in the other. The urban population of Oudh is smaller than in the North-Western Provinces (being 800,000 out of 11,200,000, or one-fourteenth instead of one-tenth of the whole): and the entire population is denser, so that there must be more people engaged in agriculture per cultivated acre than in the North-Western Provinces. This is borne out by the statistics embodied in the settlement reports which are compiled in the following table:—

DISTRICT.	NUMBERS.			TOTAL No.	AREA HELD BY			TOTAL AREA.	Average area per head.
	Proprietors.	Resident Tenants.	Non-resident Tenants.		Proprietors.	Resident Tenants.	Non-resident Tenants.		
					Acres.	Acres.	Acres.	Acres.	Acres.
Lucknow - -	16,452	87,801	26,627	130,880	58,995	347,566	73,713	480,274	3·67
Bara Banki - -	6,751	99,496	35,783	142,030	89,296	375,286	69,711	534,293	3·76
Rai Bareilly - -	10,530	87,631	23,624	121,785	65,387	290,037	72,930	428,354	3·51
Sultanpur - -	19,734	171,072	57,305	248,111	83,935	333,236	88,349	505,520	2·04
Pertabgarh - -	12,658	105,206	28,391	146,255	76,760	340,243	75,050	492,053	3·36
Gonda - - -	16,320	136,176	36,644	189,140	36,878	284,198	56,089	377,165	1·99
Baraich - -	—	173,674	45,363	219,037	26,023	658,420	151,754	836,197	3·81
Sitapur - - -	—	104,760	53,705	158,465	—	585,562	193,434	778,996	4·91
Total -	82,445	965,816	307,442	1,355,703	437,274	3,214,548	781,030	4,432,852	3·27

This shows that 4,432,000 acres, or rather more than half the cultivated area is cultivated by 1,355,743 persons; hence it may be assumed that the whole area of the Province or 8,300,000 acres is cultivated by 2,500,000 persons, holding 3¼ acres a head. If all these were separate families they would represent a population of about 11,000,000, or more than the whole rural population. It is clear, therefore, that in many cases the same person must hold more than one tenancy. Without a more minute knowledge of the

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system on which the record has been prepared, it is impossible to judge from these figures what the number of people engaged in agriculture is; but it is reasonable to suppose that the same ratio which held good in the North-Western Provinces will apply here, and that nine-tenths of the rural population, or about 9,000,000 out of 10,400,000, are engaged wholly or in part in agriculture. The population of the North-Western Provinces and Oudh may therefore be classified as follows:—

Population.	North-Western Provinces.	Oudh.	Grand Total.
Urban and non-agricultural.	3,000,000	800,000	3,800,000
Rural and following trades or professions alone.	3,000,000	1,200,000	4,200,000
Rural, and following trades or professions conjointly with agriculture.	3,000,000	1,200,000	4,200,000
Rural and following agriculture only.	21,750,000	8,000,000	29,750,000
Total -	30,750,000	11,200,000	41,950,000

11. There is no information given in these Provinces, compared to that supplied in Bombay and Madras, showing the areas of the tenures classified according to size; so that it is impossible to answer by direct figures the second part of the question, as to what portion of the population lives entirely by agriculture. But speaking broadly, it may safely be said that a cultivated area of five acres (or even four acres in the lower Doab, the Benares Province and the southern half of Oudh) will employ or support a whole family. The number who "live entirely by profits of "the cultivation of their own land" may therefore approximately be put at 30,000,000. There are very few tenants who combine cultivation on their own part with field labour for others, the field labourer being in this Province a class almost entirely apart from the tenant or ryot; but there are about 4,200,000 who combine agriculture with some trade or profession or other employment; a few of these live by working in the field of others for hire, but all are nearly as much dependent on the agricultural prosperity of the year, as if they were purely agricultural in their pursuits.

BENGAL.

Mr. Toynbee.

BENGAL.

Such figures as can be given in answer to the first part of this question will be found in the accompanying statement.

No figured information bearing on the second part of the question is available for Bengal. It may be said generally that, with the exception of dwellers in towns, the proportion of the population which is absolutely landless is very small, especially in the great rice-growing tracts of Eastern Bengal. The proportion is larger in Central and Western Bengal, and is perhaps greatest in Behar, especially in the districts of Durbhunga and Mozufferpore, which are the most over-populated districts of that Province.

When the next census is taken, it will perhaps be possible to record such information as will be useful in future famines.

STATEMENT showing the POPULATION with reference to Agriculture and pressure on the Land. (CENSUS OF 1872.)

DIVISION.	District.	Total population.	Total male adult agricultural population.	Per-centage of male adult agriculturists on total population.	Number of souls to the square mile.	REMARKS.
BURDWAN -	Burdwan - -	2,034,745	337,249	16·6	578	
	Bankoora - -	526,772	77,440	14·7	391	
	Beerbhoom - -	695,921	119,628	17·2	518	
	Midnapore - -	2,540,963	471,949	18·6	500	
	Hooghly with Howrah	1,488,556	192,976	13·0	1,045	
PRESIDENCY -	24-Pergunnahs * -	2,657,648	324,044	12·2	950	
	Nuddea - -	1,812,795	244,820	13·5	530	
	Jessore - -	2,075,021	427,020	20·6	567	
RAJSHAHYE - -	Moorshedabad - -	1,353,626	180,804	13·3	526	
	Dinagepore - -	1,501,924	362,352	24·1	364	
	Maldah - -	676,426	102,710	15·2	373	
	Rajshahye - -	1,310,729	241,784	18·4	587	
	Rungpore - -	2,149,972	547,099	25·4	619	
	Bogra - - -	689,467	170,057	24·7	459	
	Pubna - - -	1,211,594	205,053	16·9	615	
COOCH BEHAR -	Darjeeling - -	94,712	20,134	21·3	77	
	Julpigoree - -	418,665	82,535	19·7	144	
DACCA -	Dacca - - -	1,852,993	296,819	16·0	640	
	Furreedpore - -	1,012,589	196,704	19·4	677	
	Backergunge - -	2,377,433	498,690	21·0	482	
	Mymensingh - -	2,349,917	507,899	21·6	378	
CHITTAGONG -	Chittagong - -	1,127,402	158,273	14·0	451	
	Noakholly - -	713,934	127,780	17·9	458	
	Tipperah - -	1,533,931	314,500	20·5	578	
PATNA -	Patna - - -	1,559,638	212,529	13·6	742	
	Gya - -	1,949,750	264,306	13·5	413	
	Shahabad - -	1,728,974	270,959	15·7	393	
	Tirhoot † - -	4,384,706	973,299	22·1	691	
	Sarun - - -	2,063,860	427,810	20·6	778	
	Chumparun - -	1,440,815	342,822	23·7	408	
BHAGULPORE	Monghyr - -	1,812,986	277,541	15·3	463	
	Bhagulpore - -	1,826,290	331,925	18·1	422	
	Purneah - -	1,714,795	278,863	16·2	346	
	Sonthal Pergunnahs -	1,259,287	205,977	16·3	229	
ORISSA - -	Cuttack - -	1,494,784	212,248	14·2	470	
	Pooree - -	769,674	127,181	16·5	311	
	Balasore - -	770,232	138,693	18·0	373	
CHOTA NAGPORE -	Hazareebagh - -	771,875	143,452	18·5	110	
	Lohardugga - -	1,237,123	236,624	19·1	102	
	Singbhoom - -	415,023	74,666	18·0	92	
	Manbhoom - -	995,570	170,747	17·1	203	

* Including Calcutta.

† Now divided into two districts—Durbhunga and Mozufferpore.

CENTRAL PROVINCES.

Central Provinces.

Mr. Nicholls.

The returns of the census taken early in 1872, show a total population of 8,201,519. The agricultural population is shown as 3,058,022. Males above 20 years 756,350, with a corresponding male agricultural population of 800,000 or thereabouts under 20 years of age.

The proportionate number of females of all ages belonging to the purely agricultural families which give the above 1,556,350 males of all ages would be very close on 1,500,000.

The classification of the agricultural male population gives—

Proprietary landholders - -	71,213
Absolute occupancy tenants -	103,059
Occupancy tenants - -	211,843
Tenants-at-will - -	689,819
Ploughmen - - -	168,601
Farm servants - - -	259,546
„ labourers - - - -	63,900
Total -	1,568,021

Probably the casual agricultural requirements at sowing, weeding, transplanting and harvest times will engage another 1½ million hands for full 10 weeks in the year.

Landholders who are chiefly dependent on the profits of trade or money lending have been excluded in these census returns of agriculturists. Also some small portion of the occupancy tenants, such, for instance, as have petty holdings exclusively of kharif or of rabi land, in leisure times engage themselves as labourers for others, and more still resort to the carrying trade. The proportion of such persons among the tenants-at-will is much larger, but I have no statistics.

It is evident that among proprietary landholders and absolute occupancy tenants there will be under the laws of inheritance a considerable number of minors and of females. Among occupancy tenants, minors, and females would be fewer; the tenants-at-will would be nearly all or all adult males. The 168,601 ploughmen are no doubt all adult males, though often below 20 years of age. Among farm servants there would be very few women and no girls, but probably about half would be boys; the farm labourers would be mostly females.

The total of 1,568,021 would be the numbers of the purely agricultural classes who earn their own livings, and in addition support 1,490,001 members of their families, who cannot be classified as regular owners, holders, or workers.

The 1½ million of casual agricultural workers will embrace some portion of this 1,490,001 of the purely agricultural classes, together with a very large number of persons of all ages, and both sexes, whose general occupation is weaving, spinning, and the like.

BOMBAY.

Bombay.

Mr. Peile.

The following table embodies the best information procurable on the subject, extracted from the census returns of 1872. It cannot be ascertained how many combine other occupations, and there seems reason to believe that different principles of dividing proprietors from tenants have been followed in different districts, as in some the Government occupany ryots appear to be entered under proprietors, but in others only Khotes, Narwadars, and similar quasi-proprietors.

Male Adult Cultivators, 1872.

Districts.	Total Male Adult Population.	Proprietors not cultivating.	Proprietors cultivating.	Tenants.	Labourers for Wages, whether paid in kind or money.	Total.
1. Khándesh -	350,698	1,261	143,257	9,170	14,790	168,473
2. Násik - -	245,481	1,997	100,468	7,713	6,924	117,102
3. Ahmednagar	278,462	4,716	114,948	3,687	22,381	145,732
4. Poona - -	311,173	6,237	126,494	2,568	14,481	149,780
5. Sátára - -	401,422	2,626	211,846	3,903	5,834	224,209
6. Sholápur -	247,433	3,335	69,028	5,156	25,457	102,976
7. Belgaum -	330.102	4,837	58,169	82,056	37,011	182,073
8. Dhárwár -	359,517	7,314	47,388	88,781	54,339	197,822
9. Kaládgi -	284,665	26,910	33,249	78,738	33,728	172,625
10, Kanara - -	139,558	2,781	24,556	46,559	19,978	93,874
11. Ratnágiri -	310,250	2,576	62,911	147,390	3,295	216,172
12. Kolába - -	111,538	2,741	55,547	17,416	711	76,415
13. Tánna - -	280,420	2,893	140,171	12,204	18,629	173,897
14. Surat - -	196,252	415	10,478	61,505	31,650	104,048
15. Broach - -	124,128	362	52,423	5,080	6,904	64,769
16. Kaira - -	261,215	2,751	133,458	33,663	3,483	173,355
17. Panch Maháls	75,575	223	226	51,652	1,646	53,747
18. Ahmedabad -	293,958	4,535	50,401	61,547	6,006	122,480
Total - -	4,601,847	78,510	1,435,018	718,788	307,247	2,539,563

MADRAS.

Madras.

Board of Revenue.

Out of a total adult male population consisting of 9,660,973 persons, more than one-half, 4,878,890, are cultivators holding land either directly under Government or under zemindars. In addition to this great body of small farmers, there are upwards of two million adult males (2,071,602) classed as labourers, and Dr. Cornish, who compiled the census tables, states that probably more than three-fourths of these find employment in connexion with land.

Districts.	Number of Cultivators.	Number of Labourers.	Number of Property Holders.	Total.
Ganjam - - -	234,586	90,363	2,911	327,860
Vizagapatam - -	361,184	112,092	14,394	487,670
Godavari - -	267,789	96,867	23,401	388,057
Kistna - - -	243,388	55,088	8,240	306,716
Nellore - - -	200,360	118,249	5,732	324,341
Cuddapah -	222,557	99,830	11,694	334,081
Bellary - - -	273,828	94,952	3,056	371,836
Kurnool - -	128,353	72,771	11,343	212,467
Madras - - -	3,551	23,610	1,749	28,910
Chingleput - -	143,334	70,551	219	214,104
North Arcot - -	329,765	120,076	14,649	464,490
South Arcot - -	348,794	111,623	340	460,757
Tanjore - - -	256,366	96,483	73,731	426,580
Trichinopoly - -	219,271	70,587	490	290,348
Madura - - -	462,867	125,194	512	588,573
Tinnevelly - -	222,462	104,936	374	327,772
Coimbatore - -	256,130	138,679	149	394,958
Nilgiri - - -	6,963	3,930	71	10,964
Salem - - -	336,327	118,206	1,768	456,301
South Canara -	181,496	36,273	266	218,035
Malabar - -	179,519	311,242	1,491	492,252
Total - -	4,878,890	2,071,602	176,580	7,127,072

Chap. I. Qn. 8.

Madras.

Board of Revenue.

The following statement shows the entire agricultural population for each district, *i.e.*, the adult males together with women and children dependent on them for support, estimated on the assumption that the proportion of the number of adult females and children is the same for the agricultural population as for the total population of each district :—

Districts.	Population.	Number of Persons to a Square Mile.	Agricultural Population.	Per-centage of Agricultural Population to Total Population.
Ganjam (exclusive of Hill tracts).	1,388,976	534·6	1,087,115	78
Vizagapatam (exclusive of Hill tracts).	1,884,711	267·2	1,575,781	85
Godavari - -	1,592,939	255·9	1,254,612	79
Kistna - - -	1,452,374	180·7	954,937	66
Neilore - - -	1,376,811	162·7	972,830	71
Cuddapah - -	1,351,194	161·5	989,772	73
Bellary - - -	1,668,006	151·5	1,106,163	66
Kurnool - -	959,640	130·4	646,279	67
Madras - - -	397,552	14724·1	83,284	21
Chingieput - -	938,184	340·7	686,491	73
Nortn Arcot - -	2,015,278	282·3	1,473,708	73
South Arcot - -	1,755,817	360·3	1,493,893	85
Tanjore - - -	1,973,731	540·1	1,407,999	71
Trichinopoly - -	1,200,408	341·5	946,191	79
Madura - - -	2,266,615	238·5	1,956,673	86
Tinnevelly - -	1,693,959	327·3	1,058,312	62
Coimbatore - -	1,763,274	237·3	1,297,653	74
Nilgiri - - -	49,501	66·0	29,885	60
Salem - - -	1,966,995	262·9	1,512,543	77
South Canara -	918,362	235·4	680,157	74
Malabar - -	2,261,250	376·7	1,594,940	70
Total - -	30,835,577	257·9	22,809,218	74

The proportion of the population mainly dependent for support on agriculture to the entire population of the Presidency may thus be estimated at nearly three-fourths, and is certainly not less than two-thirds. No precise estimate can be made of the proportion of the agricultural population who live entirely on the profits of their cultivation. The number of cultivators shown in the first table attached to the question under reply shows that nearly half the population own lands, but it is difficult to say how far their income from their land is supplemented by earnings from other employments. The following table shows the number of registered ryotwar proprietors paying revenue to Government in each district for the year 1871–72:—

STATEMENT showing the Rent Roll of Ryotwar Lands for Fasli 1281 (1871–72).

Districts.	RYOTS PAYING UPWARDS OF 1,000 RUPEES.		RYOTS PAYING FROM 500 TO 1,000 RUPEES.		RYOTS PAYING FROM 250 TO 500 RUPEES.		RYOTS PAYING FROM 100 TO 250 RUPEES.		RYOTS PAYING FROM 50 TO 100 RUPEES.		RYOTS PAYING FROM 30 TO 50 RUPEES.	
	Numbers.	Assessment.	Numbers.	Assessment.	Numbers.	Assessment.	Numbers.	Assessment.	Numbers.	Assessment.	Numbers.	Assessment.
1	2	3	4	5	6	7	8	9	10	11	12	13
		RS.		RS.		RS.		RS.		RS.		RS.
1. Ganjam - -	2	2,116	2	1,379	32	9,995	386	51,760	1,728	1,09,737	3,238	1,18,701
2. Vizagapatam -	—	—	3	1,961	30	9,783	251	36,308	754	51,663	757	29,614
3. Godavari - -	22	28,697	112	72,589	548	1,83,204	3,731	5,57,526	6,496	4,49,944	6,962	2,74,506
4. Kistna - -	1	1,490	22	14,287	239	74,616	2,831	3,84,151	8,940	6,00,199	12,700	4,79,394
5. Nellore - -	7	10,220	44	36,488	205	49,255	1,525	1,81,079	3,907	2,73,072	6,196	2,06,366
6. Cuddapah -	—	—	1	503	46	13,991	612	82,250	2,724	1,81,257	6,211	2,18,966
7. Bellary - -	1	2,018	16	9,974	107	33,396	1,571	2,14,178	5,528	3,66,403	9,572	3,60,696
8. Kurnool - -	—	—	10	6,349	117	34,819	977	1,27,929	2,624	1,65,845	4,566	1,61,276
9. Madras - -	—	—	—	—	—	—	—	—	—	—	—	—
10. Chingleput -	5	9,871	46	30,436	231	78,816	1,540	2,16,213	3,722	2,66,968	4,541	1,87,743
11. North Arcot -	—	—	5	3,321	40	12,637	526	70,230	2,460	1,59,434	5,446	1,95,264
12. South Arcot -	8	10,657	46	31,187	232	76,046	2,326	3,15,023	7,665	5,05,999	12,644	4,82,517
13. Tanjore - -	205	3,19,778	655	4,48,492	1,730	6,01,062	5,872	9,01,678	9,364	6,58,369	11,334	4,32,701
14. Trichinopoly -	29	43,379	70	47,097	218	74,315	1,009	1,48,316	2,611	1,70,566	5,114	1,75,651
15. Madura - -	2	2,137	12	9,414	69	22,324	722	98,926	2,676	1,77,069	5,333	1,96,648
16. Tinnevelly -	68	1,11,112	148	99,104	591	2,01,156	2,961	4,34,324	5,928	4,12,219	8,377	3,01,943
17. Coimbatore -	2	3,517	13	8,778	75	23,962	570	80,196	2,026	1,34,063	4,218	1,53,428
18. Nilgiri - -	—	—	1	611	2	540	18	2,660	17	,224	25	857
19. Salem - -	—	—	1	534	13	5,170	246	33,598	1,301	82,010	3,620	1,32,857
20. South Canara -	20	29,771	88	57,307	353	1,16,569	2,078	3,02,317	4,620	3,19,766	5,262	2,03,909
21. Malabar - -	29	48,175	104	66,774	410	1,37,265	1,985	2,88,036	3,994	2,71,057	5,437	2,06,760
Total -	401	6,22,938	1,399	9,46,585	5,288	17,58,921	31,737	45,26,698	79,085	53,56,864	121,553	45,19,797

STATEMENT showing the Rent Roll of Ryotwar Lands for Fasli 1281 (1871–72)—*continued.*

Districts.	RYOTS PAYING FROM 10 TO 30 RUPEES.		UNDER 10 RUPEES.		TOTAL SINGLE PUTTAS.		JOINT PUTTAS.		GRAND TOTAL.	
	Numbers. 14	Assessment. 15	Numbers. 16	Assessment. 17	Numbers. 18	Assessment. 19	Numbers. 20	Assessment. 21	Numbers. 22	Assessment. 23
		RS.		RS.		RS.		RS.		RS.
1. Ganjam	11,169	1,93,175	17,477	64,709	34,034	5,51,572	3,720	1,15,138	37,754	6,66,710
2. Vizagapatam	1,231	23,387	1,203	5,475	4,229	1,58,191	426	32,315	4,655	1,90,506
3. Godavari	15,458	2,90,008	14,338	72,759	47,667	19,29,233	10,808	4,16,378	58,475	23,45,611
4. Kistna	36,180	6,55,464	38,379	1,88,218	99,292	23,97,819	38,331	7,96,404	137,623	31,94,223
5. Nellore	17,537	3,02,769	24,518	1,02,189	53,939	11,61,438	29,541	5,08,849	83,480	16,70,287
6. Cuddapah	26,496	4,37,759	87,197	2,97,867	123,287	12,32,593	29,231	4,02,159	152,518	16,34,752
7. Bellary	39,348	6,73,067	81,139	3,53,632	137,282	20,13,364	5,174	1,47,606	142,456	21,60,970
8. Kurnool	17,773	3,04,755	41,600	1,65,008	67,667	9,65,981	17,923	2,83,126	85,590	12,49,107
9. Madras	—	—	—	—	—	—	—	—	—	—
10. Chingleput	12,151	2,24,937	23,060	94,518	45,296	11,09,502	9,799	4,06,209	55,095	15,15,711
11. North Arcot	25,861	4,35,135	95,858	3,43,538	130,196	12,19,559	50,497	7,38,384	180,693	19,57,943
12. South Arcot	54,182	9,25,230	155,099	5,87,728	232,202	29,34,387	42,421	5,35,982	274,623	34,70,369
13. Tanjore	30,267	5,47,661	69,196	2,50,266	128,623	41,60,007	1,270	48,784	129,893	42,08,79
14. Trichinopoly	23,245	3,53,066	98,400	2,85,522	130,696	12,97,912	8,536	1,29,688	139,232	14,27,60
15. Madura	26,213	4,34,375	94,537	2,99,146	129,564	12,40,039	10,736	2,33,885	140,300	14,73,920
16. Tinnevelly	30,015	4,97,432	80,627	2,77,392	128,715	23,34,682	14,030	5,90,513	142,745	29,25,195
17. Coimbatore	25,560	3,96,525	79,215	3,57,651	111,679	11,58,120	103,528	13,41,215	215,207	24,99,335
18. Nilgiri	268	3,947	1,712	5,201	2,043	15,040	882	9,872	2,925	24,912
19. Salem	31,767	4,82,840	103,055	3,98,000	140,003	11,35,009	66,012	7,26,972	206,015	18,61,981
20. South Canara	10,141	1,91,090	15,403	54,767	37,965	12,75,496	—	—	37,965	12,75,496
21. Malabar	20,854	3,53,537	129,737	3,59,316	162,550	17,30,920	2,270	35,854	164,820	17,66,774
Total	455,716	77,26,159	1,251,750	45,62,902	1,946,929	3,00,20,864	445,135	74,99,333	2,392,064	3,75,20,197

From the above statement it appears that there are in this Presidency nearly 2½ millions (2,392,064) of ryotwar proprietors. Persons who own lands in different taluks and even in different villages are registered more than once, but such cases are not very numerous and need not be taken into account in a rough calculation. Setting aside proprietors under joint puttas there are nearly two millions (1,946,929) of ryotwari proprietors, of whom a million and a quarter, or nearly 67½ per cent., pay less than Rs. 10 to Government, and nearly half a million (455,716) between Rs. 10 and Rs. 30. It seems certain that none of the former and only a portion of the latter can subsist solely on the profits of their cultivation; and, as the state of things is probably not very different as regards Zamindari and Inam lands or amongst tenants in ryotwari districts, the Board think it may safely be said that three-fourths of the peasant proprietors and small farmers of the Presidency (say 3¾ millions) work as agricultural labourers for others or follow non-agricultural occupations.

It is not easy to determine the proportion that follow non-agricultural occupations. The census tables show amongst the cultivators—

Brahmans	132,443
Kshatriyas	42,092
Chetties (traders)	43,772
Shepherds	332,380
Artisans	24,624
Accountants	11,840
Weavers	33,271
Potters	16,846
Fishermen	152,714
Toddy drawers	173,484
Barbers	16,422
Washermen	18,990
Total	998,878

For the reasons given above it may be assumed that of these about three-quarters of a million are not supported solely by the cultivation of their own land, and it may also be assumed that by preference they would follow the specific occupation of their caste, rather than work as field labourers. This, however, it would not always be possible for them to do, as, for instance, in he case of the 51,704 fishermen in the inland district of Bellary, and it will probably suffice if half a million is deducted from the 3¾ millions given above on account of non-agricultural occupations. If to the remaining 3¼ millions be added the two million labourers who hold no land of their own there is a total of 5¼ millions out of little more than seven million adult male agriculturists, and assuming the proportion of women and children to be equal throughout, it may be said that about 75 per cent. of the entire agricultural population of the Presidency are supported wholly or in part by field labour for others.

With regard to the expression "field labour for others" the Board desire to explain that they have considered it to be applicable within the meaning of the question to the common practice on the part of small proprietors of cultivating land owned by others on a kind of temporary tenancy, retaining a share of the produce as their remuneration.

NOTE BY SECRETARY.—The Board's conclusion may be summed up thus:—

That out of five millions of "the landed," representing, say, a population of 16,000,000, there are—

- 1¼ million males (say four million population) who live by land entirely.
- ½ million males (say 1½ million population) who live also by trades.
- 3¼ million males (say 10 million population) who live partly by labour for others.

Total 5 millions.

Besides two million males, or 6½ millions population, who live solely or mainly by labour for others.

Leaving 2½ million males, or eight millions population who live in other ways and are landless.

Of the 5 millions 2½ millions are ryots on Government land,

Add	1	million tenants under them.
,,	½	junior members of families.
Balance	1	million ryots on Zamindari lands.

CHAP. I. QN. 8.

CENTRAL INDIA.

CENTRAL INDIA.

Mr. Wingate.

The information is scanty. In Bhopal five-eighths of the population are said to be agricultural, and of these one-eighth live entirely by land and one-fourth entirely by field labour. In the Mânpur pergunna there are 585 regular agriculturists; of these 94 live by land only, 341 partly by land, and 150 are field labourers. For Baghelkhand, Lieut.-Col. Bannerman says:—

"I can only estimate this roughly, but it is supposed that two-thirds of the entire population may be considered agricultural, of which probably half are directly engaged in the cultivation of the soil and half derive their chief income from the land. These latter do not personally engage in cultivating the land, for the custom in Baghelkhand is that the 'Brahmins,' 'Chuttrees,' 'Ihahoors,' 'Bais,' never touch the plough, and the land is cultivated by 'Sudras,' such as 'Kachees,' 'Kumbis,' 'Kols,' and 'Gonds.' Of the latter *a few* live by the profits of the lands cultivated by themselves, but the majority are entertained in service on various terms by the classes above mentioned."

HYDERABAD.

HYDERABAD.

Moulvie Mahdi Ali.

In the absence of proper census returns, no correct and complete reply to this question can be given. Efforts were however made to collect all possible information on the subject that could be gathered by causing the census of a number of villages to be taken in several districts.

The following statement embodies the result of the information thus collected:—

Number.		DISTRICT.	Per cent., with regard to the total population of the villages under inquiry.							
			Khotedars* who depend solely on the cultivation of their soil.	Khotedars* who are engaged in cultivation, together with other occupation.	Shikmidars (Subtenants).	Total of Tenants.	Labourers solely engaged in field labour.	Labourers in part supporting themselves with field labour.	Total of Field Labourers.	Grand Total of Agricultural Population.
1	2	3	4	5	6	7	8	9	10	11
1	lingana.	Medak - - -	34·27	12·70	3·62	50·59	8·73	11·01	19·74	70·33
2		Sirpur Tandur -	30·59	18·77	13·70	63·06	6·07	9·12	15·19	78·25
3		Khammum - -	35·54	18·41	11·67	65·62	9·86	11·07	20·93	86·55
4		Yelgandal - -	41·74	15·13	11·12	67·99	8·77	9·19	17·96	85·95
		Average of Telingana	35·53	16·25	10·03	61·81	8·36	10·09	18·45	80·27
5	Mahratwari.	Aurangabad -	38·52	2·65	13·28	54·45	7·10	5·21	12·31	66·76
6		Bid - - -	41·83	11·38	13·66	66·87	4·26	5·61	9·87	76·74
7		Raichor - -	39·80	8·63	5·07	53·50	5·97	12·31	18·28	71·78
8		Shorapur - -	36·66	4·03	12·68	53·37	3·01	20·56	23·57	76·94
		Average of Mahratwari - - -	39·20	6·67	11·17	57·05	5·08	10·92	16·007	73·05
		Average per-centage of each Province	37·37	11·46	10·60	59·43	6·72	10·51	17·23	76·66

* *i.e.*, holders of land on leases direct from Government.

These figures have reference only to the class of persons who are directly engaged in the cultivation of the soil, or support themselves wholly or in part by field labour for others. Those remaining are that class who, without personally conducting agricultural operations, derive their chief income from the land. These are the jagirdars and maktadars, who, like zamindars, lease out their lands to cultivators and receive certain fixed amounts in return. Having regard to these figures and various other circumstances, the proportion of the agricultural population may be estimated at 75 per cent. for the Mahratta country, and 80 per cent. for the Telingana. Of this proportion about 62 per cent. live entirely by the profits of the cultivation of their own land, and nearly 18 per cent. support themselves wholly or in part by field labour for others, in the Telingana country; and in the Mahratta country, these may be set down at 58 and 17 per cent. respectively. These figures are based on the returns of the special census taken by the talukdars in certain villages. This census was taken only in villages containing a purely agricultural population, and in no case in *kusbas* and towns. Hence the per-centage of the agricultural population is somewhat high. But with respect to the country at large, it may be assumed that the agricultural population in the Telingana country amounts to about 70 per cent., and in the Mahratta country to about 65 per cent.

CHAPTER I.—QUESTION 9.

What is the ordinary economic condition of the portion of the agricultural population directly engaged in the cultivation of the land and possessing any proprietary or occupancy interest in land? Illustrate your reply by giving the actual facts as to a few typical instances of such persons taken from four or five different villages in several districts of your Province. State, with regard to each, what area of land he holds for tillage or grazing, what his family consists of, what amount of food-grain and what value of other produce he raises on an average off his land in a year, what rent or revenue or cesses he pays for his land, what expenses he incurs in hired labour (other than his own labour and that of his family), what amount he spends in a year in purchases of necessaries, which he cannot produce on his land, what kind of house he lives in, how many rooms it possesses, and how many out-houses, what quantity of cattle or other live-stock he possesses, what other property, and what stock of grain. How does he dispose of any surplus income, whether by hoarding or lending his money, or investing it in ornaments, or spending it on marriage ceremonies, or otherwise? What are his debts, and to what are they commonly due? State what proportion of the agriculturists of your district you believe to be in debt, and what proportion their average indebtedness bears to their average yearly income. Endeavour to obtain the opinions on these points of well informed and trustworthy native residents of different districts, and in submitting such opinions explain the position of your informants, and the probable means at their command of forming correct conclusions.

PUNJAB.

The instances examined by me are nineteen in number, as follows:—

Proprietors - - -	7
Tenants with occupancy right -	7
Tenants-at-will -	5

The proprietors are men of different parts of the district, chosen as living in different assessment circles, and thus as being as regards soil and irrigation at least in different circumstances. The first in style of living probably, though not really the best off, is the proprietor of land in a canal village. The instance given (No. 6) is that of a man somewhat below the average, the fact being that the village where he lives has suffered from "shor." Twenty years ago the canal villages were in the height of prosperity, pakka houses were built, the common funds of the proprietors often raised a substantial travellers' house used as a village assembly room (the chaupár or chaupál). The oxen, fed on sugar-cane stalks, gur, and the abundant fodder of canal irrigated fields, increased in size and strength; the people themselves adopted a more luxurious style of living and dress. But this prosperity has waned; the crops are not what they were, the soil is enfeebled, and in many places destroyed, at least for the time. The people, however, do not easily come back to their primitive simplicity, and the consequence is that there is in the canal irrigated district a far greater amount of indebtedness than there would have been had the old circumstances of expenditure been unaltered. Still, where the canal has been used, and not abused, there is yet even a prosperity not equalled anywhere in the district. The realignment of the Jumna canal will probably keep this prosperity for many villages, but a safer and simpler means of abating the evil lies in the restriction of canal irrigation and by keeping the main channel dry for some months in the year to allow the spring level to sink again. Much has been written, and something is now being done, about the improvement of the drainage, but it were well to prevent as well as to cure. The holding of the canal proprietor is not generally larger than the ordinary size throughout the district, 12 to 15 acres, but he gets richer crops, especially sugar-cane, off the ground. In a large canal village it is not uncommon to find a mass of cultivation of this crop, sometimes 50, 75, or 100 acres standing together, with regularly marked narrow lanes well fenced in leading from one end to the other. Sugar-cane is expensive alike for seed, planting, care while growing, and expressing when ripe. But it well repays the cost, and is in fact the great stand-by in those villages where it is grown. Sugar-cane is grown rarely in the khádir chak and in some villages in the bángar, but nowhere does it come to such a size as in the canal villages.

The other chaks have proprietors for the most part in moderate circumstances. The Kohi chak probably (see No. 14) is the poorest, and there the people are sometimes very low in their standard of living. The houses are mere chappars of thatch; sometimes mud walls support the thatch; the food consists mainly of the inferior grains, and the dress often is only a piece of dirty coarse cotton cloth in the form of a "chádar." The general average, however, is better than this. No. 1, it is true, is in debt, but his style of living is something like comfort, and it is because he has a large family for his moderate holding that he becomes embarrassed. Had he fewer mouths to feed, he might be as well off as the shrewd Ját No. 4, who, in a holding of only seven acres, has managed to save money, and knows how to use it when saved. No. 9, though under a temporary cloud, may perhaps get right again; in an ordinary year he probably pays his way. His house is not much certainly, but it is better than the Kohi Gujar. If it were not for the cows of the latter, he would hardly manage to live.

The general condition, then, of the proprietor may be described as moderately prosperous; there is little margin for him to fall back on in bad times, and his style of living is somewhat low, but in ordinary years and with ordinary expenses, he generally pays his way. A marriage, a funeral, or bad luck with his cattle, may bring him into difficulties; but these, too, he may extricate himself from in many cases. There is reason to believe that legal fees are in a few instances the cause of embarrassment, if not of ruin.

The tenants with occupancy rights, and still more the tenants-at-will, might perhaps be supposed, as being inferior in station, to be inferior in circumstances also to the proprietor. This, however, is not always the case. The tenant with occupancy has sometimes (as in case No. 2) an auxiliary income from "parohitái," priestly dues, which enables him not only to pay his way but save money. In the case in question this auxiliary income becomes most important. The number of such privileged persons is necessarily limited, but without such adventitious aid the tenant is often a man of substance. Whether he will remain so is a matter of doubt. Up to the present time he generally pays only the revenue-rate of the village on his land, *i.e.*, he pays no rent, so that, provided his holding is of a fair size, he may be as well off as the proprietor of other land in the same village. There seems little doubt, however, that when the new assessments shall be announced, a general attempt will be made on the part of the proprietors to obtain rent, or an enhancement of rent, and this must lessen the profits of the tenant.

The position of the tenant-at-will is very unequal. He, too, at present often pays only the revenue-rate but on the other hand he sometimes has to give a competition rent. The pressure of population is felt more directly here than in any other class. A family of strong men, or having active women, may do well, but whenever the non-producing part of the house becomes

P.I. Qn. 9.

UNJAB.

Mr. aconachie.

Delhi.

large, distress is sure to follow. The mâli of Rathdhaneh (instance No. 3) gets together, in one way or another, a pretty large income, but the large quantity of food requisite to keep his 17 people going makes it a hard matter to keep out of debt. Probably by the time the boys come to working age, they will find their earnings embarrassed with considerable debt. The limit, however, is not far off; when the money-lender ceases to give credit, the house breaks up, and the men scatter to earn their living by hiring themselves out. The difference in status arising from advantages of irrigation is shown in instance No. 8, where a tenant-at-will on 17 acres contrives to pay a "revenue" of Rs. 62 odd, and Rs. 40 more "water-rent." The "revenue" of course includes rent paid to the proprietor. With this heavy charge on him, he yet pays his way, and is on the whole in comfortable circumstances. This being so, it is no wonder that the proprietors expect to be well off, and are disappointed when they find their former prosperity gone.

I forbear to dwell on details at any length, for I am sure that my experience is not sufficient to give exact estimates, and these I imagine are the only useful things of their kind. The instances I have collected speak for themselves, and are, I believe, as valuable and trustworthy as they are interesting. I would draw attention to the various ways in which the income from direct cultivation of the land is eked out by auxiliary means.

(1.) The proprietor in Rathdhaneh (No. 1) makes Rs. 54 by ghí sold; the tenant-at-will in the same village (No. 3) Rs. 24; (No. 4) a proprietor, makes Rs. 36; the same amount comes to the Gújar proprietor (No. 14).

(2.) Brahmani dues are great helps to No. 2 and No. 7, who are both tenants with occupancy, while for No. 16, the Brahman tenant-at-will in the Kohi chak, they constitute half his income.

(3.) Money-lending is possible only in the case of profitable farming, but this is not uncommon. It obtains only where the men are shrewd and thrifty. In fact, seeing how some Játs amass capital, and prosper as usurers, one is inclined to think that differences of soil are less important than differences in mental and moral habits.

(4.) Lámbardár's dues are a help, but a small one, and the social habits engendered by possession of the dignity are more than a counterbalance to the income thus obtained.

(5.) Selling cow-dung is a help in some parts, especially near towns, in the case of the khadir tenant-at-will (No. 19); this with grass sold brings in Rs. 2 a month.

(6.) Letting out gáris on hire brings in something, Rs. 12 to No 1, and often there is more than this; chiefly however, near towns.

(7.) The last item is hire for labour, which, of course, when regularly pursued, is fairly lucrative for an able-bodied man. The earnings of boys in the Kohi chak as herdsmen seem noticeable.

I pass on to the last matter on which report is required. The causes of indebtedness are not generally obscure; in order of importance they may generally be put as follows:—

1. Expenses of marriages and funerals.
2. Vicissitudes of season, as regards crops.
3. Ill-luck with cattle, or personal illness.
4. Severity of Government revenue.

All these matters have often been dwelt on, and I am not likely to strike out anything new. The question of sumptuary laws will probably be considered; perhaps, too, the idea of a rough assurance association to afford compensation in cases of death of cattle is not original. Both matters seem to me worthy of consideration. But I think it better to pass on to the last point—indebtedness caused by the severity of Government revenue. I think this uncommon, but I believe it exists, and more than anywhere else in the canal villages. Some of these have been paying Rs. 3 on every cultivated acre for the last thirty years. Now this may be borne in fair years, though it is a great burden, and forces on a system of cultivation which cannot but injure the land. But in bad years, or when water is scarce or not given at the right time, the canal village is worse off than any. The canal irrigation, at the style in which it has been going on here for many years past, would, I believe, ruin any land in time. It is of no use to say that the people are to blame for flooding their land so; their reply is cogent; we must do so to sustain the heavy Government demand. The inelasticity, too, of the canal water-rent is against them, so that, as a matter of fact, canal irrigation, which should be the most certain protection of a high average, and of that average from wide variations, often introduces an element of speculation into the matter, which would at first sight seem astonishing. The inference to be drawn seems to be that Government has not properly discharged its duties as joint trustee of the land with the Zamíndárs. If they have not discretion sufficient to prevent a far distant but surely coming destruction of the powers of the soil by a moderate use of the immense power of irrigation from canals, that duty and that responsibility, nevertheless, remain with Government. The remedy is simple; allow only moderate irrigation, and assess accordingly. Severity of revenue in other than canal villages is rare. The Government demand is inelastic, and we have failed to teach the people as yet to prevent the strain in bad years by forethought and thrift in good seasons. But the adjustment is generally accomplished, though in a clumsy and costly manner. The money-lender gives help in bad seasons, and is repaid in good; the greater cost is found in his exorbitant interest. If we push this further, we find that the "middleman" class is numerous; that it is favoured by superior intelligence and social custom. And this brings us to what perhaps is not the greatest cause of indebtedness strictly speaking, but the greatest cause of increase of indebtedness, viz., the power of the bania and money-lender over the Zamíndár. The subject is a well worn one, and it seems unnecessary to do more than, having noted the distinction above, to record my assent to the general opinion.

This reply is of course not exhaustive. It has been written rapidly, but as it deals with matters which must form in a great measure the intellectual pabulum of officers whose work lies chiefly among Zamíndárs, the substance of it has been formed and corrected by daily experience.

Wilson.

gaon.

Difficulty of satisfactory calculation.—From the instances I was myself able to collect and from comparison of those given by the different superintendents, I find that it is indeed extremely difficult to give with anything like exactness a detail of the income and expenditure of an ordinary agriculturist. The area of the holding and the amount of revenue and cesses or rent payable thereon can be given exactly, but the amount and value of the produce is subject to very great fluctuation year by year, according to the nature of the seasons. Still more difficult is it to calculate even the average expenditure of the family, for no account is kept except of the few things obtained on credit from the village shop-keeper, and the agriculturist himself is incapable of making anything but a very rough guess at the amount he has actually spent during the past year; and here again the fluctuations are so great, and depend so much on motives difficult to analyse, that it is well nigh impossible to strike a satisfactory average.

Present condition of district abnormal.—It seems necessary to note that the condition disclosed by the 5th and 6th columns of the accompanying statement (giving a description of the agriculturist's house, cattle and chattels, and the amount of his debts) is not to be taken as the normal condition of the agricultural community in the Gurgaon district. The kharíf crop of 1877 was almost a total failure, and the rabi of 1878 was much below the average, so that all but the most well-to-do agriculturists have lost a large number of their cattle, and have been obliged to part with all their luxuries, and not a few of their necessaries, and to increase their debts. The inspection of their houses was made just before the threshing of the present kharíf crop, so that the quantity of grain found in stock was very small: indeed many were then living on handfuls of the ripening grain gathered from their fields. It is to be feared that this kharíf and the ensuing rabi will not enable those who have become indebted during the scarcity of the past year to recover their former position, and will barely suffice to prevent them from sinking deeper in the quicksand.

No general description possible.—In a district such as this, containing such a variety of soil and caste, and even climate, it is necessary to divide the agricultural community into classes, and describe their circumstances in some detail; no general description of their ordinary economic condition would apply to the whole community with any approximation to exactness.

Factors in the economic condition of the agriculturists.—The circumstances which determine the condition of an agriculturist come, in order of importance, as follows:—

1. *Caste.*—As a general rule, whatever be the nature of the soil he cultivates, or the incidence of the revenue he pays, the caste of the agriculturist, which determines his habits and customs and natural disposition, will determine his economic condition. At the head of the prevalent castes in this district I would place the Ahírs, as the most industrious, thrifty, and prudent; though much of the land occupied by them is of an inferior description, and the incidence of the revenue in Rewári tahsíl, where most of the villages are owned by them, has for 30 years been very high, as compared with the rest of the district, they have, by unremitting toil, compelled the soil to yield them a wonderful amount of produce, and have by prudent thrift kept themselves and their lands free from debt. Next to them come the Játs, who own many villages in the east and north-east of the district. Their land is very fertile; and in Palwal tahsíl, where they form the chief portion of the land-owning class, the incidence of the revenue has been hitherto extremely light. In industry and thrift they are inferior to the Ahirs, though superior to other castes; while on the whole very well-to-do, they have not been careful to keep themselves free from debt and their land from mortgage. After them come the Rajputs, owning land chiefly in the centre of the district, and the Brahmans, scattered here and there, but neither caste forming a very important element in the agricultural population. Last of all on the list come the comparatively lazy and superlatively unthrifty Meos, who own some 350 villages in the two southernmost tahsíls of the district (Nuh and Firozpur). Without the excuse of a barren soil or an excessive revenue, they live so closely up to their income, are so negligent in developing the resources of their land, and indulge so in unwarranted expenditure, that the failure of one harvest plunges them irretrievably into debt. Last year's scarcity found many of them still burdened with debt contracted in the famines of 1860–61 and 1868–69, and has left them with 17 per cent. of their land heavily mortgaged, and much floating debt hanging over them besides.

2. *The number of the family.*—Other things being equal, the lucky man who has few children has less difficulty in making ends meet. When the children are young they make more mouths to feed without any corresponding increase in the number of hands to work, and even when they become old enough to help in the fields, the cost of their food is greater than would be the hire of labourers to give the same amount of work at the most pressing times. Each child too must be married, and marriages are the great extravagance of the agriculturist's family; even where one contracting party exacts a sum of money from the other, the expenses of the ceremony are sure to exceed the income. The greater the number of births, the greater will be the number of deaths in the family, and each funeral too is an expensive affair; the brotherhood and the poor must be luxuriously and extravagantly feasted. There was a time not many years ago when the agriculturist who had a number of sons and daughters to help him to break up new land was likely to better his condition; but now throughout the greater part of the district the population has overtaken the land, and hired labour is cheap. Happy is the man whose quiver is not too full. As might be expected, the unthrifty Meos are famous for the number of their children.

3. *Subdivision of the land.*—This is closely connected with the last head. Where the family is a large one, the family holding is, on the death of the head, sometimes worked in common by the sons, but very frequently divided between them in equal shares. The practice of separating off distinctly the different shares of the land is encouraged by our revenue and law system, and is rapidly becoming more common; and as the increase of a holding by the death of a brother or uncle without heirs is much less common than its subdivision among the sons of the deceased proprietor, this practice leads to the rapid increase of small holdings, the produce of which is barely sufficient to supply the necessaries of life to the agriculturist and his family; and while the heads of families in the village community are gradually becoming more distinct in their individual rights and responsibilities, they have not yet learned to co-operate in the modern sense of the word. There is thus little to fall back on when a season of misfortune comes. The extent of subdivision is generally much influenced by the tenure of the village. Where the village is held in bhayáchára tenure, as is usual among the Játs and Meos, the land is much subdivided, and where the tenure is pattidári, as it often is among the Ahírs, the owners of a share in the village often hold and cultivate it in common, and can thus meet misfortune better than if they had to fight it single-handed.

4. *Facility of irrigation.*—The introduction of the Agra canal into the eastern part of the district has vastly improved the condition of the agriculturists in that tract by increasing the productiveness of their land in much greater proportion than it increases the cost of production, but most of all by protecting them against seasons of drought—the great source of indebtedness and poverty. Although irrigation from the canal commenced only some four years ago, its good effects are already seen, and it is to be hoped that the standard of comfort of the Ját agriculturists benefiting therefrom will be decidedly raised before the population overtakes the increase of produce; provided, however, that their prosperity does not make them lazy, and that the proximity of the canal does not permanently enervate them, as seems to have been the case with the Ját landholders on the Western Jumna canal. There seems some danger of the latter calamity, for this year in particular fever has literally devastated the tract through which the canal passes; some villages have in a few months lost one-sixth of their population, and scarcely a man is to be found who has not been greatly reduced in strength by repeated attacks. But if this proves to have been an exceptional year, as there is some reason to hope, the great diminution of the population may even prove a blessing to the survivors.

The facility of well irrigation is also an important factor, as on this depends the protection of the land from drought; but it must be taken advantage of. The Ahírs work their deep wells, night and day: the Meos often do not take the trouble to sink them when water is near.

5. *Nature of the soil.*—This factor, which at first sight seems most important, really comes low down in the list. The sandy soil of Rewári produces enough to keep the thrifty Ahírs in comfort, while the comparatively rich soil of the Firozpur valley is heavily

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mortgaged to meet the extravagances of the thriftless Meos.

6. *Incidence of the revenue.*—This too is of less importance than would at first sight seem probable. The Ahír landowners of tahsíl Rewári, hitherto notoriously heavily assessed, are much less indebted than the lightly assessed Meos of Firozpur, and less even than the much more lightly assessed Játs of Palwal, thrifty though the latter are said to be.

7. *Status of the agriculturist.*—There is much less difference between the condition of the owner of land, tenant with right of occupacy, and tenant-at-will, throughout the greater part of the district than would be expected. The vast majority of tenants with rights of occupancy, and a very large number of tenants-at-will, have hitherto held their land on condition of paying simply the revenue and cesses due thereon, and they have generally shared on equal terms with the owners in the common rights of the village. However, since the operations of the present settlement began, and more especially since the new assessments were announced last year, the tendency to distinguish more sharply between these classes of agriculturists has been rapidly growing. Tenants-at-will are called on to pay higher rents, or are ejected from land they have held for years on these favourable terms. Suits are instituted to have defined more exactly the rights of occupancy tenants and to enhance their rents. Property in land is becoming more valuable every day, and the rights of owners having been more clearly defined in the new settlement records, money-lenders are willing to advance larger sums than before on the security of land. Thus it is generally remarked that tenants-at-will have greater difficulty in borrowing than owners or even than tenants with occupancy rights. All these tendencies may be expected to develop with remarkable rapidity in the few years following the close of the present settlement operations.

8. *General condition of the people.*—The general condition of the agricultural population then may be said to be painfully dependent on the seasons; all their income comes from the land. Where a landowner, besides the actual produce of his own separate holding, can count among his income the proceeds of hiring his cart between the busy times or those of the sale of his ghi, he finds that in a year of drought even these are apt to fail him, for the difficulty of feeding his oxen and his buffaloes swallows up all the income they bring; and where a cultivator ekes out the produce of his fields by his dues as a village menial or family priest, he finds the villagers in seasons of scarcity unable to pay him the full fee. The Játs of Palwal are now greatly protected against drought, but are in some danger of increasing their expenditure too fast, and losing some of their old industry and thrift; but they may be generally described as well off, especially the landowners. They can easily stand a year of scarcity, and will probably soon recover themselves, though even they are, like all agriculturists, apt to neglect payment of the principal, and even of the interest of a debt once contracted, and often carelessly allow the sum noted against them in the village money-lender's books to grow and grow until they can have little hope of paying it off, the wily banker knowing it to be his interest not to press for ready payment, but to encourage his debtor deeper into the toils, until he has him completely at his mercy. When this is so with men having such advantages as the Játs of Palwal, what must it be with the Meos. Their condition is rapidly becoming hopeless. They live so literally from hand to mouth, carelessly contracting debt for marriages, funerals, and petty luxuries, even in average years, that when a year of drought comes they are thrown on the money-lender, who can make with them what terms he likes. During the past 15 months some 5 per cent. of the cultivated area of the two Meo tahsíls of Nuh and Firozepur has been mortgaged, and now 17 per cent. of the total cultivated area is so burdened that there is little hope of its ever being redeemed. The Meo landowners are rapidly becoming practically reduced into the position of tenants. Their condition loudly calls for special consideration, though it is difficult to see what can be done for them. During the past year a large amount of revenue due from them has been suspended, but they have had to borrow for food and the evil has only been reduced, nor removed. Not a few who had no land to mortgage left the district to seek a means of livelihood elsewhere until better times. It is pleasant to turn from this state of things to that of the Ahírs in Rewári. With all their disadvantages, their industry reduces the evils of a year of drought to a minimum, and their thrift supplies them with a means of tiding over it, and reduces their expenditure for the time. Though the drought of last year was as bad with them as anywhere, they paid their revenue, and that without contracting a larger amount of debt than they are likely to clear off in a year or two of favourable harvest, should they be fortunate enough to have them.

9. *Causes of indebtedness.*—The causes of debt are: (1) general extravagance, which leads to debt even in ordinary years; (2) marriages and funerals, the expenditure on which is enormously disproportionate to the income; (3) drought, which finds the agriculturist without any surplus saved, and kills his cattle and compels him to borrow to pay the revenue and support his family; (4) neglect to pay the interest on debts already contracted, which rapidly multiply themselves.

10. *Estimate of indebtedness.*—Taking the district as a whole I should estimate the extent of indebtedness as follows (but the estimate is worth very little):

Class.	Proportion of class indebted.	Average amount of indebtedness on gross annual income.
Owners - -	Five-eighths -	Two years' gross income.
Tenants with right of occupancy.	Five-eighths -	Two years' gross income.
Tenants-at-will -	One-half -	One year's gross income.

The proportion is abnormally high, owing to the late scarcity.

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limulla.
Rohtak.

Being appointed superintendent of tahsíl Rohtak in 1873, I have had to gain acquaintance with this tahsíl when testing measurement work, and when testing attestation papers of the people who used to come before me. I beg to lay before you the condition, &c. of tenants and owners of certain villages of tahsíl Rohtak with which I am acquainted since 1873.

The ordinary economic condition of the agricultural population engaged in the cultivation of land is, that their sole means of livelihood is the income derived from cultivation of land on which they are engaged. Some of the owners also go into service, and some of the tenants work at trades.

3rd Division.—The reply of this and that of the above para. could not be given satisfactorily in detail in words, so I have given it in tabulated forms, showing all kinds of income and expenditure of agricultural population of the above named villages, whether owners, occupancy tenants, or tenants-at-will. In these forms the condition of people of average circumstances cultivating unirrigated land is given

The following is the difference between a tenant and an owner:—

1. The owners as compared with the tenants can command more credit in every matter connected with their welfare.

2. An owner can sell or mortgage his land in time of need; while a tenant has no power to do so, for tenants falling under section 5 of the Punjab Tenancy Act are only very few in this tahsíl.

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Rohtak.

3. An owner keeps with him all income derived from his land after paying Government revenue and cesses; while a tenant has to pay málikána in addition to land-revenue and cesses.

4. The owners are in good circumstances as compared with the tenants.

5. An occupancy tenant cannot be ejected without any good ground of his neglecting his duties, &c., but a tenant-at-will can be ejected at the expiry of a term of period for which he was entertained. This difference is clear to every one.*

The tenants in this tahsíl are village servants, such as blacksmiths, carpenters, chamárs and potters, who in addition to agriculture pursue their own trades, and their holdings are usually small. Where Játs are tenants, they do nothing besides agriculture. Some of the Ját tenants of Kalánaur are entered as tenants.

The timely fall of rain is the only hope of progress and prosperity in the báráni villages of the tahsíl, on which occasion a cultivator repays his debts of seasons of drought. On the failure of timely rains for two successive harvests he is obliged to have recourse to borrowing, as the surplus of the previous year is never sufficient to support for so long.

No land is kept for grazing the cattle. The shámilát land or land kept for next crop in which spontaneous grass springs up, is used by cattle for grazing. Green mustard is sown mixed with the rabi crops, and cut and mixed with dry joár and bhusa for cattle in some months of the year in the rabi; and green "chari" and grass is cut to feed the cattle in kharíf.

The following are the reasons of the indebtedness of the agriculturist:—

a. When an old member of a Hindu family dies, a ceremony is performed involving an expenditure of Rs. 100 at the least. The average cost is Rs. 500, and in extreme cases it reaches Rs. 1,000.

b. A son's marriage among Hindus. In such cases on an average Rs. 400 are required, to pay to the bride's father; until this sum is paid, the marriage is not allowed to take place.

c. In this tahsíl the holdings of the owners are small; and the owners are never free of dealings with the village bankers. The entire produce of a harvest is consequently usually made over by the owner to his banker. And what the owners need for their food and expenses, and seed and Government revenue, they take in kind and cash from the banker. The banker of course takes care that the produce paid to him is credited at cheap rates, and that what he advances to the agriculturist is charged at dear rates. The accounts are settled up at each harvest; interest due being treated as principal in the next account.

d. The seasons of drought here are very common in every third or fourth year; when it occurs there is little produce or no produce at all; so a cultivator has to borrow for his livelihood, and it often occurs that in such year his cattle die, and he is obliged to ask his trader for a loan to pay revenue and buy bullocks for field. Such are the conditions, and the above are the reasons of the cultivators being in debt, as shown in the illustrative cases appended.

6. There is no custom of batái in this tahsíl; the tenants pay rent in cash.

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* *Note.*—The proprietors themselves cultivate the land here, and among them the "Ját" tribe is the most numerous and most industrious. The next to him are Hindu and Muhammadan Rajputs, who are also cultivators of average degree. The others are miscellaneous tribes of lower respectability and less prosperous.

Mr. Coldstream.

Hoshiárpur.

1. The district to which these replies refer is the district of Hoshiárpur, which lies in the Jullundur Doáb between the Sutlej and the Beas. The northern half consists of hilly country comprising the two outer ranges of the Siwáliks, and the Juswán Dún, which lies between these ranges. The southern half of the district is plain country, generally of great fertility, and covered with mango groves, but intersected by numerous sandy beds of torrents sometimes extending to half a mile in breadth. The Juswán Dún is generally fertile. There are low-lying alluvial tracts on the banks of the Beas and Sutlej which are subject to destructive inundations.

I have been Deputy Commissioner of Hoshiárpur district for nearly three years, and have been over the district repeatedly in every direction.

2. The ordinary economic condition of the agricultural population is not uniform.

The large landowners are well-to-do, and some are even wealthy. These, however, are few in number. The average landowner who cultivates 10 to 15 acres, the occupancy tenants, tenants-at-will, all live from hand to mouth, and the majority are in debt. In the Hoshiárpur Parganah it is calculated that one quarter of the agriculturists have hypothecated or alienated their land; about one-fifth are well off, and have something in reserve; while about one-fifth are free from the pressure of debt, though not able to save.

In this district occupancy tenants are frequently, it would seem, as well or better off than the neighbouring owners. This applies to the plain portions of the district. The owners are often Rájpúts, and from pride of caste or some other reason do not cultivate with their own hands. The occupancy tenants are as a class more industrious cultivators than the owners; in virtue of their inferior social position they have less temptation to extravagance: and they cannot raise money with the same facility as the owners, for their interest in the soil does not form so valuable a security. Further, in the plain parts of the district, the owner's share is so small—8 to 12 per cent.—as not materially to effect his position where he is compared with the occupancy tenant.

At the same time I should mention that in some tracts, for instance about Una, the occupancy tenants are very badly off. Their share of the produce is allotted in kind; and except in very good years the amount they take seems hardly enough to support their families. They take $\frac{55}{100}$ or $\frac{50}{100}$, while the owners get $\frac{45}{100}$ or $\frac{50}{100}$.

The tenant-at-will is uniformly a poor creature living from hand to mouth. He has a little credit, and therefore his debts are not so large as those of the other classes.

It may be asked why, when the value of produce has so much increased, the agricultural community have not generally been able to better their position and to accumulate wealth. The reason is that generally the produce raised on a holding is not much more than sufficient, if it is even sufficient, to support the family of the cultivator. It is only the larger owners who cultivate extensive holdings who have a surplus for sale. And as (in most part of the district probably) the owner's share is a very small proportion of the produce, it is only the very large owners in tracts where the tenants are hereditary as a rule, who make a substantial income out of their proprietary rights.

Proportion of agriculturists who are in debt.—Of those whom I have consulted on these points, tahsíldárs and intelligent landowners, no one has suggested any less proportion of indebted persons than 33 per cent., and only one has put it so low.

In the Dasúya Parganah the tahsíldár estimates the proportion at 75 per cent., while a very intelligent zaildár has put it down at 90 or 95 per cent.

According to the inquiries I have made, it seems probable that about 70 per cent. of the proprietors throughout the district are in debt.

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Mr. Coldstream.

Hoshiárpur.

The same proportion in the case of tenants of both classes is slightly smaller, and may be put down at about 66 per cent.

These results are, I believe, close to the truth.

Causes of indebtedness of agriculturists.—In the case of owners, I believe one great cause of indebtedness is the sudden command of money which the stability of the tenure of land conferred some 20 or 25 years ago, leading to laziness on the one hand and social extravagance on the other.

Social ceremonies, as more money income became available, and the economic use of it had not yet been learned, increased in expensiveness. I believe the next generation or that part of it which still finds itself owner of its ancestral acres (for some land has changed and is changing hands) will have learned a lesson and be more careful.

As regards occupancy tenants, one cause of their indebtedness in the Una Parganah is that their share of the produce is small, and hardly sufficient to serve as a sufficient maintenance.

There are certain other circumstances which embarrass all classes of cultivators, and bring them into debt, or prevent their getting out of it.

1. Increased price of bullocks and other necessaries which the cultivators must buy.
2. The short period of limitation for parole and bond debts. This law enforces too frequent rests in running accounts, and thus gives opportunity for piling up compound interest very rapidly.
3. High rate of interest charged by bankers. There appears to me no remedy for this.
4. Large quantities of land have in this district been yearly destroyed by sand deposited from the hill torrents. Special measures have been suggested to remedy this.

Proportion of average indebtedness to average yearly income.—This is a difficult question to answer. As far as I have been able to judge from opinions recorded, I think the average indebtedness of owners and tenants is a sum equal to three years' income.

The economic condition of agriculturists of all classes is illustrated by the typical instances detailed in the annexed statement, in which actual facts have been recorded.

P.S.—The following additional remarks on the same subject received from Mr. Coldstream, in another communication, will here find a suitable place.

I believe that the majority, *i.e.*, considerably more than half of the agriculturists of this district, are in debt.

I have had occasion to make particular inquiries into the subject in connexion with a proposal for remission of revenue (in 1876-77), in the villages of the Bet, or alluvial land bordering the Beas in the Dasúya Parganah, and took occassion to have statistics compiled with some degree of accuracy.

61 villages or about one-tenth of the Parganah then formed the subject of inquiry; of these villages only two were found to be not indebted. The other 58 villages owed Rs. 2,64,682 to their bankers, or on an average Rs. 4,563 per village; while the average jama is Rs. 466 per village; that is to say, they owed on an average nearly 10 years' jama, or nearly half the average selling price of the (assessed) land of their villages. The details of this enormous mass of debt were as follows:—

—	Secured on Mortgage of Land.	Cash Debts Unsecured.	Total.
Owners - - -	70,964	1,47,596	2,18,560
Tenants with rights of occupancy - -	9,256	36,866	46,122
	80,220	1,84,462	2,64,682

The debts in nine of these 58 villages exceeded 20 years' jama: and in 22 villages the debts equalled or exceeded 10 years' jama.

It is not that the land is highly assessed. In only 22 of them does it exceed Rs. 2 per acre: while the land is good and bears fine crops of wheat and rice.

I formed the opinion that the cause of this state of indebtedness is the relation in which they stand to their bankers on the one hand, and, on the other, the natural improvidence and carelessness of their character, and their extravagant social habits. They are nearly all Ját Rájpúts and Gújar Muhammadans.

Twenty years ago they found out the value of their land, and that they were able to raise large sums on its security. They forthwith proceeded to enjoy the pleasures of a command of cash. They had now the temptation to borrow for a daughter's marriage, and again (*e.g.*, in Sambat 1913) when a bad season came, were driven to a loan. Once into the banker's toils they were not able to escape.

Their apathy and ignorance made them an easy prey to the astute bania, whose accounts they could neither read nor understand.

Afraid to demand an acknowledgment or receipt for any payment, even when they understood the value of such a document, they get credit loans and make payments in kind for a series of years till all recollection of individual transactions has faded from their memories, and then they have to give a bond bearing heavy interest or go into court.

My own opinion is that the next generation would be somewhat better able and willing to take care of themselves: but the question is, will another generation see them the owners of the soil? In many cases it certainly will not. Land has already to some extent changed hands. When the harvest is ready, the bania proceeds to the threshing floor, and the grain is laden on the carts of the Zamíndárs and borne off to the granaries in the town. All is taken except a few months' supply for the needs of the cultivators and their families. This very grain they are forced to take back again at a valuation perhaps 50 per cent. higher than that at which they parted with it.

Thus they go on living from hand to mouth on the edge of starvation, and hardly anticipating the time which appears to be drawing near for many of them, when their proprietary rights will cease to exist even in name.

This state of matters is to be found in a good many villages of Dasúya tahsíl. The description is not applicable to the district generally, but it represents a state of matters not at all uncommon throughout the district.

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r. Hawkins.

Amritsar.

So far as I am aware, there is no material difference in welfare between the three classes of "owners," "occupancy tenants," and "tenants-at-will." This may seem improbable, but it may be explained that good tenants are seldom evicted, and that both classes of tenants practically hold much the same position.

Their economic condition is, I believe, good, if comparison be made with any similar class of peasant proprietors in European countries. One point is, perhaps, specially worthy of notice, that the Zamíndár has since annexation increased his material comforts and possessions considerably, and apparently this progress still continues: it is by no means unusual now to hear of a Zamíndár combining a little money-lending with his agriculture, or able to add to his land by purchase or mortgage. The average dress is better; more ornaments and cattle are kept.

The agricultural population has never much capital, but that this class in the Punjab is not quite without capital is shown by the fact that they have tided over at least three bad years on their own resources, without further help than occasional remissions of revenue.

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Mr. Hawkins.

Amritsar.

The last three years would have gone far to break a good many tenant farmers in England.

As a rule the agriculturist is somewhat in debt, but this appears to be the normal condition of the peasant proprietor in all countries. The money-lender is a power in Ireland, France, or Germany. But as a rule also I should be inclined to think that the agriculturist is solvent, *i.e.*, his estate would pay 20*s.* in the pound. Foreclosure of mortgage is the real ruin of the peasant proprietor, but this is not peculiar to the Punjab ; how many estates in England are clear ?

As to the proportion of debts to income or of insolvents to the whole population, I could give no answer but a guess. The agriculturist will probably over-state his debts in view of future taxes: the money-lender would over-state them for fear they should be afterwards cut down. The indebtedness is certain to be exaggerated. Even in England the local banks only could furnish similar statistics of any value, and the information could hardly be demanded from them.

The debts of the agriculturist are due to various causes: marriage ceremonies will generally be the reply given to a question on the point. Purchase of cattle or advances of seed-grain are, I believe, really the most common cause of debt, and my experience in tracing the origin of book debts and bonds has been somewhat large. It often appears that the original debt, which was merely a small balance due to the general shop of the village, has swollen like a snowball in the course of a generation; a fresh bond for principal and interest being made out every two or three years.

The illustrations given in reply to the third question may give some idea of proportion when collected for the entire province; the figures given below are too few for any generalisation.

The accompanying instances have been taken quite at random with no view of illustrating any particular theory. I trust that they approach correctness, but would remark that the produce of the land is almost impossible to estimate, unless real farming accounts are kept, and is probably under-stated. Also, as noted above, the amount of debt is probably exaggerated; still the value of the property in cattle, and brass vessels, &c. will, in most cases, meet the debt, if the value of the cattle be only taken at Rs. 10 per head.

Muhammad Hayat Khan.

Gurdaspur.

The total number of agriculturists in the district is :—

Tenants-at-will -	- 57,223
Occupancy tenants -	- 23,875
Total tenants -	81,098
Landowners - -	- 385,996
Total -	467,094

And it is estimated that their aggregate debts average :—

	Rs.		
Per owner - - -	2	9	0
Per tenant - - -	1	14	0

These debts are, in every instance, owed to the Hindu bankers and village traders.

Of the total number of agriculturists three-fourths are in debt and one-fourth free of debt, able to pay their revenue from their own funds and selling their grain produce themselves. Prior to the two last bad years more of the people were free of debt.

The usual rate of interest is a very heavy one, two or three per cent. per mensem ; and the frequent balancing of accounts, necessitated by the present law, causes debts to increase very rapidly by compound interest, and drives people to sell their lands. Both lenders and borrowers agree that in former days, there was not so much compound interest charged, and that, no matter how old the account, it was usual to restrict the gross interest charged to 50 per cent. of the principal.

Mr. Tolbort.

Gujránwála.

The bulk of the land of this district is cultivated by the owners themselves. It is estimated that not more than 13 per cent. of the land is cultivated by tenants, whether occupancy or tenants-at-will ; and of the two classes of tenants those at will are more numerous than those having a right of occupancy.

It is estimated that 80 per cent. of the owners, 20 per cent. of the occupancy tenants, and 10 per cent. of the tenants-at-will are indebted.

It is further estimated that the average indebtedness of the owners is about 30 per cent. on their average yearly income; while the average indebtedness of the occupancy tenants, similarly calculated, is estimated at 12 per cent. and that of the tenants-at-will at 5 per cent.

Raí Gopál Dás enumerates 10 causes to which he attributes the greater indebtedness of the owners of land during recent years. The first six of these may be comprised under the general expression "personal extravagance." The seventh is "frequent attendance at court." The eighth "rapid growth of interest and compound interest through the working of the limitation laws." The ninth "rise in price of agricultural cattle." The tenth appears to be a general observation to the effect that owners of land now regard themselves as able to dispose of the fee simple of their estates, which formerly was not the case; and on the other hand the money-lending classes have now become eager to obtain possession of land.

The land owners of this district are not, I think, so indebted as those of many others. In enumerating the causes of agricultural indebtedness I would certainly add "the inequality and want of elasticity of our revenue "system" to those above detailed, and I am inclined to think that the eighth cause in the above list (which reflects on the law of limitation) might be modified so as to designate "inadequate and indiscriminating "judicial investigation, caused partly by over refine-"ment in legislation, undue size of districts, and "over-work of the district staff."

Mirza Azim Beg.

Jhelum.

As regards the economic condition of the agriculturists of these districts there is no very broad distinction between the condition of owners, occupancy tenants, and tenants-at-will. For the first 10 years after annexation the condition of all classes improved greatly; the harvests were nearly always good; cultivation was increasing ; they bought milch cattle and jewels, and fed and clothed themselves much better than they had previously done. By-and-by the crops began to become poorer on the new lands, and some bad seasons occurred. The leases of the first settlements ran out, and the agriculturists were called on to pay revenue on the lands newly cultivated. It also became difficult for them to keep cattle, for they had cultivated their own waste lands and the larger wastes had been formed into Government preserves. So the owners gradually got into debt, and the occupancy tenants. The tenants-at-will, who pay a share of the produce, pilfer a good deal from the crop before it is divided ; and they are commonly village craftsmen

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Mirza Azim Beg.

Jhelum.

adding by their trade earnings to the receipts from their land. The average condition of agriculturists in the three districts of which I am writing may be taken to be as follows:—

Details.		Hazára.	Jhelum.	Gujrat.
Area of holdings in acres	Cultivated	7	11	5
	Grazing land	24	16	5
	Total	31	27	10
Souls per house		5	4	3
Income per annum, Rs.	By articles of food	50	53	40
	Other sources	14	12	20
	Total	64	65	60
		Rs. a. p.	Rs. a. p.	Rs. a. p.
Expenditure per annum, Rs.	Revenue and cesses	7 14 6	10 12 3	8 11 9
	Wages	—	1 8 0	2 0 0
	Purchase of necessaries, not produced on his land	2 0 0	3 0 0	3 0 0
	Total	9 14 6	15 4 3	13 11 9
		Rs.	Rs.	Rs.
Nature of house and value		Kacha, 10 to 50	Kacha, 20 to 70	Kacha, 20 to 60
Rooms	For dwelling	1	1	1
	For cattle	1	2	1
Cattle	Kine	4	4	3
	Sheep and goat	3	3	1
Jewels, value, Rs.		20	35	40
Chattels, ,,		10	15	20
Cash, Rs.		20	—	—

The agriculturists do not usually store grain in their houses; they give it all at harvest time to the village traders. In the northern part of the Hazára district there is a custom by which at every harvest the village banker takes from the agriculturist as interest an odi (four sers) of grain for every rupee owed to him. If an agriculturist cannot pay this interest the cash value of the grain due is reckoned and added to the account. Cases sometimes occur in which, by this custom, all a man's harvest is swallowed up in interest.

In the same way most of the agriculturists of all three districts are in debt; perhaps 25 per cent. are free, not more. Of those in debt about one-third owe as much as one year's income, and this proportion is steadily increasing.

To test the matter I examined the accounts of 23 families in 14 different villages, and found that, whereas they only held land assessed at Rs. 368 per annum, they owed Rs. 3,182, of which Rs. 1,283 was admittedly interest; and of the balance, Rs. 1,899, it is difficult to say how much is really principal and how much old interest; but so far as I can ascertain only one-third of this, Rs. 1,899, is principal, and the rest is all accumulated interest. The men who owe this possess jewels, value Rs. 972, and goods and chattels, value Rs. 334, and their land besides.

Examining nine other villages I found that of 347 agricultural holdings 164 were free of debt; 97 owe sums not exceeding 10 times their annual assessment; 65 owe more than that, but less than 30 times the annual assessment; and 21 more than 30 times the annual assessment. The total annual assessment of these nine villages is Rs. 4,226, and their total debts are Rs. 32,454. The real reason of these debts is originally the extravagance of the Zamíndárs, and subsequently heavy charges of interest. The accounts are opened with items of all descriptions, from payments of revenue to common expenses; but the real reason of the debts is as above stated.

In Jhelum it is the custom to charge two annas in the rupee for lending money, thus where a bond is given for Rs. 100 the debtor has only received Rs. 87 8; and then he is charged on the said Rs. 100 interest at two annas per rupee (12½ per cent.) per harvest, the unpaid interest being added at each harvest to the principal. At this rate in three years' time the debtor's account shows Rs. 227 13 0 due, though the sum actually borrowed was only Rs. 87 8 0. Thus he has been charged Rs. 140 5 0 interest. If the debt runs on in the same way for three years more its total will then stand at Rs. 460 11 0.

The old custom was not to balance the account every harvest, but only when the Zamíndár wished to settle it or other special occasion arose; and for the oldest account not more than 50 per cent. was charged as interest if cash was paid, or 100 per cent. if settled by paying in grain or cattle.

Moreover, both debtors and creditors are equally careless; the debtor in borrowing and the creditor in lending. A cultivator with a small holding used not to be able to borrow more than Rs. 20; now he can borrow Rs. 100 or 200; or rather the sum he originally borrowed was small, and the debt has increased by interest. The creditor bides his time, and when he sees the debtor can pay will press him in our courts. Another reason is this: the land will sell for a large sum; for instance, in the case of the 23 families owing Rs. 3,182 above mentioned, they own 327 acres of land, which if sold would, at the rates now obtainable for land, Rs. 84 per acre, fetch Rs. 27,599. In former days land could not be sold at all; but it should be remembered that if much land were offered for sale such high prices would soon fail.

Mr. O'Brien.

Muzaffargarh.

Occupancy and non-occupancy tenants. — No material difference in welfare exists between tenants with occupancy rights and tenants-at-will in this district.

Average area owned and cultivated.—The average area owned by proprietors is five acres. The average area cultivated by tenants is 13 acres. Both proprietors and tenants have an area for grazing, which is practically unlimited.

Proportion of owners in debt. Ratio of debts to yearly income.—Both proprietors and tenants live in what is literally a hand-to-mouth way. Each harvest

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Mr. O'Bri

Muzaffargar

barely suffices for the wants of the half year, and is almost always forestalled by borrowing. In regard to their economic state and habits, the agricultural classes naturally group themselves into Muhammadans and Hindus; the Muhammadans being five times the number of the Hindus. Of the Muhammadan proprietors 70 per cent. are in debt. Of the Hindu proprietors 30 per cent. are in debt. It is very difficult to estimate what proportion the average indebtedness of the proprietors bears to the average yearly income. The lowest estimate in the materials before me says that the amount borrowed yearly is equal to 30 per cent. of the yearly income of the indebted proprietors. The highest estimate gives the debts as 80 per cent. of the yearly income.

Proportion of Tenants in debt, and ratio of debts to yearly income.—Of Muhammadan tenants 40 per cent. and of Hindu tenants 20 per cent. are in debt. The yearly debts of the tenants are equal to 20 per cent. of their yearly income.

Cause of the difference between the indebtedness of Hindus and Muhammadans.—The cause of the difference between the numbers of the indebted among Muhammadans and Hindus respectively is to be found in the difference of the habits of each class. Muhammadans are mostly spendthrift and improvident. The Hindus are the reverse. Muhammadans are nearly always uneducated; Hindus are always more or less educated. Hindus usually avoid acts that would bring them within the reach of the criminal law, while Muhammadans supply almost the whole criminal population, and so incur the expenses which follow from being suspected by the police and being prosecuted. Muhammadans have only one source of income, viz., agriculture. Hindus who own and cultivate land almost always combine money-lending and trade with agriculture. Hindus acquire land as payment for debts, Muhammadans generally borrow money to buy land.

Causes of indebtedness.—The causes of indebtedness are common to owners and tenants, and may be divided into two classes:—

Physical causes arising from the special natural features of the district.

The action of the agriculturists.

Physical causes.—The rain-fall is so small that no crop will ripen from rain alone. Agriculture depends on the rising of the rivers and the inundation canals assisted by wells; excessive floods as well as failure in the regular rising of the river are ruinous to the agriculturist. Insufficient or irregular supply of water in the canals is a fruitful source of debt. The canals of this district have been very much neglected since British rule. In one tahsíl the indebtedness is distinctly to be traced to this cause. Most of the debts date from 1869 and the subsequent years. From 1869 to 1875 the canals were not properly cleared, and consequently did not fill in the proper season, ran irregularly, and stoped flowing early.

Habits of the People. Bad farming.—But the chief cause of the indebtedness lies in the habits of the people. They are very careless and lazy farmers; I do not suppose that the farming is very good anywhere in the Punjab, but the bad farming in this district at once attracts the notice of the native officials who come from the eastern and northern parts of the Punjab, and is a constant subject of remarks.

The agriculturists are wasteful in harvesting the crops and in preparing their indigo and sugar, and are careless in disposing of their produce, especially in not looking out for the best prices and in not retaining a stock for food and seed.

It is an almost universal institution that shopkeepers should take the whole of the Government share of the crop and pay the cash revenue for the agriculturist. The Government share fixed by custom is one-third or one-fourth of the crop, and often is as high as one-half. The cash revenue is equal to about one-eighth. The large profits made by the shopkeeper on a transaction of this kind are evident.

They neglect their bullocks, do not clothe them in winter and under-feed them; when a bullock comes from work, an armful of uncut and unwashed turnips is thrown before him. The bullock's teeth and lips grasp the round turnips with difficulty. It takes a long time for him to get a meal, and when it is eaten he has taken in a quantity of earth which was clinging to the turnips. The consequence is that the bullocks are very soon worn out, and as the district does not breed its own bullocks they have to be imported at a great cost.

Extravagance.—The agriculturists are very extravagant. They spend sums beyond their means at marriages, betrothals, circumcisions, and funerals. They pay constant visits to shrines and places of pilgrimages, and make offerings there which they can not afford. This part of the Punjab is overrun by religious impostors of different kinds, and the agriculturists make them presents out of all proportion to their incomes, and vie with one another in the largeness of their gifts.

Persons who cannot afford to do so keep saddle horses. Large sums are spent on women, lawfully and unlawfully.

Debt the cause of debt.—One great cause of debt is debt. The crops have generally been forestalled. When they are harvested, the creditors carry off the whole, and the agriculturist has to begin again borrowing for his daily wants, and he borrows under very disadvantageous circumstances. In the Alipur tahsíl, when cash is borrowed, 2½ annas is deducted as interest and chilkána, and after a year a balance is one-half is added to the balance. Thus if a person struck and borrows Rs. 20, the loan is entered as Rs. 23 2 0, and if nothing is paid during the year, Rs. 11 9 0 is added to it, and the debt is brought forward into next year accounts as Rs. 34 11 0.

There is a ruinous practice called bhanauti in practice, which can best be described by an instance which came to my knowledge this year. A. borrowed money in December—January to pay the kharíf instalment of land revenue, promising to repay the loan in June—July in grain at the rate of a path * of wheat for every Rs. 32 borrowed.

The usual price of a "path" of wheat in June—July is Rs. 55. In the year in question the market price was Rs. 85. I have known instances of rich agriculturists who had money in their houses forestalling the wheat crop by bhanauti in order to pay the kharíf instalment of land revenue, rather than pay money out of their houses because they thought it unlucky.

Improvidence.—It is not bad farming or extravagance alone so much as improvidence that makes the agriculturists indebted. It is contrary to their habits to keep ready money by them. If a man makes a few hundred rupees more than his expenses, he will not keep any part of it for a bad year. He at once buys more land or more bullocks, or ornaments, or a wife. He will do anything rather than keep the cash. If then there is a bad harvest next year, he must go to the money-lender. No agriculturist ever has a balance to the good with his banker. Every one works with a balance to the bad and trusts to the harvest to put him right. The money-lending class is well able to take advantage of the extravagance and improvidence of the cultivating class. There is a local proverb in use among the former on the wisdom of keeping the latter in debt, *i.e.,*—*Jat té phat badha changé,*—"An agriculturist, like a wound, is better when bound."

Cause of the bad farming, extravagance, and improvidence.—There can be no doubt that the continued bad farming, extravagance, and improvidence of the agricultural classes has produced the present state of indebtedness. But if we go further and ask what caused the bad farming, extravagance, and improvidence, the answer is that the people were never trained for the position in which they were placed by our Government, and were never fit for such a position.

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* A measure of grain equal in weight to about 32 maunds.

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PUNJAB.

r. O'Brien.

uzaffargarh.

Under former Governments they were kept as regards agriculture in a state of tutelage. They were quite unaccustomed to manage for themselves. The Government kardárs did every thing for them, made them cultivate the land, made the Hindus lend them money and seed, and made the borrowers repay. The agriculturists were pitted against one another to cultivate. If one man did not cultivate his land, it was taken from him and given to another who would cultivate. After annexation this minute superintendence was withdrawn. The agriculturists were introduced for the first time to the name and responsibilities of proprietorship, and a system was introduced which enjoined the exact contrary. "Don't interfere "with the distribution of the assessment or the "internal management of the villages; the people do "this much better themselves," was the order. The agriculturists who had for generations been accustomed to have every part of their economic details done for them by Government officials were as helpless as a child, which can' hardly walk when deprived of the chair on which it leaned, and the money-lender stepped into the place which the former Governments occupied. This I believe to be the true origin of the indebtedness in this district, and the neglect of the canals did the rest.

The indebtedness in this district is greater than in any district with which I am acquainted. I beg to append some very true remarks of Mr. Lyall's on the subject, which he made when reviewing the assessment report of the Alipur tahsíl.

I have the honour to forward a statement in the prescribed form showing the actual economic facts regarding fifteen individuals of the agricultural class selected from different villages in each of the three tahsíls. The items of expenditure are, I think, very correct, for they were first ascertained from the individual himself, and then checked by the shopkeeper who received his crop when grown, supplied him with necessaries, and lent him money. The income is, I am afraid, understated.

J.B.Lyall.

Extract from report by MR. J. B. LYALL, Settlement Commissioner, December, 1877.

Sale and Mortgages; character of the Landholders.—There is nothing alarming, in my opinion, in the return of land sold and mortgaged since 1861. The price per acre looks very low in Bet Indus and Cháhi Sailáb, but the proportion of waste sold in these circles is large, which may account for part of the difference. There is, however, no doubt that the value of land in these circles is exceptionally low, and the table of average price per rupee of Government demand for land sold in 1873–76 proves the fact. It will be observed notwithstanding that the tahsíl as a whole compares favourably with Sánnáwán in respect to selling price of land. I quite agree with Mr. O'Brien's remarks as to the indebtedness of the agriculturists and the faults in their character which are its main cause. The same faults are attributed generally to the Muhammadan landholders of all this southern corner of the Punjab, but they are found in this tahsíl in a very exaggerated form. The heavy floods and the fever which follows have something to do with it. The almost universal prosperity of the Kirár landholders is proof that there is nothing crushing in the general pitch of the assessment. But as the Biloches, Syads, and Ját say, it would be folly to expect them to alter their characters and habits and rival the thrift and frugality of the Kirárs. These Kirárs are the Jews of the country, and have a special natural aptitude for earning and saving money. The general character of the agriculturists must be considered in assessing, but from what I have seen here and in Multan and Dera Gházi Khan I do not believe that a very light assessment would tend to get them out of debt.

Thorburn.

Bannu.

I answer question about economic condition of the peasant by enclosing a copy of the paragraph on the subject written some time ago for the final report. I may add that some of my superintendents think I have represented the condition of the ordinary peasant proprietor too favourably. They think there is greater real indebtedness.

I send the statement filled in as required.

Extract from Final Report on the Bannu Settlement.

General condition of the Cultivating and Landlord Classes.—The large majority of the landowning classes are self-cultivating peasants of small means and frugal habits. With two important exceptions they are all fairly prosperous, and in infinitely easier circumstances than they were 30 years ago. Taking a family to consist of a man, his wife and two young children, the annual cost of living to an ordinary peasant proprietor ranges from Rs. 70 in Marwat to Rs. 110 in Bannu proper. It is lower amongst the Marwats than elsewhere, because their extreme poverty, and the fewness of home-produced consumable articles enforce great simplicity in diet, and a close economy in every other branch of domestic expenditure, especially clothing. It is highest amongst the Bannuchis, because every man's holding produces a large variety of consumable articles, and the exhausting nature of the climate requires them to live well. The Bannuchi frequently indulges in meat and ghí; the Marwat seldom sees either, except at great festivals or rejoicings on the two Eid days and at a marriage. Every peasant has a running account with his bania and borrows money as a matter of course to defray marriage or burial expenses and at times to pay his revenue. When he has sold or eaten the last of his own reserved store of grain—a frequent occurrence, about a month before the next crop is ripe, or when that crop fails, he borrows food grain from the bania and returns up to double after harvest. Still in canal-irrigated parts, or sailába lands, and elsewhere in fair average years, there is no general real indebtedness, and from Rs. 20 to Rs. 50 will represent the average amount to a man's debit two or three months after the harvest has been ingathered and the revenue paid. Most peasants live up to their means, and except in the shape of bangles never have any capital in hand. When a man has a good balance, he either redeems a mortgage or invests it in land, or buries it. Money saved in this latter way is generally referred to as treasure (khazána); savings are hardly ever invested in cattle. So far I have spoken of the ordinary peasant; but with two exceptions. They are the Marwats of the poor sandy tracts, the larger half of Marwat, and those of the Bannuchis, whose holdings are so minute as to give the owners a bare subsistence. With both the struggle for existence is terrible, when anything occurs to increase expenditure or reduce income, and numbers drop down every unfavourable year into the position of tenants or of labourers. With the former, once a debt of the class known as gharah (neck) is incurred, it is pretty certain that in a few years the debtor must sell his land. This pernicious gharah system of securing a loan dates from some 20 years back. Under it the debtor either engages to pay as interest a certain portion of his earnings, and thus makes himself the quasi-bondsman of his creditor, or a certain measure of grain each harvest, crop or no crop. The usual rate is a topah of grain, *i.e.*, about five sers per rupee lent, hence this species of debt is known as topah in pái. The sum of gharah debts in Marwat was in 1875 considerably over half a lakh of rupees, but now I believe it is less. The indebtedness of a large proportion of the Marwats is due I think chiefly to over-assessment and the rigidity of our revenue system, but there is also no doubt that without any assessment at all in bad

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Mr. Thorburn,

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years or cycles, debts would be incurred, and some old peasant proprietors would have to sell or mortgage their holdings. In this settlement the over-assessed villages have received substantial reduction, but Government still owes them reparation for the great injury of having for the 22 preceding years rack-rented them, so to say; and as the rigid revenue system remains, the district officer is under an obligation to work the rules sanctioned for suspensions and remissions with a wise liberality. In the other exceptional case, that of the owners of the minutest of the minute Bannuchi holdings, Government neither can nor ought to do anything. The assessment is fair, and a crop being a certainty, our system is elastic enough. The cause of the smallness of the holding is over-population, and for that the State is not called upon to find a remedy. Besides the Bannuchis are such a poor hybrid race as to be of little political account. With them there is no fear of a stalwart hereditary peasantry being expropriated, as there is in Marwat.

As to the tenant and labouring classes throughout the district, they are probably as well off as their fellows in any part of the Punjab. Able-bodied men can always get employment at a fair remuneration, and cultivators are still in demand for the Hár tracts, but the supply is deficient except in drought cycles.

Now to pass on to the landlord class, the sufaid poshes who do not cultivate with their own hands. As a rule they are neither so frugal nor prosperous as the peasant proprietary class; good 20 per cent. of them are deeply involved in debt; and a large minority habitually live beyond their income. A few, of course, say 10 per cent., are shrewd careful men, and their holdings and incomes are growing, not diminishing, in amount. Families sink into poverty from two causes, both due to a foolish pride.

The head of the house thinks he must maintain a reputation for hospitality, the highest of virtues amongst Pathans, and to maintain it he mortgages and borrows freely. Then his sons, they are brought up in idleness and married early; and no matter how the *res angusta domi* may press, they disdain to work with their own hands.

The following statement has been compiled from particulars furnished by district officers, whose replies to Question 9 are given above, regarding the circumstances of individual agriculturists, whose cases have been selected as types.

The different results arrived at in the several districts may be seen at a glance; and will suggest the impossibility of forming any accurate conception of the true economic condition of the landed classes by a mere arithmetical process of this kind, as long as agricultural knowledge remains as defective as it now is, among both the district officers and the agriculturists themselves:—

ECONOMIC CONDITION of the AGRICULTURAL POPULATION.

—	Delhi District.	Gurgaon District.	Rohtak District.	Hoshiárpur District.	Amritsár District.	Jhelum District.	Muzaffargarh District.	Bannu District.
1. Number of holdings inquired into - -	19	24	53	15	6	6	11	3
2. Average number of persons in family -	8·5	6·458	9·415	6·8	10·3̇	4·16̇	6·545	7·6̇
3. „ „ cultivated acres per holding.	11·5	18·583	29·433	14·974	19	8·182	18·	15·75
4. „ out-turn of food grain (in maunds) per holding.	Maunds. 85·247	Maunds. 133·673	Maunds. 173·146	Maunds. 96·035	Maunds. 128·362	Maunds. 18·979	Maunds. 108·147	Maunds. 93·5
5. „ consumption of food-grain and seed per holding.	67·115	51·205	92·483	60·927	109·745	23·77	57·646	60·916
6. „ amount of surplus food per holding	18·132	82·468	80·663	35·108	18·617	−4·791	50·501	32·584
7. „ value of „ „ „	Rs. 27·3	Rs. 87·32	Rs. 75·421	Rs. †121·027	Rs. 25·743	Rs. 5·427	Rs. 57·353	Rs. 34·854
8. „ *net* value of *non*-food grains produced per holding.	32·043	18·958	7·654		55·916	—	102·151	18·3
9. „ amount of other miscellaneous sources of income per holding.	54·954	30·385	*52·158	10·608	12·16̇	44·16̇	19·614	14·
10. „ total cash income over and above consumption per holding.	114·297	136·663	*135·233 or, deducting pay&pensions, 118·743	131·635	93·825	38·739	179·118	67·187
OUTGOINGS.								
11. Average revenue, rent, and cesses per holding	33·718	31·492	26·383	37·788	27·513	15·	44·511	25·75
12. „ payments for hired labour and village menials per holding.	24·105	15·208	9·711	20·813	30·145	—	89·832	9·16̇
13. „ expenditure on *non*-home grown necessaries per holding.	27·221	23·74	22·775	20·8	16·5	7·458	64·416	33·16̇
14. „ total outgoings - - -	85·044	70·44	58·869	79·401	74·158	21·458	198·759	68·083̇
15. „ surplus or deficit of income over outgoings.	+29·253	+66·223	+76·364 or, deducting pay&pensions, +59·874	+52·234	+19·667	+16·281	−19·641	—·896
16. „ number of cattle per holding—								
Oxen - - - -	2·263	1·5	2·547	3·93̇	3·3̇	2·	5·727	3·3̇
Cows - - - -	2·578	1·	1·377	1·06̇	2·16	16̇	3·636	3·6̇
Other animals - - -	3·052	2·25	3·	2·8	4·83	1·16	3·818	2·3̇
Total - - -	7·893	4·75	6·924	7·79̇	10·32	3·332	13·181	9·32
17 „ possessions, value—	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
grain - - - -	35·216	6·27	5·187	2·	13·83̇	—	8·434	1·
ornaments and clothes - -	58·092	27·395	51·669	101·13̇	23·3̇	48·3̇	27·952	30·
chattels - - - -	36·213	16·442	36·306	28·	30·52	20·	23·818	31·16̇
Total - - - -	129·521	50·107	93·162	131·13̇	67·686̇	68·3̇	60·204	63·16̇
18. Number of persons indebted - - -	13	16	27	12	5	6	9	3
19. Average amount of debt - - Rs.	238·889	203	182·925	247·083	174·4	100·489	632·908	87·6̇

* Eight persons receive pay or pension, aggregating Rs. 874, deducting which the miscellaneous income of the district averages 35·668.

† Not given separately.

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NORTH-VESTERN 'ROVINCES ND OUDH.

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NORTH-WESTERN PROVINCES AND OUDH.

Example 1.—Dewan Singh, Ját, occupancy tenant of Penna, pargana Baghra, 21st August 1878.

1. Thirty-one bighas pakka is the area of the holding and the whole is cultivated, none left, for grazing purposes. Cattle, graze on the shamilát land which amounts to 881 bighas pakka, and is fallow.

2. The family consists of the man's father - 1

Himself and two brothers -	3
Mother -	1
Wife -	1
Sons -	2
Daughters -	2
	11

3. Food grain produced as follows :—

Designation of Crop.	Area in Pakka Bighas and Biswas.	Yield per Bigha, Pakka.	Total yield.	Rate per Rupee.	Total Value.
Kharif.		M. s. c.	M. s.	M. s. c.	Rs. a. p.
Indian corn -	2	4 20 0	9 0	0 30 0	12 0 0
Urd -	2	3 0 0	6 0	0 25 0	9 9 9
Juár -	Sown with urd	1 20 0	3 0	1 0 0	3 0 0
Juár, urd and til -	3	Juár. 1 35 0	5 25	1 0 0	5 10 0
		Moth. 1 35 0	5 25	1 0 0	5 10 0
		Til. 1 0 0	3 0	0 13 4	9 0 0
Total -	—	—	—	—	44 13 9
Chari -	3	18 30 0	56 10	3 0 0	18 0 0
Kawar -	1	4 20 0	4 20	0 30 0	6 0 0
Bhúsa of kawar -	—	4 20 0	4 20	4 20 0	1 0 0
Do. wheat and barley -	—	—	114 0	5 0 0	27 12 10
Do. gram -	—	—	9 0	3 0 0	3 0 0
Total -	—	—	—	—	55 12 10
Rabi.					
Wheat -	10	4 20 0	45 0	0 25 0	72 0 0
Gram -	2	4 20 0	9 0	0 30 0	12 0 0
Barley -	2	6 0 0	12 0	1 0 0	12 0 0
Masúr -	Sown with barley	6 0 0	12 0	1 0 0	12 0 0
Mustard -	Ditto wheat	—	1 0	0 13 4	3 0 0
Safflower -	Ditto gram	—	0 10	0 20 0	0 8 0
Total -	—	—	—	—	111 8 0

4. Other crops :—

Designation of Crop,	Area in Pakka, Bighas, and Biswas.	Yield per Bigha, Pakka.	Total yield.	Rate per Rupee.	Total Value.
		M. s. c.	M. s.	M. s. c.	Rs. a. p.
Cotton -	2	2 10 0	4 20	0 10 0	18 0 0
Sugarcane -	3	0 13 10	39 30	3 8 0	139 6 0
Safflower -	—	—	0 3	0 3 0	1 0 0
Total -	—	—	—	—	158 6 0

5. Rent payable amounts to Rs. 64 per annum, bilmukta or a lump sum.

6. Cost of labour :—

Designation of Workman.	No.	Grain or Saccharine produce allowed.	How cultivated.	Total Grain or Sweetmeat allowed.	Rate.	Value.
						Rs. a. p.
Ploughman -	1	⅛th share after deduction of charges of workman.		—	—	18 4 6
Carpenter -	—	—	—	1 0 0	1 0	1 0 0
		Sweetmeat 0 1 8	Per rotation for 8 rotations.	0 12 0	3 8	1 0 9
Blacksmith -	—	Grain	—	1 0 0	1 0	1 0 0
		Sweetmeat 0 0 12	Ditto -	0 6 0	3 8	0 8 4
Potter -	—	Grain	—	0 20 0	1 0	0 8 0
		Sweetmeat	—	0 3 0	3 8	0 4 0
Peria -	—	20 10 0	Ditto -	2 0 0	—	7 0 0
Jhoka -	—	0 1 8	—	0 12 0	—	1 0 9
Workman -	—	0 5 0	Ditto -	1 0 0	—	3 8 0
Muthia -	—	0 1 0	Ditto -	0 8 0	—	0 11 2
Rent of sugar mill -	—	—	—	—	—	8 0 0
Do. of boiling pan -	—	—	—	—	—	2 8 0
Wood -	—	—	—	—	—	3 0 0
Oil -	—	—	—	—	—	2 0 0
Reaping rabi crops -	20	—	0 5 0	2 20 0	0 25	4 0 0
Digging and weeding sugar-cane -	—	—	—	—	—	10 0 0
Total -	—	—	—		—	56 13 6

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Pundit Rac hakishen.

Muzaffarnag

7. Other charges :—

	Rs.	a.	p.
Iron	3	0	0
Hackery	2	0	0
Water bucket	5	0	0
Bullocks	15	0	0
Salt and spices	2	0	0
Cloth	5	0	0
Utensils	0	8	0
Shoes	4	0	0
Khal, &c.	10	0	0
Total	46	8	0

8. Dwelling-houses :—

There are three kucha houses; of these one is for cattle and consists of one kotha and one chappar; of two others one occupied by himself has one kotha, one chappar.

Other dwelling-houses occupied by other brothers, one sidari, one kotha.

9. Cattle—

Bullocks	5
Foal	1
Buffaloes	2
Young ones	2
Cows	2
Calves	2
Mare	1
Total	15

10. Other property utensils are—

Parat	1
Thâli	4
Degchi	1
Tokni	2
Lota	3
Katora	3
Chamcha	1
Tawa	2
Glass	2
Karhai	1
Total	20

One-eighth of a grove is 17 bighas 8 biswas.

11. Sufficient grain retained for one or two months' use, the rest is made over to the village banker.

12. There has been no surplus for the last six or seven years; prior to that, whatever was saved was used in marriage expenses.

13. Has been in debt for last seven or eight years, the total debt now amounting to Rs. 400; of this Rs. 250 were contracted in last and the present year. For Rs. 150 jewels are pledged at Re. 1-8 per cent. per mensem, interest for the remainder two per cent. is charged. Originally the debt amounted to Rs. 45; this sum was borrowed for purchase of a cow, &c. Rs. 35; other petty charges, Rs. 10.

Dealings have continued ever since then, and at the present time the debt amounts to Rs. 400.

In this village there are 164 cultivators; of these only one (Daulat) is not in debt, all the others are involved more or less.

	Rs.	a.	p.	Rs.	a.	p.
Total income	370	8	7			
Deduct value of fodder	55	12	10			
				314	11	9
Expenditure				167	5	6
Total				147	6	3
	Rs.					
Add sale of ghi	20					
Mukaddami allowance	20			40	0	0
				187	6	2

Example 6.—Jawahir Singh, Rawa, of Satheri, occupancy cultivator, 22nd August, 1878.

1. Cultivates 40 bighas pakka. No land set apart for grazing; cattle graze on road and field boundaries or fed on chari and bhûsa.

2. The family consists of himself, wife, son and daughter, son's wife; total 5.

3. Food-grain produced as follows :—

Description of Crop.	Area in Paka Bighas and Biswas.	Field per Bigha. Pakka.	Total Yield.	Rate per Rupee.	Total Value.
Kharif.		M. s.	M. s.	M s.	Rs. a. p.
Indian-corn	1	6 0	6 0	0 30	8 0 0
Rice	1	3 30	3 30	0 30	5 0 0
Mungi	1	4 20	4 20	0 25	7 3 0
Urd	3	3 0	9 0	0 25	14 6 6
Til		—	0 6	0 13	0 7 6
Mung	1	2 10	2 10	0 20	4 8 0
					39 9 0
Chari	5	18 30	63 30	5 0	18 12 0
Kawara	4	3 30	15 0	0 35	17 2 3
Bhusa of urd	—	4 20	13 20	3 0	4 8 0
Rabi.					40 6 3
Wheat	12	5 10	63 0	0 25	100 13 3
Gram	4	6 0	24 0	0 30	32 0 0
Barley	2	7 20	15 0	1 0	15 0 0
Mustard	Sown with wheat	0 30	0 36	0 13	2 13 9
					150 11 0
Bhusa of wheat	—	—	156 0	5 0	31 3 0
Do. gram	—	—	24 0	3 20	6 14 6
4. Other Produce—					188 12 6
Sugar cane	14 10	10 20	47 10	3 p.md.	141 0 0
Cotton	1 0	1 35	1 35	0 10	7 8 0
					149 4 0

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5. Rent payable amounts Rs. 106, water-rate Rs. 30=Rs. 136.
6. Charges for labour.

Designation of Workmen.	Number.	Grain or Saccharine Produce Allowed.	How Calculated.	Total Grain or Saccharine produce allowed.	Rate per Rupee.	Value.
		M. s.	Rs.	M. s.	M. s.	Rs. a. p.
Ploughmen - - - -	2	—	2-4-0 per mensem	—	—	54 0 0
Cowherd - - - -	1	Grain	—	6 0	0 30	8 0 0
Carpenters and blacksmiths -	2	Grain	1 md. 5 seers, each	2 10	0 30	3 0 0
		Rab	10 rotations at 3 seers each	0 30	0 13	2 4 0
Potter - - - -	—	Grain	—	1 5	0 30	1 8 0
		Rab	For 10 rotations, 8 chtks. each	0 5	0 13	0 6 0
						69 2 0
Peria - - -	2	—	Per rotation, 8 seers for 10 rotations	2 0	do.	6 0 0
Jhoka - - - -	2	—	Do. at 4 seers per do.	1 0	0 13	3 0 0
Boiler - - - -	1	—	„ „ 3½ „ „	0 35	3 0	2 10 0
Muthia - - - -	1	—	„ „ 2 „ „	0 20	—	1 8 0
Hire of karhai - - -	—	—	—	—	—	1 4 0
Wood - - - -	—	—	—	—	—	2 8 0
Oil, 7½ seers - - -	—	—	—	—	—	1 12 0
Weeding cotton, sugar-cane, rice, Indian-corn, &c.	—	—	—	—	—	10 0 0
Reaping rabi crop - -	50	—	5 seers each	6 10	—	8 5 2
						196 1 3

7. Other charges:—

	Rs.
Iron - - - -	3
Hackery - - - -	1
Wheels for do. - - -	2
Bullocks - - - -	5
Salt and spices - - -	2
Cloth - - - -	5
Utensils - - - -	1
Shoes - - - -	2
	21

8 Dwelling-house:—There are two kucha houses, of these one is occupied as dwelling-house; it has four dokuria; and the other is an inclosure for cattle, containing five chappars, but of this the man only owns ¼th share. The dwelling-house is entirely his own property.

9. Detail of cattle:—

Bullocks - - - -	4
Cow - - - -	1
Buffalo - - - -	1
Calves - - - -	2
Mare - - - -	1
	9

10. Other property; vessels:—

Thali - - - -	3
Katora - - - -	3
Katori - - - -	1
Tokni. - - - -	1
Parat - - - -	1
Lota - - - -	3
Degchi - - - -	1
Chumcha - - - -	1
Glass - - - -	2
Karhai - - - -	1
Tawa - - - -	1
Hukka - - - -	2

Besides half of a grove in 2 bighas 14 biswas. Jewels worth Rs. 150.

11. Grain:—About 25 maunds are retained every year for food. For further requirements the baniya is applied to.

12. Surplus:—There has been no surplus from the last 10 years; when there was any it was spent in marriages or ornaments; never lent out or hoarded at home.

13. The debt is of many years standing, the man's father having commenced it. Some three years ago the debt was paid off by selling surplus produce, jewels, and other goods for Rs. 900; since then it has again risen to Rs. 200; of this Rs. 100 were originally borrowed for purchase of a sugar-mill, interest and further loans have now brought it up to Rs. 200.

In this village there are 110 cultivators; only seven are free from debt.

	Rs. a. p.	Rs. a. p.
Total income - -	417 15 9	
Deduct value of fodder -	78 7 9	
		330 8 0
Expenses - - - -		263 1 3
Profit - - - - - -		76 6 9
Add modkuddami allowance - -		27 8 0
		103 14 9

Example 7.—Sriram, Brahman, occupancy tenant of Rámpur, pargana Muzaffarnagar, 11th September, 1878.

1. The holding comprises 52 bighas and two biswas pucka; of this 3 bighas are left fallow for grazing purposes, and 49 bighas 2 biswas brought under cultivation.

2. The family consists of himself and his

brothers - - - - - - -	2
Brother's wife - - - - - -	1
Sons - - - - - - -	2
Sons' wives - - - - - -	3
Son's daughter - - - - - -	1
Total	9

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3. Food grain produced :—

Description of Crops.	Area in Pucka Bíghas and Biswas.	Yield per Bígha Pucka.	Total Yield.	Rate per Rupee.	Value.
Kharif.		M. s.	M. s.	M. s.	Rs. a. p.
Urd - - - - -	5	1 35	9 15	0 30	12 8 0
Shamakh - - - - -	Sown with urd	1 20	7 20	1 0	7 8 0
Moth, mung - - - -	7	1 20	10 20	0 30	14 0 0
Bájra - - - - -	7	1 20	10 20	0 30	14 0 0
Monji - - - -	5	3 30	18 30	0 25	30 0 0
Total - -	—	—	—	—	78 0 0
Chari - - - - -	4	18 30	75 0	5 0	15 0 0
Kawara - - - -	1	3 0	3 0	1 0	3 0 0
Bhusa of urd - - -	—	—	20 0	4 0	5 0 0
Do. gram - - - -	—	—	18 0	4 0	4 8 0
Do. wheat and barley - - -	—	—	124 0	5 0	24 12 9
Total - -	—	—	—	—	52 4 9
Rabi.					
Wheat - - - - -	15	4 20	67 20	0 25	108 0 0
Barley - - - -	3	5 0	15 0	1 0	15 0 0
Gram - - - - -	4	4 20	18 0	0 30	24 0 0
Masur - - - - -	7	1 20	1 20	0 25	2 6 4
Total - -	—	—	—	—	149 6 4
4. Other than food grain.					
Cotton - - - - -	1	1 35	1 35	0 10	7 8 0
Sugarcane - - - - -	3	15 0	45 0	3 per md.	135 0 0
Total - -	—	—	—	—	142 8 0

5. Rent payable Rs. 112–14–9; water rate Rs. 60; total Rs. 172–14–9.

6. Charges of labour are :—

Designation of Workman.	Number.	Grain or Saccharine allowed.	How Calculated.	Total Grain or Saccharine allowed.	Rate.	Value.
				M. s.		R. a. p.
Ploughman - - -	2	Grain	⅛th of 148 mds yield -	18 20	1	18 8 0
Cowherd - - -		Do.	For 1 year - -	12 0	1	12 0 0
Blacksmith - - -	—	Do.	On 2 ploughs - -	3 0	1	3 0 0
		Rab	On 6 rotations at 1½ seers, @	0 9	3 p.m.	0 10 9
Carpenter - - -	—	Grain	On 2 ploughs - -	3 0	1 m.	3 0 0
		Rab	6 rotations at 1½, @ -	0 15	3 p.m.	1 2 0
Potter - - -	—	Grain	On 2 ploughs - -	0 30	1 m.	0 12 0
Peria - - -	2	Rab	6 rotations at 5 seers, @ -	0 30	3 p.m.	2 4 0
Jhoka - - -	—	Do.	Do. 3 do., @ - -	0 18	—	1 5 7
Workman - - -	—	—	Do. 4 do., @ - -	0 24	—	1 12 10
Muthia - - -	—	—	Do. 2 do., @ - -	0 12	—	0 14 5
Hire of sugar-mill - -	—	—	—	—	—	0 12 0
Ditto karhai - -	—	—	—	—	—	3 0 0
Wood - - -	—	—	—	—	—	2 0 0
Oil - - - -	—	—	—	—	—	1 0 0
Weeding sugar-cane and cotton - -	—	—	5 seers each - -	1 10	—	1 4 0
Reaping wheat - -	10	—				
						54 5 7

7. Other charges—

Iron - - - -	- 3
Hackery and wheels - -	- 3
Bullocks - - -	- 10
Salt and spices - - -	- 5
Cloth - - - -	- 5
Shoes - - - -	- 3
Utensils - - - -	- 1
Total - - -	- 30

8. Dwelling-houses—
For family three kothas.
Cattle three ditto.
One dehliz.

9. Cattle—

Bullocks - - - -	- 8
Calf - - - -	- 1
Buffalo - - -	- 1
Calf of ditto - -	- 1
Total - -	- 11

10. Other property—

Thalis - - - -	- 3
Lotas - - - -	- 4
Katoras - - - -	- 3
Parat - - - -	- 2
Tokni - - - -	- 1
Tawa - - - -	- 1
Bucket - - - -	- 1
Karhai - - - -	- 1
Total - - -	- 16

Jewels worth Rs. 200.

11. The grain produced is used for food, and what remains at the end of the year is sold.

12. Surplus; any savings are spent in marriages.

13. Debt. Nil.

Total income	422	3	1
Deduct value of fodder kept in store	52	4	9
Total	369	14	4
Charges	257	4	4
Profit	112	10	0

Example XV.—Mula, Banjára, resident of Lachera, pargana Muzaffarnagar, occupancy tenant of Semli, 10th September 1878.

1. The holding comprises 23 bighas 9 biswas pucka. The whole is cultivated; none left for grazing; cattle graze on fields or feed on bhusa kept in store.

2. The family consists of:—

Himself	1
Nephews	4
Sons	2
Wives of brothers and nephews	5
Nephews' sons	3
Ditto daughters	2
	17

3. Food grain:—

Description of crop.	Area in pucka bighas and biswas.	Yield per bigha pucka.	Total Yield.	Rate per acre.	Value.
Kharif.		M. s. c.	M. s. c.	M. s.	Rs. a. p.
Urd	2	2 10 0	4 20 0	0 25	7 3 3
Moth	1	2 10 0	2 0 0	0 30	3 0 0
Maki	1	5 10 0	5 10 0	0 30	7 0 0
Rice	2	3 0 0	6 0 0	0 30	8 0 0
					25 3 3
Fodder, chari	4	18 0 0	72 0 0	5 0	14 6 3
Bhusa of urd	—	—	4 20 0	4 0	1 2 0
Ditto wheat and barley	—	—	75 0 0	5 0	15 0 0
Ditto gram and moth	—	—	11 10 0	4 0	2 13 0
					33 5 3
Rabi.					
Wheat	7	4 20 0	31 20 0	0 25	50 6 4
Gram	2	4 20 0	9 0 0	0 30	12 0 0
Barley	1	6 0 0	6 0 0	1 0	6 0 0
Mustard	With wheat.	0 7 8	1 12 8	0 15	3 8 0
					71 14 4
4. Other than food grain.					
Cotton	1	2 25 0	2 25 0	0 10	10 8 0
	—	—	—	—	—
Safflower seed	With gram.	1 5 0	2 10 0	0 25	3 9 7
Ditto flower	Ditto.	0 7 8	0 15 0	0 3	5 0 0
					13 1 7

5. Rent payable Rs. 39-7 per annum.

6. Cost of labour.

Designation of Workmen.	Number.	Grain or saccharine allowed.	How calculated.	Total grain or saccharine allowed.	Rate.	Value.
Carpenter	1	Grain	Allowed, per annum.	1 10	0 30	1 10 8
Blacksmith	1	—	—	1 10	0 30	1 10 3
Potter	1	—	—	0 25	0 30	0 13 4
						4 2 8
Reaping rabi and weeding kharif crops	15	—	—	1 5	0 30	1 8 0
						5 10 8

7. Other charges—

Iron	2
Hide	2
Salt and spices	2
Cloth	2
Shoes	1
	9

8. Dwelling-houses—

For family 1 house containing—

Dalán	3	Kothris	2
Kothas	3	Dehliz	1

For cattle, 1 kotha.

For fodder, 1 ditto.

9. Cattle—

Bullocks	4
Buffalo	1
Cow	1
Calf	1
	7

10. Other property, utensils—

Tokni	5	Chamca	4
Lota	6	Tawa	3
Thali	7	Parat	4
Katora	5		
Karhai	3	Jewels *nil.*	
Glasses	3		

Pandit Rac hakishen.

Muzaffarnag

11. Grain kept in store for food, 25 maunds.

12. Surplus. Has never been able to save; the whole income is spent. A small sum is realised by letting out the bullock-cart.

13. *Debt.*—Six years ago Rs. 100 were borrowed for purchase of bullocks. Dealings have continued ever since, and the debt now amounts to Rs. 300; interest is charged at 24 per cent. per annum.

	£	s.	d.	£	s.	d.
Total income - -	209	8	4			
Deduct value of fodder kept in store -	33	5	3			
				176	3	1
Other charges - -				54	1	8
Profit - - - -				122	1	5

Mr. J. Smit

Meerut.

Mr. J. Smith, collector of the district, personally inquired into the circumstances of 10 cultivators in 10 villages, selected from all parts of the district. The instances chosen appear to be tenants holding more land than is usual, the smallest area being about 6 acres. The information he collected is given in too ample a form for reproduction, and it will be sufficient to show the average results for the 10 tenants. They held on an average 30 acres apiece, of which 25 acres were under good crops, and the outturn was 244 maunds of food, and 260 Rs. worth of other crops, chiefly cotton, indigo, and sugar. The average number in each family was 15, and their yearly consumption of food was 111 maunds, or a little over 7 maunds or ¼ of a ton per head. The value of their surplus crop was Rs. 174, which, added to the non-food crops gave a disposable capital of Rs. 434 to each tenant. Against this have to be set the following items:—

	r.	a.	p.
Wages of hired labourers -	64	4	6
Other expenses (viz., seed grain, water rent, cost of expressing sugar, fees to village menials, &c. - - - -	116	12	0
Rent - - - -	115	1	0
Average yearly cost of bullocks -	27	0	0
Average yearly cost of agricultural implements - -	8	1	6
Purchase of necessaries of life not produced on the land -	67	6	0
Total - - -	398	9	0

Average surplus to each tenant Rs. 35 7 0

These 10 cultivators owned between them the following stock:—

Ploughs - - - -	27
Bullocks - - - -	68
Cows - - - -	46
Buffaloes - - - -	48
Bullock carts - - -	11
Sugar mills - - -	3
Horses - - - -	6
Bullock carriages (for riding in) -	2

Out of 148 persons composing the 10 families, 37 wore cloth of English and 111 cloth of native make. Five were in debt, and owed Rs. 1,550 between them. This is rather less than the value of the annual income from their land, after deducting the food required for consumption.

Mr. Smith further took a census of the 10 villages, and found that they contained 3,916 cultivating proprietors and 2,607 tenants. Of the former class 48 per cent. were indebted, owing on an average Rs. 35 each, of the latter 67 per cent. owing on an average Rs. 17 each.

Raja Lachn Singh.

Bulandshah

The degree of success in agricultural matters depends not only on the description of soil and amount of rent-rates, but also a great deal on the nature of the occupancy tenure and the caste of the cultivator. A Jat and a Gujar holding the same kind of land and paying the same rent-rate are found to differ from each other very much in their prosperity, simply because the former is much more enterprising and frugal than the latter, and the women of his house assist him in field work, while those of the other merely do house work. Again a khudkasht proprietor or an occupancy tenant generally improves his holding by money and labour, whereas the tenant-at-will does no such thing. In calculating the produce as well as the food consumption in the annexed statements it has been taken into consideration that during the harvest seasons, or four months in the year, no tenant buys food grain, but uses the new produce of his own field, and counts the remainder as the outturn from which to pay his landlord and the banker. When grain becomes dear, the poorer tenants use carrots, methi, and cucumbers, as a part of the daily food, while butter-milk, boiled with ground makka, or juár, is largely consumed even in favourable times; cloth expense is generally very little amongst the cultivating classes. The women spin thread from their own cotton and get coarse cloth woven by the village weaver. For defraying wedding or funeral expenses, there is a very useful custom, generally among the villagers and chiefly among the lower classes, which is called nota, or payment of invitation presents. Each neighbour or friend pays at such ceremonies a rupee or eight annas to the head of the family, and the sum so collected is usually sufficient for meeting all the charges of the ceremony including the feast. Thus every householder expends annually a small sum in these presents and gets the whole back on the occasion of a marriage or death in his own family.

It will be observed from statement A. that very few tenants keep grain in their house for the daily expenditure. This is owing to the fact that the baniya supplies them with grain and other necessary articles for four months before each harvest, and also pays the rent for them, and when the produce of the field is ready, he takes nearly the whole away in satisfaction of these advances and interest. For the grain supplied he charges half anna per rupee above the market price, and when he takes the produce home, he credits its value to the owner's account at the rate of half anna per rupee less than the market value. Besides these discounts and premiums he takes interest at 25 per cent. per annum. Notwithstanding these heavy charges the banker's failure is calamitous to the village. In fact the baniya is as it were the common stock-keeper of the village community, and if he fail the whole community suffers. He is very seldom able to recover his debts in full. When the debt becomes old and large the debtor generally convenes a panchait, and offers the lagana, which means that he is willing to let the creditor take all the moveable property he possesses. The panchait acting as a court of insolvent debtors fixes the prices of each article rendered (generally cattle), and this price is almost invariably much higher than the market price. When the old account has thus been cleared off the new account begins, and the balance, if any, struck by the appraisers is put down as the opening balance on the debit side in the baniya's bahi. It often happens that when a man is too much involved in debt he secretly deserts the village, carrying away what cattle or other things he pos-

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sesses. Under these circumstances the village baniya is seldom a lakhpati (or owner of a lakh of rupees). Cost of house repairs in villages is very little or nothing. The men make their own walls and chhappers and the women plaster the walls with clay and cowdung. Houses are generally made with mud and a few with sunburnt bricks. Those with flat roofs are called kothas, and the thatched ones chhaniha. Among the higher castes a house is separately enclosed with walls and has a dubari (portico) for the entrance, but among the poorer classes several families have their houses in the same enclosure with a common doorway. Cattle are kept in one of the rooms in the house if there is no separate enclosure (gohra) for them. Among the items of income (of the cultivators) other than the produce of land, the principal one is the yield by cattle, and it consists of the sale proceeds of ghi and homebred cattle.

Generally speaking, cultivators invest their savings in jewels which they sell or mortgage again in time of need, but I believe there are not more than 10 or 12 in a 100 who are in a position to do so, the remainder being more or less in debt. The debts seem chiefly to be due to the exorbitant charges of the money lenders and in some cases to litigation and marriage expenses. The average amount of debt per tenant comes to Rs. 108 for ghair maurusis, Rs. 176 for maurusis, and Rs. 63 for khudkasht holders, or Rs. 40, 60, and 13 per cent. respectively on their annual incomes. The reasons why the debt of a maurusi tenant is more than that of a ghair maurusi one seem to be these that (1), knowing that the maurusi is not likely to abandon his home or holding the baniya is more willing to lend money to him than to a tenant-at-will, and (2), having no permanent right in his holding, the tenant-at-will often abandons the village, and when he takes his abode in a distant village, all the old debts are supposed to be washed off. The baniya takes no bonds and his ledger is not as accurate as it ought to be. Hence he does not follow the runaway tenant to realise his debts by suit. It is on account of these risks that the village banker charges high interest and is still in the long run not a very wealthy person.

(The following figures are supplied by Raja Lachman Singh, as the results of his personal inquiries into the condition of 46 cultivators in 12 selected villages.)

BULANDSHAHR.

Averages per Holding per Annum.	Proprietary Cultivators.	Occupancy Tenants.	Tenants-at-Will.
No. of Cases inquired into - - - - -	11.	16.	19.
	Bighas.	Bighas.	Bighas.
Average area per holding - - - - - -	34 7 0	22 0 0	25 7 0
	Mds. s. c.	Mds. s. c.	Mds. s. c.
„ quantity of food-grain produced per holding - -	152 18 0	114 30 0	126 10 0
	Rs. a. p.	Rs. a. p.	Rs. a. p.
„ value of „ „ - -	176 11 0	133 7 0	141 5 0
„ „ of other produce „ - -	216 4 0	81 3 0	99 8 0
„ „ of total produce „ - -	393 0 0	214 0 0	240 13 0
„ other income „ - -	87 6 0	57 12 0	25 1 0
„ of total income „ - -	480 6 0	272 6 0	265 14 0
„ rent or revenue „ - -	75 0 0	78 8 0	90 6 0
„ cost of hired labour „ - -	60 4 0	12 2 0	12 10 0
„ interest paid „ - -	32 7 0	36 11 0	25 11 0
„ of other charges „ - -	83 3 0	47 12 0	48 9 0
„ of domestic charges „ - -	180 13 0	110 6 0	83 4 0
„ of total charges „ - -	431 11 0	285 7 0	260 8 0
„ profit „ - -	48 10 0	—	5 5 0
„ loss „ - -	—	13 1 0	—
„ number of dependants „ - -	12·7	11·7	9·7
„ debt „ - -	63 10 0	172 4 0	108 7 0
„ number of bullocks „ - -	5·3	3·7	2·8
„ „ of other cattle „ - -	8·0	3·7	2·8
	Mds. s. c.	Mds. s. c.	Mds. s. c.
„ quantity of grain in store „ - -	59 20 0	3 30 0	1 2 0
	Rs. a. p.	Rs. a. p.	Rs. a. p.
„ value of „ „ - -	119 0 0	7 8 0	2 2 0
„ „ of cattle „ - -	321 0 0	159 14 0	126 9 0
„ „ of other moveable property „ - -	209 1 0	15 5 0	3 11 0
„ „ of total property „ - -	649 0 0	182 11 0	132 6 0
„ „ of produce per bigha - - - -	11 7 0	9 12 0	9 8 0
„ rent or revenue per „ - - -	2 2 11	3 9 1	3 9 1

It is impossible to reprint the accounts given (interesting though they are) of all the 46 holdings, but a few are excerpted to show the details on which the above figures are based.

Mauza Semli, pargana Baran.—This village has no canal irrigation, but the proprietor has constructed five large masonry wells, and thereby made nearly the whole of the cultivated area irrigable. Rent-rates are so high that, with one or two exceptions, all the tenants are largely in debt. Except one Gujar and one Chamár, all the tenants are Lodhas, a very industrious class whose women assist the men in field work. A majority of the cultivators are maurusi, but there is no difference in the rates paid by maurusi and ghair-maurusi tenants.

The following are the statistics regarding three tenants of this village taken at random.

(1.) Kalwa Lodha, occupancy tenant of bighas 13–13, viz., 2 dry and 11–13 wet. He is one of the poor tenants.

Family, 8.		Cattle, 4.	Property.
Adults.	Children.		
1 self. 1 brother. 1 son. 1 nephew. 1 wife. 1 daughter-in-law. 1 niece-in-law.	1 grand nephew.	2 bullocks. 1 cow. 1 buffalo. Worth Rs. 70	Rs. 200 in debt. No grain or property.

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Bulandshah

Income.	Mds.	Rs.	Charges.	Rs.
2 bighas makka	15	15	Rent	65
½ bigha cotton	4	7	Seed	8
3½ bighas juár	14	14	Instruments	8
4½ „ wheat	23	34	Interest	48
1 bigha kasúm		16	2 bullocks of Rs. 30	4
½ „ carrots for use		—		
3–13 „ barley	28	28	Total	133
tará and sarson	5	12	Domestic expenses as detailed below.	
15–13 Total (2 bighas 2nd crop)		126	Grand total	213
Earnings of two men of the family who work as labourers for others		72	Deficiency of Rs. 15, hence debt.	
Total		198	This tenant is usually about Rs. 150 in debt.	

Detail of Domestic Expenses.

	Rs.
Food, 7 sers a day, or 43 mds. for 8 months	43
Clothing	20
Spices, &c.	12
Notás (invitation presents)	5
Total	80

(2.) Silú Lodha, occupancy tenant of bighas 24–11, of which four are dry and the remainder irrigated. He is one of the poor class tenants, usually Rs. 200 in debt.

Family, 8.		Cattle 4.	Property.
Adults.	Children.		
1 self. 1 father. 1 brother. 1 mother. 1 wife. 1 sister-in-law.	1 son. 1 daughter.	4 bullocks, worth Rs. 90.	No grain or property. Rs. 200 in debt.

Average income.	Mds.	Rs.	Charges.	Rs.
1 bigha makka	7	7	Rent	108
2½ bighas cotton	3	39	Seed	12
4 „ chari and juár	12	12	Instruments	8
¼ bigha carrots } for use ½ „ juár } for use			Interest	48
3 bighas wheat	56	84	4 bullocks of Rs. 90 to work 8 years	11
1 „ kasúm		16	Total	187
8–6 „ barley and peas	65	65	Domestic expenses as detailed below	69
tará and sarson	5½	14	Grand total	256
25–11 Total (1 bigha 2nd crop)		237	Deficiency of Rs. 19, hence debt.	

Detail of Domestic Expenses.

	Rs.
Food, 6 sers a day, or 36 mds. for 8 months	36
Cloth	16
Spices, oil, tobacco, &c.	12
Notá	5
Total	69

(3.) Dabi Lodha, occupancy tenant of 43 bighas—4 dry, 39 irrigated. One of the well-to-do (comparatively) tenants usually Rs. 200 in debt.

Family, 9.		Cattle, 13.	Property.
Adults.	Children.		
1 self. 1 wife. 1 son. 1 daughter-in-law. 2 brothers. 2 sisters-in-law.	1 son. 2 daughters. 5 nephews. 3 nieces.	6 bullocks. 2 buffaloes. 4 calves. 1 horse. Worth Rs. 260	Rs. 150 in debt. No property but 10 maunds of grain at present.

Average income.	Mds.	Rs.	Charges.	Rs.
4 bighas makka	30	30	Rent	186
8 „ juár	32	32	Seed	25
2 „ cotton	2	26	Hired labour	36
3 „ chari for use		—	Instruments	10
13 „ wheat	91	136	Interest	36
6 „ barley	48	48	4 bullocks Rs. 120	15
7 „ gojai	52	65		
2 „ peas	14	14	Total	308
2 „ kasúm		30	Domestic expenses as detailed below	141
Tara and sarson	14	35		
47 Total (4 bighas 2nd crop)		416	Grand total	449
			Deficiency of Rs. 33, hence debt.	

Detail of Domestic Expenses.

	Rs.
Food, 12 sers a day, or 73 mds. for 8 months	73
Clothing	38
Spices, &c.	20
Notás	10
Total	141

(1.) Naná Ját, cultivating proprietor of 20 bighas and occupancy tenant of 19 bighas; total, 39 bighas, all irrigated from the canal. A well-to-do tenant; lives in a better style than the average. Women assist in field work.

Family, 7.		Cattle.	House of Mud.	Property.
Adults.	Children.			
1 self. 1 wife. 3 sons. 1 daughter-in-law.	1 son.	4 bullocks. 4 buffaloes. 2 cows. 1 pony. Worth Rs. 460.	2 large kothás. 1 „ dalán. 1 „ dubari. 2 „ thatched houses for cattle. 1 flat-roofed do.	Rs. 500 worth of jewels; 80 mds. of grain in store.

Average Income.	Mds.	Rs.	Charges.	Rs.
6 bighas sugarcane	—	300	Revenue of 20 bighas	45
1 bigha indigo	—	10	Rent of 19 „	38
6 bighas cotton	7	91	Wages of labourers	36
6 „ maize	40	40	Wages of coolies for weeding crops	6
13 „ wheat	80	120	Implements	10
3 „ barley	21	21	Seed	25
5 „ peas	30	30	Water rent	69
6 „ chari and hemp for use.			4 bullocks, worth Rs. 300	38
46 total (7 bighas 2nd crop).		612	Domestic expenses (detailed below)	186
From buffaloes and cows		50	Grand total	453
Grand total		662	Profit Rs. 209, partly invested in jewels or landed property or grain, and partly expended in ceremonies.	

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NORTH-WESTERN PROVINCES AND OUDH.

Raja Lachman Singh.

Bulandshahr.

Detail of Domestic Charges.

	Rs.
Clothing for eight persons - - -	40
Spices, sugar, oil, tobacco, &c. - -	30
Food, 8 sers a day, or 49 maunds for eight months (half wheat and half coarse grain)	61
Chaupal expenses - - - -	30
House repairs - - - -	15
Notás - - - - -	10
Total - - -	186

(2.) Bhao, Ját, proprietary, cultivator of bighas - - - 20·11

Maurusi, cultivator of - - 5·0

Ghair-maurusi, cultivator of - 17·0

Total - 42·11 { 14 dry. 28 wet.

Is a well-to-do tenant. Has recently bought land in a village for Rs. 850.

Family, 27.		Cattle, 21.	House, mud made, two enclosures.	Property.
Adults.	Children.			
1 self. 1 father. 4 brothers. 2 sons. 2 nephews. 1 wife. 4 sisters-in-law. 1 mother. 1 daughter-in-law. 1 nephew's wife.	3 sons. 5 nephews. 1 niece.	6 bullocks. 1 buffalo. 6 cows. 7 calves. 1 horse. Worth—Rs. 486.	4 kothas. 1 atari. 1 atta. 1 Kothri.	60 mds. of grain; Rs. 100 worth of jewels; Rs. 500 in debt on account of purchasing land.

Average Income.			Charges.	
	Mds.	Rs.		
3 bighas makka	21	21	Revenue of bighas 20-11	28
8 „ sugarcane	—	400	Rent of 22 bighas -	57
2 „ cotton	2·14	30	Water rent - -	54
5 „ chari for use.			Hired labour - -	36
17 „ wheat	102	153	Implements - -	10
2 „ oats for use of cattle	—	—	Weeding - -	3
8½ „ barley	68	68	Digging cane - -	24
			Six bullocks, worth Rs. 300	38
			Seed - - -	23
45½ total (3 bighas double crop - -		672	Total - -	273
From cows and buffalo and horse - -		100	Domestic charges (detailed below) - -	402
From cart - -		50	Grand total -	675
Grand total -		822	Profits, Rs. 147.	

Detail of Domestic Charges.

	Rs.
Food of 27 persons, 20 sers a day, or 122 maunds for eight months (half wheat and half coarse grain) - - -	153
Clothing, Rs. 5 each adult, and Re. 1 each child - - - - -	99
Spices, sugars, oil, &c. - - -	40
Chaupal expenses - - - -	30
House repairs - - - -	15
Food for horse and bullocks (6 sers a day)	55
Notás - - - - -	10
Total - - -	402

(3.) Zulfi, Ját, cultivating owner of 10 bighas and ghair-maurúsi of bighas 5·6, all irrigated from canal. Is one of the middle-class tenants, never in debt.

Family, 4.		Cattle, 5.	House of Mud.	Property.
Adults.	Children.			
1 self. 1 brother. 1 nephew. 1 wife.	Nil.	2 bullocks. 1 heifer. 1 cow. 1 calf. Worth—Rs. 108.	1 kotha. 1 dubari. 2 thatched rooms.	7 mds. grain. No other property. No debt.

Average Income.			Charges.	Rs.
	Mds.	Rs.		
1-6 bighas cotton	1	13	Revenue of 10 bighas -	25
1-15 „ sugarcane		70	Rent of bighas 5-6 -	40
3-7 „ chari for cattle.	—	—	Seed - - -	10
5-6 „ indigo	—	50	Water rent - -	31
2-4 „ barley	13	13	Instruments - -	5
6-14 „ wheat	44	66	Two bullocks, Rs. 80	10
20-12 total (5-6 bighas, second crop) -		212	Total -	121
			Domestic charges (detailed below) -	83
			Grand total -	204
			Profit, Rs. 8.	

Details of Domestic Charges.

	Rs.
Food, 4 sers a day, or 24 maunds for eight months (half wheat and half barley) -	30
Cloth - - - - -	20
Spices, &c. - - - - -	18
Notás - - - - -	5
House repairs - - - -	10
Total - - -	83

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Example 1, *Village Khanpur, Pargana, Sambhal.*—A purely agricultural village, but close to the large town of Sambhal and similar to the sarais of Sambhal in its constitution, a very large portion of the area being comprised in small properties (called milks), belonging for the most part to other persons than the owners of the village in which they are included geographically.

The following statement in detail explains the constitution of the village clearly. I have not given the names of the owners of each property, as there are so many; they would occupy a great deal of space with no advantage: nor have I considered it necessary to show the area and revenue of each milk separately where it is below 50 bighas, *i.e.*, about 7½ acres:—

		Whole Area.	Cultivated.	Revenue Assessed.
		Acres.		
I.—Khalsa land.	Patti No. 1 - -	58	42	75
	„ 2 - -	56	38	63
	„ 3 - -	55	45	75
	„ 4 - -	55	42	70
	Land common to all 4 pattis - -	1½	—	
	Total - - -	225½	167	283

[N.B.—Each patti is separately managed, and virtually quite independent of the other. The land in common is only a pond and the village site. Only tenants live on the latter, the proprietors all live in Sambhal.]

	Acres.	Acres.	Rs.
II.—Milk No. 1 - -	8	7	14
,, 2 - -	51	46	70
,, 3 - -	15	13	15
,, 4 - -	32	28	44
,, 5 - -	15	14	26
,, 6 - -	9	9	14
,, 7 - -	14	11	24
,, 8 - -	27	21	37
,, 9 - -	97	88	130
,, 10 - -	15	13	22
,, 11 - -	10	10	17
Milks Nos. 12 to 22 -	42	about 21	about 54
Total - -	335	281	467

N.B.—It will be seen that the area of the milks exceeds that of the khalsa, a very common feature in the constitution of these villages near Sambhal; also that with the exception of the smaller plots, several of which are groves, the land of the milks is as a whole highly cultivated; the per-centage of land uncultivated being extremely small.

Except the owners of three or four of the smaller plots, all the proprietors of the milks are non-resident, most of them being inhabitants of Sambhal, but some living at a considerable distance.

The revenue of these plots which pay over Rs. 50 is paid by the proprietors direct; that of those paying less through the two lambardárs, on whom a rather burdensome task is thus thrown.

Some of the milks are leased, in the others collections are made by the owners themselves or by their agents. In any one of the three cases, the landlord or his representative only pays a flying visit to the village two or three times in the year. Under this state of things there is very little "management;" the tenants look after themselves and their land, and it speaks well for them that matters work as smoothly as they do.

Only about 21 acres are cultivated by the proprietors of the land, and part of this, though classed as their sir, is actually cultivated by tenants entered as their shikmis. About three acres more are held by non resident tenants; all the rest is held by resident tenants.

Their exact number I have not been able to ascertain; but, including women and children, it is about 350. From the constant repetition of holdings, owing to the number of different properties in which one man sometimes cultivates, the record of the number of holdings gives no sufficient clue to the number of individuals.

There are, however, about 80 inhabited houses in the village, and of these only seven are occupied by non-agriculturists. Taking 70 houses as occupied by agriculturists, the average number of inhabitants for each may be taken as between four or five, probably nearer five. So there are between 300 and 350 cultivators; of these 95 are men in whose name land is recorded, and the rest are their families.

The average rent paid on the better class land is Rs. 4 6a. an acre, that on the inferior land Rs. 3 4a., and on some fields Rs. 2 7a.

The soil is all naturally light and sandy; near the village it has, however, been worked up, and fetches the higher rent above mentioned.

On the whole the tenants as a body are well off. The following examples are taken of a tenant's and a labourer's condition at this particular time (January):—

Tenant.

Chajju, son of Dilla Bhagwan—

	Acres.		Rs.	a.	p.
Holds in patti No. 3 - -	3	at rent of	11	0	0
In a milk belonging to the same proprietors - -	1¾	at rent of	5	12	0
Also with his cousin, Bidha Bhagwan, in another milk -	½	,,	2	2	0

Has planted this year 1 acre cane;
,, ,, ½ acre cotton;
,, ,, 2 acres bajra, mung, urd;
,, ,, ¾ of an acre wheat, including the field held with Bidha.

He has a wife and two children, was free from debt till last year (he says), when the harvest being very bad, he borrowed Rs. 36 from the sugar manufacturers with whom he has dealings for the juice of his cane. The cane this year being very poor, he has only paid back Rs. 30.

He has lived this year on the money borrowed, and on the produce of the two acres kharif. Intends to sell some cotton he has left to pay his rent, but will probably have to borrow again to pay part of it, and to get on till the rabi is ready for cutting.

His wife prepares the cotton for sale, and helps in the fields at different times; one of his sons is old enough to do some work too.

Yesterday (January 13th) he got up about 5.30, having slept in a shed by the kolhu where his cane was being crushed, and assisted by a hired labourer and his own son worked at crushing cane all day, though from about 6.30 with occasional rests, when the vessel used for holding the juice was filled and required emptying; he also changed occupations every two hours when his pair of bullocks was taken out and another pair changed.

Three pairs of bullocks were worked, one of his own and two others of other tenants, with whom he had arranged to co-operate.

Whilst his own pair was working he drove them. When they were taken out he looked to their food, and then busied himself cutting the cane into pieces for crushing, collecting the crushed pieces, and other miscellaneous work.

After each vessel was filled (in about four hours) they all rested and smoked, and after the third had been filled they eat their food; this consisted of jowar and urd, ready made up into cakes. Work stopped about seven in the evening, after which they had another meal of the same food, and went to sleep about eight.

The allowance of food to the labourers was half a seer at each time, and he himself took about the same.

The labourer, Kallu, Chamar, lives in the village. He has a house with two rooms; no cattle, and no land. He lives by day-labour, and supports a wife and a daughter aged about five. His wife occasionally does some work in the fields, but usually stops at home to look after the house and child.

At present Kallu gets his daily food, one seer of either jowar or bajra, made up ready into cakes, with ghi, and a few pieces of sugar-cane to flavour it. He lives at the shed where the kolhu stands day and night, and works throughout the day, beginning at about 6, by cleaning out the kolhu and feeding the cattle and getting things ready. At about 6.30 or 7 regular work begins, and his share is to keep the mill supplied with pieces of cane, and to keep the pieces even under the crusher.

Like the others he gets a rest whenever a vesselfull has been crushed, *i.e.* once every three or four hours. He eats his food at about noon, and at evening about 7, after all the work is over. He sleeps in the shed, receiving a blanket from his employer, which he only retains as long as he is employed in his service, and has to give up afterwards. He also, however, gets one rupee eight annas for every "harda" (100 maunds) of cane juice (really about 60 maunds weight in ordinary measure) which is pressed out.

It takes about a week to press one harda, so that just at present he is in receipt of about eight rupees a month, besides his own food; but of course this is an exceptional state of things. He is working hard, and

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there is some risk of injury, as if his hand got caught under the crusher he would probably lose the use of it.

His wife and child live (he says) on about two rupees a month. What he makes now will pay his debts (three rupees some annas), and keep him in the hot weather when he finds little to do. From now till after the rabi has been cut and threshed he expects to have sufficient work to do to support himself and his family without touching what he can lay by now.

He spends about two rupees a year on clothes. He has a "kamal" (blanket) of his own which he bought ten months ago. He expects this to last him for another year or more. Neither he nor his wife wear shoes; the two rupees is spent on body clothes, and when he buys a new kamal this is an extra expense costing about one and a quarter more. He only gets a new kamal when he is in funds after work on the cane mills.

Example 2. *Mauza Rehri, Pargana Hassanpur.*— This is only partly an agricultural village. It is divided into two pattis or shares, one of 12 biswas and the other of 8 biswas, taking the whole village at 20 biswas, as is the custom in this pargana.

The areas of the two pattis are:—

Cultivated.		Culturable.	Barren.	Total.
Biswas.	Acres.	Acres.	Acres.	Acres.
12	209	352	23	584
8	121	186	12	419

Only 26½ acres are held in sír or as home farm, all the rest is held by tenants.

291½ acres with right of occupancy, and 4½ without; the remaining 7½ acres being held rent-free for service.

There are no milks.

Each patti has a separate lambardár, and rents are collected separately. There are altogether 1,334 persons residents in the village; of these 820 are agriculturists and 514 non-agriculturists.

The zamindars live in the neighbouring village of Rehra. The tenants of Rehri hold a few fields in Rehra; but generally speaking, the cultivation of both villages is carried on by resident tenants.

There are 184 men who live by other means than agriculture. Of these 37 are banias, traders, and money-lenders, who keep shops; 56 are manihars (makers of the rough glass called kach); six others, who are also manihars, but do not make the glass, earning their money by working it up into small articles such as buttons; 32 dhunias, who weave and clean cotton; five dhobis, who live by washing clothes; two garariás, who keep sheep and earn a living from the sale of kamals made from the wool; five beggars, who do no work of any kind; five bhangís, who act as scavengers); one nadaf, or weaver by profession, four rangrezes, who dye cloth; two telís, to extract and sell oil; seven chipís or printers, who stamp patterns on cloth; one carpenter, two carriers, who keep bullocks and ponies for carrying grain; and 17 others who live by day-labour of various kinds—digging, reaping, making walls, &c., whatever they can find to do.

The number of persons supported by these 184 men may be estimated at about 330, rather less than two to each man. The cultivators, including women and children, number 820. They are, as a rule, well to do. The following examples show the condition and an ordinary day's work of a cultivator and of a labourer who owns no land:—

Nathu, son of Ganga Ram, Murao, cultivator.— Holds 20 bighas 4 biswas,* with right of occupancy, at a rent of Rs. 14 4 0 cash in patti 12 biswas. He has a family of a son about 14 years old, who helps in cultivation, a wife, a sister-in-law (a widow), and a child about three years old. The family expenses are all in one, and amount to about 5 annas a day, the total coming to about Rs. 115 a year, besides what they spend on clothes, estimated as Rs. 22 a year more.

The following is an account of a day's work done about a week ago (January 16th):—

He rose about 6.30 and let out his bullocks, taking them to his field in which wheat is sown. There tying them up, he and his son gave them their fodder, and then set to work to irrigate a field from a kacha well, using the lever (dhenkal) to bring up the water in a small earthen vessel. They worked at this from about 7.30 till noon, taking turns at the lever and at spreading the water over the field. About noon they took their meal of dál, made from moth and cakes of joár. They eat this on the spot, resting for about half-an-hour. The food was brought them by their wives ready for use, with water and salt; whilst working they eat one or two carrots (raw). Both afterwards worked at the well till about 3 p.m., first as a relief digging up carrots in another field for about half-an-hour; these were carried home by the son as Nathu dug them up, the field being close to their house. After 3 p.m. they separated, Nathu going off to look after a field sown with tara, in which he set up some scarecrows, and his son taking off the cattle to let them graze for a short time before shutting them up. Nathu, on his way home, about 5 p.m., plucked some methi (a plant with small leaves, used to flavour the "roti," or gram cakes, eaten by the poorer classes); depositing this, he went off to scare away the birds from their evening meal in the fields and also to watch his carrot crop against trespasses of cattle returning to the village about this time. His son tied up the cattle in their shed about 5 p.m., and gave them water and bhusa. Nathu returned home about 7.30 p.m., and the family then took their evening meal; this was a little less than half a seer of joár cake with methi (instead of salt) per head for the adults and the elder son.

After this was over Nathu went out and passed the night under a small shelter set up at the corner of his field of carrots, in order to guard it against thieves or loose cattle. When he first went out in the morning he had on a dhoti (waist-band), a mirzai or short coat of rough cloth (garhá), and a thick razai, padded with cotton wool. He laid aside the razai when he began irrigation, and put on a pagri of cloth. After about 10 a.m. he took off the mirzai, putting it on again after his midday meal. After he stopped irrigating he put on a chadar (a coarse kind of sheet), worn like a shawl. He took his razai again when he went out to sleep at his field.

Mehtab, son of Ilahi Bakhsh, Hajjam, labourer, lives with his mother, an old woman of about 50; has no wife nor family. On the same day as above described rose about 7 a.m., went to the house of a bania and began work cleaning cotton, about 7.30. This work is done on contract, two seers of cleaned cotton being paid for at the rate of one anna (the cotton of course belonging to the bania). His mother went with him and worked too. At noon they got one roti of moth and some curds between them, about one quarter of a seer each; set to work again as soon as they had disposed of this, *i.e.*, after about a quarter of an hour, and worked till sunset (about 5.20). Between them they cleaned two and a half seers of cotton, *i.e.*, they extracted two and a half seers of wool separate from the seed, which weighs about three times as much as the wool; so perhaps it is more correct to say they cleaned 10 seers.

For this they were entitled to one anna and three pie; out of this they were cut six pie advanced a few days before, and carried off only nine pies. They went off with this and gathered some "bathua" (a wild plant which is edible); they had some makka (sufficient for about two days) laid up at home; the mother made some cakes of this, grinding it on a stone, and they both eat it with the bathua. Each got about three-quarters of a seer of the makka cake and one quarter seer bathua by about 8 p.m. After this they went to sleep.

During the day Mehtab wore a small pagri of dirty white cloth, a dhoti of garha, and a very old padded

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* A little over three acres.

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mirzai. At night he had an old kamal, which he bought more than a year ago partly on credit, but has since paid for.

His yearly expenditure is about Rs. 32 for food, including that of his mother, and about Rs. 3 8 0 for clothes of all kinds. The food they get from their employés is included in this estimate. Of course on the day described it was paid extra, besides the cash payment on the cotton cleaned.

Example 3.—Dhabharsi, Parganna Hassanpur.—An agricultural village situated on the high sandy land, about seven miles from Rehri, which is on the low-lying "khadar" land.

The village is primarily divided between two sets of sharers, one Muhammadans, the other Hindus; both were originally Hindus (Tagas), but the ancestors of the first set turned Muhammadans about 300 years ago.

The areas are as follows:—

—	Whole Area.	Cultivated Area.
	Acres.	Acres.
1. Muhammadan patti - -	346·43	116·43
2. Hindú patti - - -	351·79	162·65
3. Land of 11 small properties called milks.	22·99	10·56

Within each patti (share) there are a large number of sharers who have distributed the land between them, so that the tenure is really what is called bhaiachára, *i.e.*, rights are represented by so much land, and not by a share in the profits of the whole patti.

The sharers themselves cultivate almost all the land in the Muhammadan patti; but in the Hindu patti, where the zamindars are rather less numerous, there are a good number of tenants who hold from the different zamindars, a field from one and a field from another, the land being broken up as before mentioned.

The whole population is 2,340; 1,845 agriculturists and 495 others. Of the agriculturists no less than 915 are landowners (or of the family of landowners); the other 930 are cultivators, many having, however, originally been landowners but having lost their rights.

The place was once of more importance than it is now, and the non-agricultural population was then larger than now.

The following list shows the detail of the 495 persons now resident:—

The Shaikhs and Chamars depend on day-labour for their livelihood; the bakkals are the same as banias. They are, as a rule, well off and lend money; but two women, whose husbands are dead, have to do spinning and other work for wages.

The subjoined statement shows the number in detail of non-cultivators residing in Dhabharsi:—

No.	Caste.	Total.	Males.	Females.	—
1	*Shaikh* - -	11	7	4	Day-labourer
2	*Chamar* - -	12	8	4	Ditto.
3	*Sunar* - -	14	6	8	Goldsmith.
4	*Bakkál* - -	105	54	51	Bania.
5	*Brahman* - -	15	8	7	—
6	*Nai* - - -	6	3	3	Barber.
7	*Bhurji* - -	2	1	1	Grain-parcher
8	*Dhúná* - -	5	1	4	Weaver.
9	*Kumeár* - -	6	4	2	Potter.
10	*Kaith* - -	27	12	15	Writers, &c. patwarís, and kanúngos.
11	*Teli* - - -	5	3	2	Oilman.
12	*Jotshi* - -	6	2	4	Astrologer.
13	*Fakir* - -	2	1	1	Beggar.

The jotshís above mentioned are supposed to be able to predict the fortunate moment for commencing different kinds of work, and auspicious days for marriages, &c. They have now, however, descended to very near the level of common beggars.

As a rule, the people of this village are rather badly off; the soil is exceedingly poor, mere sand in many places, and their numbers are too large for the village. Only the banias seem really to flourish, with one or two of the most pushing of the sharers.

The following is an account of an ordinary day's work done by a cultivator:—

His name is Sewai Singh. He is a Taga of the same family as the zamindars, but not a sharer. He has a son, Khana, nearly grown up, and a wife.

He holds in Dhabharsi 24 bighas (about three and two-thirds of an acre), and also 68 bighas 9 biswas (about ten and a half acres) in Jatpura, a village close by. His rent in Dhabharsi is cash Rs. 6 12 annas, and in Jatpura batai, *i.e.*, division of crops.

The value of what he gets from the land of course varies a good deal from year to year, but last year (rather a bad year on the whole) was, deducting his rent, which is one-third of the produce in Jatpura, Rs. 111 14a.

His expenses were:—

	Rs. a.		Rs. a.
Food for self and son - -	40 14	each,	81 12
For wife - - -	36 4	„	36 4
Total - -			118 0
Cloth for self -	7 0		
„ for son -	5 8		
„ for wife -	9 0		
Total -	21 8		

His expenses were thus Rs. 139 8a., or Rs. 27 10a. over his income. This amount he borrowed without any deed being written at 24 per cent. He has not yet repaid it.

On the day taken as an example he got up at 6 (it was about the 18th January), and made a rope for his well out of munj fibre (munj is the top of the tall strong grass which grows freely on this sandy soil).

This took him till about 12, working easily. He then took his first meal, which consisted of half a seer of makka made into cakes and two chittaks of dál. After this he rested for about an hour, and then took out his cattle to graze and drink. He brought them in about 4.30 p.m. and shut them up, supplying them with bhusa. After this he went out to see his rabi fields, and to have a talk with some neighbours. He returned home about 7, and his wife then prepared his supper, which was very nearly the same as his lunch, except that he took ghi instead of dál. He went to sleep in his house at 9; he very seldom sleeps out at his fields till the rabi is ready for cutting.

His son was away on the day described.

His clothes are as follows:—

1. Cold weather (morning).		1. A dhoti of thick cloth. 2. A mirzai or jacket of cloth. 3. A chádar or sheet of rather thinner material. 4. A kámal.
	Midday.	Dhoti, mirzai, and a small pagri of cloth.
	Evening.	Same as morning, with pagri.
	Night.	Same as morning, except mirzai, and in addition a warm coverlet padded, and cotton wool.

The value of these is as follows:—

	Rs. a.	
Dhotis, two required, value -	1 8.	Lasts a year.
Mirzai, one „ „ -	0 9.	Lasts 6 months.
Chadar, one „ „ -	0 10.	Lasts 9 months.
Kámal, one „ „ -	1 8.	About 18 months.
Pagri, one „ „ -	0 6.	About 6 months.
Razai, one „ „ -	1 12.	About 2 years.

2. Hot weather same as in cold, except kámal and razai.

Mirzai is also made of thinner cloth; costs rather more—about 12 annas instead of nine annas.

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His wife wears the same clothes day and night; they cost more than his do, because they are dyed, and this requires to be done about every six mouths for those which are in constant use. She has a special set which she only wears on fair days, or other special occasions.

She fetches water from the well, cooks, takes care of the house, and takes out her husband's dinner when he is in the fields. She does not work in the fields herself, but she makes cakes of cowdung for fuel in the yard outside the house.

The following example of a day-labourer's life is from the same village :—

Karim Bakhsh, Shaikh, aged 43, has a wife and two sons—one grown up, the other about 12.

The elder son earns his own living, and is separate from the family; the younger lives with his father, and does what work he can to earn his bread. The expenses of the three—father, mother, and son—come to—

	Rs.	a.
Food :		
Father - - - -	21	8
Mother - - -	16	14
Son - - - -	12	8
Total - -	50	14

	Rs.	a.
Cloth :		
Father - - - -	2	8
Mother - - -	3	0
Son - - - -	1	8
Total - -	7	0
Altogether - - - -	57	14

On the day selected (about 18th January), Karim Bakhsh and his son went out about 7.30 a.m., and weeded a field of one of the zamindars till 12; the field being near the villaga they returned home for dinner, and got between them 14 chittaks of bajra cake (*i.e.*, rough cakes made of barley and gram); they returned to work at about 1, and weeded till 5; they got paid for this two annas between them, and with this bought some bajra and salt; they got about two seers of bajra and a small piece of salt. For supper they took the same as for dinner, using part of the salt, and putting away the rest of the salt and all the bajra for another day. They went to sleep about 8.30.

Karim Bakhsh has a dhoti (only one) worth about 10 annas, a mirzai worth eight annas, a chadár worth nine annas, and a thick kámal which cost Re. 1 6a.

His son has a dhoti and a mirzai and chadár, but no kámal.

The clothes are made to last about a year, and the kámal about two years.

Karim Bakhsh's wife looks after the house and cooks the food, and also earns something by cleaning cotton and spinning.

Mr. Stack.

Bareilly.

The following are the results of inquiries of my own in four selected villages:—

No. 1.—A family of old hereditary cultivators, consisting of 5 men, 7 women, and 10 children.

Area of land held 294–4–0 village bíghas or 73–11–0 Government bíghas, or 46 acres.

Food grains raised in 1284 fasli - 191

Value of other produce:—

	Rs.	a.	p.
Cane - - -	203	1	6
Chari - - -	3	8	0
Cotton - - -	12	8	0
Value of crops not food grains -	219	1	6
Add net profits of a small zemindari holding (bíghas 5–1–8) in two small pattis -	44	0	6
Total income 191 maunds of food grain and - -	263	1	6

and taking the consumption of the family as 134 maunds of farinaceous and 18 maunds of leguminous grain a year (an independent calculation which corresponds very nearly with the municipal average of 7 maunds per head per annum), there remain 39 maunds of grain and Rs. 263–1–6.

The other expenses of the family are as follows:—

	Rs.	a.	p.
Rent - - - -	120	3	3
Hired labour in weeding -	20	10	0
Ditto reaping -	11	4	0
Ditto watering cane -	20	14	8
Ditto crushing „ -	41	4	6
(The rates of labour have been taken from Mr. Moens' settlement report.)			
Salt - - - -	12	0	0
Pepper - - - -	5	0	0
Tobacco - - -	12	8	0
Clothes - - -	44	0	0
Herd boy (at an average of Rs. 2 a month) - - -	24	0	0
Total expenses -	311	12	3

Estimating the 39 maunds of surplus grain as worth Rs. 78, the net profits of the year will be Rs. 26–5–3; against this there have to be set extraordinary expenses, estimated as follows, within the last fifteen years:—

	Rs.
Six marriages - - -	700
Five funerals - - -	130

The family are deeply in debt. One baniya has obtained a decree against them (April 1877) for Rs. 3,251–7–0, being the accumulated debt on account of Rs. 2,600 borrowed at 24 per cent. some eight years previously. This is to be paid off in yearly instalments of Rs. 500, and the first instalment has actually been paid with interest, leaving Rs. 2,751–7–0 due. In September 1876, Rs. 200 were borrowed from another baniya. Since then money has been borrowed as follows:—

21st July, 1877,	Rs. 1,800 on mortgage of 64 bíghas grove.
8th Dec. 1877,	„ 1,000 on cane of all borrower's tenants.
29th Aug. 1878,	„ 550 on mortgage of zemindari.
Various small sums,	„ 207–5–0.

The Rs. 1,800 were partly spent in seed grain, partly in buying bighas 3–1–8 in another patti. Of the Rs. 1,000, Rs. 374–13–6 went to pay off an old debt, Rs. 361 in seed grain, and Rs. 264 in the November and December kists of revenue.

The Rs. 550 were used to pay the instalment of old debt noted above.

Total debt, Rs. 3,557–5–0, principal + 2,951–7–0, = 6,508–12–0, besides Rs. 100 interest.

The family used to keep two sugar boiling houses; for the last two years only one has been going. Failure of the harvest in 1868–69 and 1873–74, and again in 1877–78, is alleged as the cause of debt.

The house consists of two separate premises with a narrow lane between. The men's quarters contain four ceiled rooms, the women's six. There are also six thatched sheds.

All the walls are of mud. Counting the cost of each shed as Rs. 7, that of each ceiled room at Rs. 25, and that of the inclosure walls as Rs. 10 each, the value of the entire premises will be Rs. 312.

The family possess 15 bullocks, 7 cows, 5 calves, and 3 buffaloes (one female), also one plough. They have two carts and one light bullock waggon. The women's jewels are not valued at more than Rs. 10. There is no store of grain. After paying the interest on their debts the family have no surplus income.

No. 2.—The family consists of a man and his wife and three children, the eldest aged seven. They hold bighas 63–2–0.

Food grains of 1284 fasli -	54 mds.
Value of other crops (cotton)	Rs. 7–13

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The consumption of the family estimated at 2½ seers of farinaceous and ¼ seer of leguminous grain per diem is maunds 26–12 a year, leaving 27–8 + Rs. 7–13–0.

The other expenses are as follows :—

	Rs.	a.	p.
Weeding - - -	5	12	8
Reaping - - -	3	10	0
Salt - - -	2	4	0
Pepper - - -	1	8	0
Tobacco - - -	2	13	0
Clothes - - -	6	0	0
Total -	21	15	8
Rent - - -	24	3	0
Total charges -	46	2	8

Counting the 27–8 surplus maunds of grain as worth Rs. 54–6–0, the yearly net profit will be Rs. 8–3–4 + Rs. 7–13–0 = Rs. 16–0–4.

The cultivator has no occupancy rights. He has had no marriage or funeral expenses to pay, his own marriage having been paid for by his father, and his father's funeral expenses having been defrayed by his uncle. But he got into debt over the failure of his cane in 1874, and at present he owes Rs. 25 to one baniya and Rs. 150 to another. The interest on these debts leaves him no surplus income.

The house consists of two thatched rooms with an enclosure wall. The cultivator had two bullocks, which have died. He has two mattocks, worth one rupee each. His wife's jewels were pawned last year for Rs. 12. He has no store of grain.

No. 3.—This family consists of five men, four women, and six children (one a boy of 15, the rest from seven years downwards).

They hold bighas 123–16–0, and the produce of 1284 fasli is estimated as follows :—

Food grains - - - 102 maunds.

Value of other crops—

	Rs.	a.	p.
Cane - - -	231	0	0
Chari - - -	7	8	0
Flax - - -	15	8	0
Total -	254	0	0

Taking the average consumption as 10 seers a day of farinaceous and one seer of leguminous grain, the annual consumption will be 100 maunds for the whole family.

The other expenses are as follows :—

	Rs.	a.	p.
Weeding - - -	21	4	0
Reaping - - -	12	0	0
Watering cane - -	19	2	2
Crushing cane - -	38	4	9
Salt - - -	7	0	0
Pepper - - -	3	12	0
Tobacco - - -	12	8	0
Clothes - - -	19	0	0
Total -	132	14	11
Rent - - -	104	8	0
Total expenses -	237	6	11

Deducting the consumption and expenses, there remain 2 maunds + Rs. 16–9–1; or reckoning the grain at Rs. 4, the net annual profit is Rs. 20–9–1.

Nevertheless, the cultivator is in debt to the extent of Rs. 100, caused by the failure of last year's cane. His creditor as usual is the sugar boiler. He has always been in debt to him off and on, according to the seasons.

There are eight rooms in the house, four cattle sheds, two bhusa sheds, and one small sitting room. All the walls are of mud and the roofs of thatch. The whole premises would cost about Rs. 110 if new.

The cultivator owns six bullocks, two cows, one calf, one he-goat, and one she-goat. He has about four maunds of kharif grain in store. He pawned his cooking pots for Rs. 12, and his women's jewels for Rs. 20.

There have been three marriages within the last ten years, costing on an average Rs. 15 each.

No. 4.—This family consists of two men, two women, and two children (aged 10 and 5).

They hold bighas 24–16–0 (village). The food grains of 1284 fasli on this land were 32 maunds.

	Rs.	a.	p.
Value of cane - - -	42	0	0
„ of vegetables - -	15	0	0
„ of cotton - -	2	7	0
„ of flax - - -	1	9	3

Estimating the consumption of the family at 3½ seers of farinaceous and ½ seer of leguminous grain a day, the total annual consumption will be 36½ maunds a year.

The other expenses are :—

	Rs.	a.	p.
Rent - - -	32	8	0
Salt - - -	2	8	0
Tobacco - - -	5	8	0
Clothes - - -	8	0	0
Total 36½ maunds grain + Rs.	48	8	0

Or taking the deficit of 4½ maunds as equivalent to a debt of Rs. 9, the expenses, other than mere food, will be Rs. 57–8–0 against an income of Rs. 61–0–3, leaving a surplus of Rs. 3–8–3 a year. The cultivator owns two bullocks; he lives in a mud house with three thatched rooms, two of which are roofless; and he is in debt to several petty local baniyas; but he professes ignorance of the total amount of his liabilities, which have been going on now for eight or ten years. His daughter's marriage about four years ago, cost Rs. 5; it was by "dola." His wife has no ornaments. The debts leave him no surplus income, nor has he any store of grain.

No. 5.—This family consists of 4 men, 5 women, and 11 children (two of 15, one of 12 years, and the rest from 10 downwards).

They hold village bighas 185–4–0, and the out-turn of food grains on this in 1284 fasli was 241 maunds.

	Rs.	a.	p.
Value of cane - -	319	12	0
Do. of cotton - -	1	0	0
Do. of chari - -	38	14	9
Do. of flax - -	3	2	3
Total - -	362	13	0

Taking the consumption of the family at 122 maunds a year, we have for other expenses :—

	Rs.	a.	p.
Weeding - - -	35	0	0
Reaping - - -	28	0	0
Watering cane - -	43	12	0
Crushing „ - -	87	8	0
Salt - - -	9	8	0
Pepper - - -	5	0	0
Tobacco - - -	11	0	0
Clothes - - -	42	0	0
Servant - - -	24	0	0
Oil (2 chittacks a day at 3 seers per rupee) - -	15	0	0
Meat (every 3rd day 4 annas worth) - -	30	0	0
	330	12	0
Rent - - -	69	2	9
Total - -	399	14	9

To meet this expenditure there are Rs. 362–13–0 + Rs. 238, the value of the 119 surplus maunds of grain; total Rs. 600–13–0.

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This leaves a net profit of Rs. 200 a year.

The reason of this large profit is that the greater part of the land held is khudkasht zemindari. Besides the above profits from cultivation, the profits from rents in the 12½ biswanchas in question are Rs. 61–13–9 for this family, making the entire yearly profit Rs. 307–13–9.

The house has four dwelling-rooms, three small cook-houses, four large byres, and a covered doorway, all of mud with thatched roofs.

The cattle are eight bullocks, one cow, one calf, one she-goat.

There is one light cart for field work.

Grain enough was saved from the rabi to last the family till the kharíf harvest; there is no further store.

The women have a very small amount of jewels, valued at Rs. 5.

The family are indebted: Rs. 500 to one money-lender, Rs. 600 to another, and Rs. 225 to a third. These are all old standing debts. The interest at 24 per cent. would be Rs. 318 a year. The cause of debt was bad seasons, and marriages helped them. In the last six years there have been three marriages, costing Rs. 430, and one funeral, costing Rs. 60. The interest of the debts leaves no surplus income.

No. 6.—This family consists of a man and his wife and four sons (one aged 12, the rest from eight years downwards).

They have a one-third share in bíghas 12–4–0 by occupancy tenure, besides bíghas 8–4–0 by non-occupancy tenure. The out-turn of food grains in 1284 fasli was maunds 23–12.

	Rs.	a.	p.
Value of cane	30	0	0
Do. of cotton	2	12	0
Do. of chari	2	12	9

Estimating the consumption of the family as that of three and a half full-grown men, or 25 maunds a year, the remaining expenses may be put down as follows:—

	Rs.	a.	p.
Watering cane	2	8	3
Crushing „	5	0	0
Salt	1	12	0
Pepper	0	12	0
Clothes	5	0	0
Rent	13	8	0
Total	28	8	3

This leaves a cash surplus of Rs. 6–0–6, out of which Rs. 2–8–0 have to be deducted on account of the deficiency in grain, leaving a net annual surplus of Rs. 3–8–6. These profits have to be divided with the cultivator's two brothers, who live apart and support themselves by labour. The house consists of one thatched room. All the household property—it was only a lotah and a brass dish—has been sold; there remain a huqqa and some earthen pots. The cultivator has two bullocks and a she-goat. His wife has no ornaments. His children have no clothes. They have no store of grain.

The family are always more or less in debt on account of the expenses connected with cane cultivation. The present debt is Rs. 16, borrowed last year at 24 per cent. The interest on this swallows up the annual surplus.

No. 7.—This family consists of a man, his wife and mother, and one child 2 years old. He owns a small zemindari, from which he got in 1284 Fasli, with the produce of a grove, temple, and fishery dues, Rs. 135–9–11, paying Rs. 55–14–3 revenue and cesses. Besides this, cultivated bíghas 99–16–0 of sír land, the out-turn on which was as follows:—

	Mds.	s.	c.
Food grains	89	20	0
	Rs.	**a.**	**p.**
Value of cane	409	10	0
Do. of flax seed	16	0	0

There is a herd-boy who gets his board and lodging, and there are two servants, who get part board. Taking the consumption of the family as equivalent to four full grown men, *i.e.*, 35 maunds a year, the other expenses may be reckoned as follows:—

	Rs.	a.	p.
Weeding	12	6	5
Harvesting	12	0	0
Cane seed at Re. 1 the village bígha	29	3	0
Watering cane	38	15	3
Crushing	77	15	0
Salt	2	8	0
Pepper	1	8	0
Tobacco	2	13	0
Clothes	8	0	0
Servant's wages	63	0	0
Total	247	4	8

The land being all sír, the nominal rent has been allowed for in calculating the profits on the zemindari. Thus, the annual surplus is Rs. 178–5–4 + 54½ maunds of grain, or approximately Rs. 287 altogether.

The premises consist of two distinct enclosures with a lane between them. One consists of a courtyard and a byre, and one room for the cow-keeper in the doorway. The other has three ceiled rooms, one of which contains bhusa, one is occupied as a dwelling-house, and one is empty. The enclosure of the cattle-yard is ruinous. All the walls are mud.

Besides the bhusa (about 400 cubic feet), there are about 10 maunds of grain in store. The women have holiday clothes worth some Rs. 20, and jewels estimated at Rs. 15. There are brass cooking utensils in the house. The cattle are four bullocks and one buffalo-cow. There is one light bullock waggon.

The marriage of the head of the family, four years ago, cost Rs. 150.

In spite of the large apparent profit, the cultivator has been in debt for the last six years. Two years and a half ago a decree for Rs. 150 was obtained against him, and to pay off this and also a debt to another baniya he borrowed Rs. 700 in May 1876, at 24 per cent., mortgaging his zemindari. He was already in debt to this man in Rs. 100, borrowed eight months previously. Hitherto this latter sum has been paid by placing the lender in possession of a ten-bígha field for the last two years. On the Rs. 700 no interest has been paid yet. The sum due is now nearly Rs. 1,000, and the interest on it would absorb nearly all the annual surplus income. Cause of debt, bad seasons.

No. 8.—This family consists of a man and his wife, three sons (12 to 5 years), and one daughter of 15, married, but not gone home to her husband. They have a one-fourth share in 13¼ biswanchas, bringing in Rs. 15–13–4 as profits in 1284 fasli. They have also a one-fourth share in bíghas 192–8–0 sír land, besides bíghas 27, rented at Rs. 14–10–3. The outturn on this land belonging to the family in 1284 fasli was as follows—

	Mds.	s.	c.
Food grains	81	11	4
	Rs.	**a.**	**p.**
Value of chari	11	5	0
Do. of cane	67	8	0
Do. of flax	13	0	0
Do. of cotton	6	0	0

Counting the part board of two servants, the consumption of the family may be estimated at 45 maunds a year. The other expenses are as follows:—

	Rs.	a.	p.
Weeding	3	13	0
Harvesting	9	10	0
Watering cane	5	7	6
Crushing „	10	11	0
Salt	3	0	0
Pepper	2	0	0
Clothes	15	0	0

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	Rs. a. p.
Servants' wages - -	60 0 0
Tobacco - - -	3 8 0
Rent - - -	14 10 3
Total - -	127 11 9

Against this there is a cash income of Rs. 27–13–0 +36½ surplus maunds of grain, so that the net annual surplus will be Rs. 40–1–3.

The house consists of three ceiled rooms with a thatched verandah (one of the rooms is in the doorway), and one byre; all the walls are mud. One of the rooms is the dwelling-house. About 15 maunds of grain are in store from the rabi harvest.

The cattle are 3 bullocks, 7 cows, 4 heifers, 6 sheep.

The women are utterly destitute of jewellery.

The family have been in debt since before the mutiny.

The daughter's marriage the year before last cost Rs. 250. Rs. 100 were borrowed last year, and Rs. 400 were owed before that. The interest on this at 24 per cent. would swallow up the annual surplus.

Mr. Staley.

Etawah.

All persons acquainted with the district agree that the economical condition of the cultivators is on the whole good; that the industrious and frugal can rise to comparative wealth.

Exemplar No. 1.—Karagjit, son of Kesrí Chamar, of Narauli, holds 22 bíghas 5 biswas pucka (about 12½ acres) of land at a rent of Rs. 53 8 0. In his house live his two sons, two grandsons, wife, two daughters-in-law, and daughter. His holding is divided as follows :—

Crop produced.	Area.	Average Amount of Produce.	Value of produce in ordinary years when good rain falls.	
	B. bis.	Mds. s.	Rs. a.	
Juar - - - -	5 0	22 20	30 0	(at 30 seers the rupee).
Bajra - - -	6 6	30 0	40 0	(Ditto).
Cotton - - - -	2 10	5 5	33 12	(at 7 seers the rupee).
Til, tilí - - - -	—	1 10	3 12	
Urd and mung - -	—	2 20	6 4	
Wheat - - - -	1 15	12 30	25 0	(at 20 seers the rupee).
Bejhar - - - -	5 0	30 0	40 0	(at 30 seers per rupee).
Chana - - - -	1 10	5 10	7 14	
Sarson - - - -	—	1 0	3 0	
Arhar - - - -	—	10 0	10 0	
Carrots - - - -	0 4	50 0	10 0	
	22 5	170 45	209 10	

Expenses for ploughing, weeding, watering, the cultivator reckons at Rs. 32 per year. Expenditure for necessaries not produced on the holding he reckons at Rs. 30 a year for clothes, Rs. 4 for gur, Rs. 4 for condiments, Rs. 6 for salt for the whole family. His house is built of mud, contains three rooms, a room just inside the doorway, called a barota, and a thatched shed. Has one separate shed for his cattle, ploughs, with an ox and buffalo bull; he has no other cattle except one buffalo calf (male). He states he has no store of grain and saves nothing. Only owes Rs. 40 which was advanced to him for seed: but his fields having been dried up, he was unable to repay it. Is unable to account, or will not account, for the surplus which remains, after paying his rent and after (other necessary expenditure, of his profits from his crops. His possessions consist of two brass dishes (thális), one brass vessel called a bela, two called lotahs, one iron pan called a karáhi, one called a tawah, one called a karchi, one pipkin called a kunra, eight charpais, ornaments, four pairs brass amouts, one seer weight of brass karras. Besides this he has six baskets, two handmills, two sieves, one plough, one well-rope, one water-skin, one phaora, one kudari, three khurpis, two hansias, two garasis.

Exemplar No. 2.—Sukhi, son of Dya Ram Lodhi, of Lodhpura, Muhabbatpur, cultivates 8 bíghas 6 biswas at a rent of Rs. 53. Three sons, one brother-in-law, one wife, one sister-in-law, one daughter-in-law live with him. His holding is divided as follows :—

Name of Crop.	Area.	Amount of Produce.	Value in Money.
	B. bis.	Mds. s.	Rs. a. p.
Juar - - -	1 0	3 30	5 0 0
Cotton - - -	0 15	1 0	4 0 0
Sugarcane - -	0 15	5 0	20 0 0
Maize - - -	0 5	1 10	1 4 0
Wheat - - -	3 6	20 0	40 0 3
Bejhar - - -	1 15	12 20	16 10 0
Opium - - -	0 15	0 6	24 0 0
Poppy-seed - -	—	2 20	5 0 0
Indigo - - -	2 9	150 6	25 0 0
Sarson - - -	—	0 2½	0 3 0
Carrots - - -	0 1	10 0	2 0 0
Total - -	11 0	—	143 1 0

i.e. of the 8 bighas 6 biswas holding, 2 bighas 14 biswas are double-cropped.

He reckons his expenditure in wages at Rs. 20, in clothes at Rs. 20, salt Rs. 5, condiments Re. 1, oil Rs. 3, dál Rs. 3; total Rs. 42.

His house is mud, containing two rooms and one shed and a cattle shed. Of cattle he has one ox, one buffalo bull, and one buffalo calf. He states he has saved no grain; that he owes Rs: 25, which he borrowed when the rain failed last year. Also states that he saves nothing, and ekes out a livelihood by odd jobs of field work. He owns two thális of brass, two belas, three lotahs, one karáhi, one tawah, one karchi, one wooden trough for pounding grain, six charpais, four baskets, one stone hand-mill, one plough, two baskets for lifting water, one phanra, four khurpis, two hansias, one garasi.

Exemplar No. 3—Kanhai, son of Khaggi Kachi, of Sultanpur kalan, holds 19 bighas 13 biswas at a rent of Rs. 58 8 0. With him live one son, one mother, one wife, one sister-in-law. His holding is divided as follows :—

Name of crop.	Area.	Amount of Produce.	Value in Money.
	B. bis.	Mds. s.	Rs. a. p.
Juár - - -	3 15	18 30	25 0 0
Bajra - - -	1 15	9 15	12 8 0
Cotton - - -	2 15	9 30	48 12 0
Mukka - - -	1 10	6 10	6 4 0
Til tili - - -	—	1 10	3 12 0
Marua - - -	10 0	1 20	1 8 0
Urd and múng - -	—	2 20	6 4 0
Rausa - - -	—	2 0	4 0 0
Wheat - - -	2 15	15 0	30 0 0
Bejhar - - -	5 15	30 0	40 0 0
Sarson - - -	—	2 0	6 0 0
Sehuan - - -	—	0 10	0 8 0
Alsi - - -	—	1 0	3 0 0
Carrots - - -	0 3	50 0	10 0 0
Muli - - -	0 3	30 0	8 0 0
Egg-plant - -	0 9	24 0	12 0 0
Arhar (under-cotton) -	—	12 0	20 0 0
Chana - - -	2 3	8 0	12 0 0
Total - -	21 13	—	249 8 0

Of these 21 bíghas 13 bíswas 20 bíghas are twice-cropped. He reckons expenditure on wages at Rs. 40,

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Etawah.

on salt Rs. 6, gur Rs. 6, condiments Rs. 3, clothes Rs. 20 ; total Rs. 75. His house is of mud, and contains two rooms, one thatched shed, one entrance room called barota; the cattle live in one of the rooms of the house. He has two oxen, one buffalo cow, one buffalo calf. He states he saves nothing and stores no grains. He owes Rs. 100, which he was obliged to borrow some years ago for seed and household expenses, hail having ruined his crop. His property consists of two thális, two belas of brass, one karchi of iron, one iron tawah, one spoon, one karchuli, one brass pot (batua), one small bela, one wooden trough, one belan of wood, five charpais, one pair of silver karras worth Rs. 3, five seers of brass ornaments, three lotahs of brass, five baskets, one stone hand-mill, one sieve, one plough, one well-rope, one water-bag, one phaora, one kudàri, three kurpus, two hansias, one garasi.

Exemplar No. 6.—Debi Kachi, of mauza Mamun, holds 23 bíghas 4 biswas at a rent of Rs. 92, but besides this he pays Rs. 22 for canal irrigation. With him live two sons, two daughters-in-law, three grandsons, three grand-daughters, and one brother. His holding produces $22\frac{1}{2}$ maunds of wheat, 26 maunds of bejhra, 15 maunds of juár, cotton 2 maunds, 3 maunds of bájra, worth Rs. 201 on an average. He pays Rs. 10 for condiments, and, he states, Rs. 20 for wages, but the latter is probably an over-estimate, as his family is so large. His house is of mud with four rooms and one large three-doored room and one barota. His cattle are four oxen, two cows, two goats, which live in his house. He has two thális, four belas, three lotas, one tawah, one karchi, one karáhi, one spoon, one hand-mill, nine beds, one phaora, furniture. His cattle live in his house. He states he saves nothing, but is not in debt; that he was lately, but has now paid it off.

Exemplar No. 8.— Gauri Shankar Brahman, of Lachiamán, has a holding of 26 bíghas 4 biswas at a rent of Rs. 69–5–0; but besides this he holds 2 bíghas 9 biswas as a sub-tenant at a rent of Rs. 10–8–0. Of this land he keeps generally one bígha or so grass for his cattle. With him live his father and mother and a wife and brother and sister-in-law and a daughter. He grows about 100 maunds of grain, Rs. 10 or 12 worth of cotton, and the like of sugarcane, worth in all Rs. 220 or 230. Besides his family he keeps two servants, which cost him about Rs. 36. In miscellaneous expenses he spends Rs. 10. His house is of mud with four rooms, the cattle living in the house. He has five oxen, one buffalo cow, one buffalo cow calf, and one mare and one foal, and one cow and a bull calf. He has the same furniture as the exemplar already stated. He has 10 or 12 maunds of grain stored. He owes nothing whatever.

Mr. Wright.

Cawnpore.

Daily Life and Circumstances of four Cultivators in a village of Cawnpore.

Example 1.—Maikua, a Káchi, cultivates seven acres and pays a rent of Rs. 50. He is only a sub-tenant, and has no occupancy rights, having lost the land which he had some years ago. He has a wife, a boy aged 10 years (Babbua), another $1\frac{1}{2}$ years, an infant son, and a daughter aged six years, also a nephew (Madári) aged 12.

Food.—From June to September he lived on the bejhra (mixed barley and peas) remaining from his last year's spring harvest. From September he began to live on his kákun (millet, Panicum Italicum) till the middle of October, when he began to pull the ears of joár (large millet, Holcus sorghum); this lasted for a month, when the joár was ripe; and he intended to live on that till the spring harvest. Every day 6 lbs. grain are cooked for the family, of which Maikua eats 2 lbs., his wife $1\frac{1}{2}$ lbs., and the children between them $2\frac{1}{2}$ lbs. He always eats salt and arhar dál (Cytisus cajan), if he can get it, but it has been so dear that he has not eaten any since last June. Instead he eats greens, the ordinary sag (potherb) or bathui (Chenopodium album), which grows wild in the fields, or mustard leaves and stalks, whatever is in season. His baígans (Salanum melongena) were bitten by frost.

Clothing.—Every year Maikua buys himself a pair of dhotis (waist cloth) costing Re. 1 8 or 3*s.*, an angochha (headcloth or pagri) costing $1\frac{1}{2}$ annas or 2*d.*, and a pichhora (wrap) costing 9*d.* (6 annas). His wife has a petticoat (lehnga) costing 2*s.* (Re. 1) and a shawl (lugra) costing 9*d.* (6 annas). The eldest boy has a wrap (pichhori, notice the diminutive feminine form of the word) worth 6*d.* (4 annas), a dhoti worth 3*d.* (2 annas), and a little jacket (mirzai) worth 9*d.* (6 annas). The second boy a little coat worth $1\frac{1}{2}$*d.* (1 anna), and the daughter a little petticoat worth $4\frac{1}{2}$*d.* (3 annas), a small shawl worth the same, and a little jacket made up of the old clothing. Last June Maikua bought his wife a petticoat at Lalpur bazár, for which he gave 2*s.* (Re. 1), selling some grain at the same bazár to pay for it.

Jewellery.—His wife has a nose-ring of gold worth 10*s.* (Rs. 5), a broken necklet of silver worth the same, and some pewter rings for ankles, wrists, and toes, worth a rupee at the outside. But she has her little vanity in a box of antimony for the eyes and another of red paint for the part in her hair. The eldest boy has a pair of silver bracelets made for him by his aunt, worth some 4*s.* (Rs. 2) and a pair of anklets worth 18s. (Rs. 9).

Utensils.—A brass lota (drinking or cooking cup) worth 3*s.* (Re. 1 8), a brass dish (thali) worth the same, and a brass pot (batloi), also worth 3*s.*, comprise his plate; an iron pot, spoon, and plate (táwa), on which he bakes his chapattis or unleavened cakes, worth altogether a little more than 4*s.* (Rs. 2), some wooden platters, a kneading trough and rolling pin and stone pickle jar, with some 18*d.* worth of earthen pots, complete his kitchen arrangements, the whole not worth more than one sovereign. A couple of beds made up at home of string made from káns grass (Saccharum spantaneum), a cot for the children, a wooden stool, and a box for his clothes, form his furniture; two pairs of wooden doors, worth 12*s.* (Rs. 6) his personalities.

Plough Cattle.—He has two—one bought last year for 3*l.* 4*s.* (Rs. 32), a five year old; the second, six years old, bought last November for 3*l.* (Rs. 30), when the pair to the first one died. He had to borrow to pay for both at 24 per cent., but has paid off the price of the first one.

Agricultural Operations.—This last year he sowed an acre of cotton which gave him 84 lbs. (uncleaned), for which he got 12*s.*; he also got 80 lbs. of joár from the same field. The arhar (Cytisus cajan) was bitten by the frost. An acre and a half of joár gave him 480 lbs. besides what he ate unripe. He also got 120 lbs. kákun (Panicum Italicum). He has borrowed 240 lbs. of joár to eat, for which he will have to pay in bejhra (mixed barley, gram, and peas) at the rate of 150 per cent. He borrowed 18*s.* to add to what he got for his joár (20*s.*), and his cotton (12*s.*) to pay his half year's instalment of rent, or 2*l.* 10*s.* He borrowed the seed for his spring crops, 100 lbs. of wheat for an acre of land, 180 lbs. bejhra for $2\frac{1}{4}$ acres, and 80 lbs. gojai (mixed wheat and barley) for an acre, which he will have to pay back after harvest at 125 per cent.; besides which he owes still for the price of one bullock.

Account of One Day's Operations.—The incidents of one day at his well were as follows:—About 8 a.m. Madári, the nephew, brought the cattle and about 8 lbs. wheat chaff in a basket, and standing the cattle in the khuriya, or lower part of the run, went to cut some joár. About 8.30 a.m. Maikua came with the yoke and rope, and his little son Babbua brought the bucket; they then made a new lash for the whip, oiled the wheel, fixed it, yoked the bullocks, and started work. Madári, who was at the chulár, or receptacle on which the bucket is emptied, got some of the ripe fruit of the kaukuria (?) and rubbed it on his feet to prevent their cracking when the water was emptied over them. Maikua drove the cattle, Babbua distributed the water in the field. The cattle were watered about 10 a.m. or 11 a.m., when Babbua (whose real name was Gurdyál) pulled and brought some carrots (2 lbs.) to the well, which he and Madári ate. About 1 p.m. Maikua's wife brought a lota (brass cup) of buttermilk which she had begged of a neighbour, and 10 ozs. satu, or the flour of parched barley, and 5 lbs. boiled carrots, which Maikua ate for his dinner, giving a share to the lads. Meanwhile the cattle ate the chaff and some dried (by frost) arhar leaves mixed with it. Maikua then had a smoke and started work again. This time Maikua emptied the bucket, and Madári drove the cattle. Work was knocked off about 6 p.m.

The well was an earthen one, for one pair of bullocks, dug some 20 years ago, and not cleaned out for the last ten years. It was supplied by filtration, and the sides were held up by kháre (arhar stalks). The depth to water taken at morning was $3\frac{1}{15}$ feet, at evening $7\frac{5}{7}$ feet. The water was taken 250 feet to the field. In one hour (11.20 a.m. to 12.20 p.m.) 43 buckets were counted as being lifted; in the day 300 were lifted, watering an area of 4 biswas $11\frac{1}{2}$ biswansis, or rather less than $\frac{1}{8}$th of an acre. In the measured hour 646 square feet were watered, getting $2\frac{2}{5}$ inches of water. The bucket contained 147 pints imperial = 18 gallons 1 quart 1 pint.

Maikua owns a plough, which cost him 1*s.* 9*d.* for what he had to purchase (share 6*d.*, beam 1*s.* 3*d.*); a leather bucket which cost him 6*s.* 6*d.*, and its appurtenances another 2*s.* His rope cost him 3*s.*, pulley 1*s.* 9*d.*

He gives the blacksmiths for repairs 2*s.* a year and 10 lbs. grain off his heap on the threshing-floor, the washer man another 10 lbs., and the barber 1*s.* per annum.

He lives in a house of two rooms with a thatch thrown out in front to keep off the driving rain; his lintels cost him 7*s.*, and the scantlings for his roof 8*s.*

The only festival he can remember of late years was the birth of his firstborn, when he spent 30*s.* in making merry.

Example 2.—My next instance is that of a cultivator fairly well-to-do, and higher in the social scale than Maikua.

Pattu, a Brahman, cultivates 21 acres, paying an annual rent of 10 guineas, with a right of occupancy. His family consists of himself, his brother, three women, a son aged six years and a daughter nine years. He could not say what food he had cooked every day, but he was living on the produce of last spring harvest, from which also he paid his three servants (nominally getting 4*s.* 6*d.* per month each), and hoped to be able to feed them and his family till next spring harvest. He also sowed his fields out of his private grain stores.

Clothing.—The quantity of clothing actually used by Pattu and his family was much the same for each individual as used by Maikua, differing only in quality. But he has a wardrobe of better clothes stored away for festivals, &c. Thus each man has annually his pair of waistcloths costing 4*s.*, his wrap costing 1*s.* 3*d.*, his pagri 9*d.*, and a jacket of dyed cloth worth 2*s.* 3*d.* The married women have their petticoats worth 3*s.* each, shawls worth 4*s.* each. The widow only has a pair of dhotis, which she wears like a sári, costing 4*s.* But in addition to the above there are a pair of sheets of country cloth (4*s.*), a pair of common wraps (2*s.*), a waistcloth of American drill (1*s.* 6*d.*), a pair of best waistcloths for visits, &c. (5*s.*), a good double wrap (4*s.*), a jean jacket (1*s.* 6*d.*), two good shawls of jean (3*s.*), a pair of turkey red petticoats (10*s.*), a purple sári of silk (5*s.*), a chintz shawl (4*s.*), and a cloth wrap worth 12*s.*, bought by the brother when he was in the army. They have also a pair of quilts (18*s.*) and a mattress (10*s.*). Of his last crop of cotton Pattu has made six pairs of waistcloths (dhotis), of which two pairs will go to the men for daily wear, and from the remainder three wraps will be made. As a rule Pattu and his family never wear English cloth.

Jewellery.—The widowed mother has about 16*s.* worth of silver bangles on her arms. As a Brahman widow she discards at the funeral ceremonies all but these ornaments, and for the future wears neither nose-ring nor foot ornaments. The married women have each about 2*l.* worth of silver ornaments and a gold nose-ring worth 1*l.* But for common wear 2*s* worth of pewter ornaments are enough. The boy has bracelets and anklets worth 1*l.* Most of these ornaments were made out of the profits of ghi, made and sold by the women, of which they sell about 4*s.* worth per month, and from it also buy extra food for the milch cattle, and condiments and spices for domestic use.

Utensils.—Here, too, Pattu is well off.

	Value. *s.*	*d.*
2 large dishes of bell-metal (being a Brahman he does not use brass)	8	9
1 very large dish of brass for festivals	8	0
3 bell-metal saucers	7	0
1 brass saucer	1	6
2 little brass saucers	1	0
1 large brass vessel	4	6
1 still larger vessel (párât)	8	0
2 spoons of brass	1	3
2 brass cups (lotah)	4	3
1 cup of bell-metal	5	0
1 brass cup (abkhora)	1	0
1 very large brass vessel (kalsa)	10	0
2 iron cauldrons and two iron spoons	8	0
1 iron bucket	2	3
A wooden kneading trough and stone rolling board and a wooden roller	1	4
Two stone jars for pickles, buttermilk, &c.	8	6

and about 18 earthen pots of sizes, or about 8*l.* worth of kitchen utensils, to which should be added a pair of millstones for grain, and a smaller pair for splitting pulses, and a cotton gin anp spinning wheel used by the women folks.

Agricultural Stock.—Pattu has two pairs of oxen: one pair he bought five years ago for 7*l.* 4*s.*; another pair he bought 10 years ago for 4*l.* 18*s.*, of which one died and was replaced by a home-born calf. Before the mutiny he had a cow buffalo worth 1*l.* 17*s.*, and bought a second two years after for 1*l.* 12*s.*, from which he has had two calves, which now give milk, having sold the old ones for 2*l.* 16*s.* Last year his father-in-law gave him a cow and a heifer; the cow ran off, but the latter one gives milk regularly. He has two ploughs which cost 5*s.* each, two yokes costing 1*s.* each, a clod-crusher, 4*s.*; a spade, 2*s.* 3*d.*; two hoes, 9*d.*; three sickles, 11*d.*; two choppers, 2*s.*; an axe, 6*d.*; two leather buckets for the well costing 10*s.*; a couple of ropes, 8*s.*; and a cart which cost him 3*l.*; bullocks' clothing, 2*s.*; and a piece of sacking to hold the grain in the cart worth 10*s.*

Agricultural Operations.—Pattu does not put hand to the plough himself, so keeps three ploughmen at 4*s.* 6*d.* each per month. This year he has put in $5\frac{3}{4}$ acres of joár and $4\frac{1}{2}$ acres cotton. The former gave him 2,952 lbs. grain and 276 lbs. sesamum seed. There was no undergrowth of pulses, and his arhar was destroyed by frost. From the cotton he only got 94 lbs. of clean cotton. Eleven acres he has put down in wheat and bejhra, which he is now watering. There is enough and to spare of fodder still standing in the fields, and plenty of grain in pits for consumption till the next harvest.

Incidents at the Well.—Pattu's well was dug 32 years ago, and is cleaned out and kept up with new binders every third year: it cost originally only 1*l.* 10*s.* to make. As is a common custom, the well

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was being worked turn-and-about by Pattu and another cultivator called Rája, each helping the other with their cattle and gear. This plan is called sámpar or jíta, and accounts for the very small cash expenditure which is demanded from the cultivators. About 10 a.m. Pattu brought the well gear in a cart, two of his bullocks dragging it, two following it; he took the gear of one bucket to another well belonging to a friend, with whom also he had a jíta arrangement. Then Lachhua and Binda, two of the ploughmen, came, and Rája brought in gear and three oxen, one borrowed.

The ploughmen drove the cattle, Rája emptied the buckets. From the first bucket a few drops are sprinkled into the well, and a prayer offered to the local deities for a favourable day's work. About 1 noon Pattu's bucket burst, when Lachhua took Binda's pagri, and stuffed it in the hole. It again burst in another place, when work was stopped for an hour, whilst Lachhua tried to get another bucket, but failing, he took the pagri off a lad standing by and stuffed it in the hole. Rája's father distributed the water in the field. About noon Pattu's brother brought 1½ quarts buttermilk and gave it to the ploughmen; and after this Rája's nephew brought 1½ lbs. joár porridge, which was divided between Rája and his father and Binda. Lachhua's brother then brought two thick unleavened cakes of joár and the leaves of gram as a vegetable cooked with salt. They all ate without stopping the work; the lad whose pagri had been taken helping. Work was knocked off about 6.30 p.m.

Duty.—Owing to the above mischances only $\frac{3}{16}$ths of an acre were irrigated in the day from the three lifts. The water from the two lift well had to travel 823 feet to reach the field to which it was taken, from the single lift well only 120 feet.

Example 3. — Prágdatt is a Brahman cultivator with right of occupancy in 11½ acres, for which he pays an annual rent of Rs. 46, or 4*l.* 12*s.* His family consists of himself, his mother, wife, and infant child.

Food.—During the past year they have lived on the produce of their land, keeping from last harvest 246 lbs. of wheat and 1,230 lbs. of gojai (mixed with wheat and barley). Every day 5 lbs. of flour are cooked for the family, from which one cake (chappatti) is given to the kahárin or water-carrier, and one to the gwála or cowherd who comes to milk the cows. Up to the middle of November the wheat and wheat and barley were eaten, then some joár flour were mixed; and from the autumn harvest 820 lbs. joár and 82 lbs. rice were put by, which will carry on till next spring harvest. With his cakes he eats the pulses of arhar (Cytisus cajan) or urd (Dolichos pilosus), which costs, bought at the nearest bazár, 18*d.* a month. Milk is always going in his house, for he has a cow-buffalo and a goat. Greens as usual (bathui, mustard leaves, and ság).

Clothing.—Prágdatt himself purchases every year a pair of waist cloths value 3*s.*, a common jacket, 1*s.* 6½*d.*; a chintz jacket, 2*s.* 3*d.*; a common wrap (pichhora), 1*s.* 3*d.*; and every other year a thick wrap (dohar), costing 5*s.* His mother gets a pair of waist-cloths every year costing 3*s.* 6*d.*; his wife a petticoat, 2*s.* 6*d.*; a shawl, 3*s.*; a bodice of chintz, 1*s.* 9*d.*; and very other year a pair of shawls, English cloth, costing 5*s.* per pair. She has also a muslin shawl which cost 1*s.* 3*d.*, two best petticoats from Bhágalpur, which she has to keep four years in store before wearing, costing 8*s.*, and a turkey red shawl worth 3*s.* Prágdatt has a jean coat for weddings which cost 1*s.* 3*d.*, and a warm woollen wrap costing 4*s.*, a present from Mathura, given to his mother. Three quilts, 15*s.*; a mattrass, 3*s.*; and a pair of darris (carpets) costing 4*s.*, make up the rest of his household linen, on receiving which he spends about 1*l.* 14*s.* per annum.

Jewellery.—The wife has a nose-ring worth 2*l.*, which was worth only 1*l.* 4*s.* when she bought it with her at her wedding, but which has been enlarged from the sale of some cotton a couple of years ago; also a pair of silver bracelets now, worth 1*l.* 4*s.*; a necklace of whole rupees (hamel) worth 1*l.* 10*s.*, a wedding present; and a pair of armlets worth 16*s.* The mother has a pair of armlets, 16*s.*, a pair of bracelets, 12*s.*, and a solid necklace worth 1*l.* 6*s.* On the child are a pair of bangles worth 16*s.*, given him by his maternal grandfather. For common wear 2*s.* worth of pewter ornaments suffice; as a little money is over, Prágdatt adds it into jewellery.

Utensils :—	*s.*	*d.*
Two large brass vessels - -	10	0
Three lotas (cups), brass - -	7	0
Two brass saucers - - -	5	0
One drinking cup (abkhora) -	1	4½
One brass spoon - - -	0	9
One larger brass platter - -	6	0
Two smaller - - -	2	0
One of bell-metal - - -	5	0
An iron cauldron - - -	6	0
An iron spoon - - -	0	3
An iron bucket - - -	2	0
Odds and ends of stone and wooden utensils - - - -	3	0
Earthen vessels of sizes - -	4	0

But he pays the potter 2*s.* a year for what he wants. A large pair of millstones for flour and a smaller for splitting pulse, a set of weights and scales, three beds and a cot form the sum total of the household furniture.

Agricultural Stock.—A plough which cost 3*s.* 4½*d.*, and of which the share has to be renewed every year; a yoke, 1*s.*; a spade, 3*s.*; four axes at a shilling each; a couple of sickles worth 7*d.*; a leather bucket for the well which cost altogether 8*s.*; a rope, 4*s.*; a pulley, 1*s.* 3*d.*; a clod-crusher, 4*s.*; and a large piece of coarse matting to hold chaff form his dead stock. His live stock consist of a pair of oxen which he bought last year for 10*l.*, part of which he paid from the sale of his old oxen, 6*l.* He bought a cow-buffalo six years ago for 2*l.* 10*s.* (which he had to borrow, but has paid back); this died, but left a calf, which now gives plenty of milk; so that he can sell some 6*s.* worth of ghi in the month. He also has a goat. From June to August the latter were fed on chaff from last spring harvest, then till end of September on the grass from the fields, and till next harvest they will get the millet stalks for fodder.

Agricultural Operations.—Last year Prágdatt had an acre under wheat, an acre and a half under wheat and barley (mixed), and 3⅛ acres under barley and peas (mixed).

From the above he got—

Wheat - - -	984 lbs.
Gojai - - -	1,230 „
Bejhra - - -	2,624 „
Rapeseed - - -	164 „

The bejhra sold for 7*l.* 2*s.* in June, and with the proceeds of that and his old oxen (6*l.*) he paid his half-yearly instalment of rent (2*l.* 6*s.*) and bought a new pair of bullocks. In July he sold the quarter of his wheat for 3*l.*, and the rest he kept for the family. His arrangements for the current year are as follows:—

Kharif—

	Acres.	
Cotton - - -	1	
Joár - - -	3	
„ (closely sown for fodder)	⅞	
Rice - - -	⅞	succeeded by bejhra.

Rabi—

	Acres.
Wheat - - -	1¼
Gojai - - -	1¼
Bejhra - - -	4⅛

The kharif seed he had at home. At a favourable day in Asarh (July) he sowed half an acre of cotton out in the outlands after just one ploughing, and ran over the clod-crusher. In the other half acre which he ploughed twice he had to sow three times. The first sowing did not germinate for want of moisture, the second from excessive rain, so that he had to buy Rs. 11 cotton seed in addition to what he had stored. The cotton was weeded three times; til (Sesamum orientale) was sown here and there; patsan (Hibiscus cannabinus) was sown round the edge and furrows of

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arhar (Cytisus cajan) sown, running east and west about 10 feet apart, so that the sunlight should reach the ripening cotton. Some urd was also sown afterwards when fear of its choking the growing cotton was over, and a row of joár, also sown inside the patsan, round the edge. He sowed 10 lbs. rice, which was weeded three times. Of joár he used 4 lbs. per acre for seed, mixed with $1\frac{1}{2}$ lbs. of arhar, 1 lb. of urd. and 5 oz. of til. Produce of the above was as follows:—

92 lbs. uncleaned cotton (instead of his usual crop of 122 lbs.) but to this should be added the $\frac{1}{11}$th share paid to the pickers. This gave him 30 lbs. cleaned cotton, worth 10*s.* 6*d.*; 60 lbs. cotton seed, worth 2*s.*; 60 lbs. til, worth 7*s.* The hemp, urd, and arhar failed. As he had to pay 12*s.* for rent, 1*s.* 3*d.* for seed, and 5*s.* $2\frac{1}{2}$*d.* for weeding, there was very little profit from the cotton.

1,968 lbs. joár also after deducting the $\frac{1}{11}$th share given to those who cut off the heads, and 40 lbs. til, the whole value 4*l.* 12*s.*, from which he paid 24*s.* rent, 4*s.* 8*d.* for weeding, and 3*s.* for seed, leaving him 3*l.* profit.

1,230 lbs. rice, value 2*l.* 10*s.*, which gave him a profit of 2*l.* after paying for weeding and seed, as the rent would be paid from the rabi harvest.

Prágdatt does not plough himself, but keeps two ploughers at 4*s.* a month and $\frac{1}{2}$ lb. parched gram daily.

Account of One Day's Operation.—Incidents of one day at Prágdatt's were as follows:—

About 8.30 a.m. Prágdatt brought his bucket; Badla Chamar, one of his men, brought the yoke and rope; Pusua, the other labourer, drove the cattle, which he yoked and rigged up the pulley and bucket. Badla stood ready to empty the bucket, whilst Pusua drove and Prágdatt went to the field to distribute the water.

As usual the local deities were worshipped with the contents of the first bucket. After a while Prág came and said he had a pain in his hand and sent Pusua to the field, and Badla to drive, whilst he emptied the buckets. Prág had brought with him 1 lb. of joár grain, which about 9 a.m. he divided between his two labourers. Soon after Pusua's child, a lad of about 9 years came up, and Prág got him to help to distribute the water, with the promise of some buttermilk, whilst Pusua went and cut a load of fodder and took it home to Prág's, after which he came back. About noon an old man sent by Prág's mother came from the village and took the bucket, whilst Prág went home to bathe and eat. His dinner consisted of eight cakes, some pulse, and boiled rice. They sprinkled the bullock-run twice during the day, and a load of the straw was thrown at the bottom of the run for the bullocks to munch as they turned. About 3 p.m. Prág again took the bucket, and Badla went and cut a bundle of green fodder (sehuan and láhi of the mustard class); the day's allowance for the cattle being two bundles of millet stalks cut up in the morning before going to the well, and a bundle of green food mixed with it in the evening, when the cattle feed. Work was knocked off at 6 p.m.

In the day 302 buckets were lifted, each bucket containing $20\frac{1}{4}$ gallons, and less than $\frac{1}{8}$th of an acre was irrigated, (4 biswas 17 biswansis), this being the second watering the field had, and therefore the water going further. In one hour 41 buckets were counted, and the measured area showed a depth of $1\frac{3}{11}$ inch of water given to it.

Example 4.—My last instance is a complete contrast to the foregoing. Kanhaya, potter, is a cultivator of $7\frac{1}{2}$ acres, paying a rent of 4*l.* 16*s.* His family consists of himself, his wife, a grown-up daughter, who comes to live with him at the busy times of weeding, &c., a son 9 years old and a grandson 11 years old. Latterly, too, his brother-in-law has come to live with him and help in the field.

Food.—Six pounds of flour are cooked every day; of this day they eat—the men two cakes at noon, and the women and children one each; in the evening they get their full meal, or about four thick cakes per man, three per woman, and two for the children. Last June they got along by taking the grain from the threshing-floor as it was ready. In July he had to borrow 10*s.* worth, or 180 lbs., bejhra from the banker, eked out with a little gram ground fine and made into porridge. In August he had to borrow another 10*s.* worth, and kept on the porridge with Putulaca derasea growing on his manure heap as a vegetable. In September he cut his sawan (millet, Panicum miliaceum) with the same vegetable or nari (a water plant) from the pond. In October and November he ate his rice, and for vegetables hemp, flowers, and twigs. As his joár ripened he began to pluck and eat it, but had to borrow 358 lbs. joár from the banker, and will have to borrow till his spring harvest is cut, out of which he will try and satisfy banker and landlord. In 1877 he had enough grain in his house to tide him over the drought up till October, and fodder for his cattle, but had to borrow 4*l.* 10*s.* for food and to sink well. So that he owes altogether 4*l.* 10*s.* from last year, and has borrowed 1*l.* 12*s.* worth of food, 1*l.* 12*s.* worth of seed grain, and 6*s.* for clothes, or in all about 8*l.*

Clothes.—Every year Kanhaya has to buy himself a pair of waist-cloths (dhotis) worth 2*s.* 3*d.*, and a pagri worth 6*d.*; and for his wife a petticoat (1*s.* 9*d.*) and shawl 9*d.* Every other year he indulges in a jacket worth 9*d.*; and at longer intervals a thick wrap and a quilt. At present is making shift with a patchwork quilt of old clothes.

Jewellery.—He has no silver jewellery in his house, and only 1*s.* worth of pewter ornaments.

Utensils.—A brass platter worth 1*s.* 9*d.*, a brass cup, 1*s.* 6*d.*, a wooden bowl worth $7\frac{1}{2}$*d.*, and three wooden saucers worth $10\frac{1}{2}$*d.*, a stone jar worth $1\frac{1}{2}$*d.*, and some score earthen pots which he gets for nothing from his relations who carry on the occupation of potter, his three cots, a pair of millstones, a sieve, and scoop form the whole of his domestic furniture.

Agricultural Stock.—Kanhaya has a pair of oxen which he bought with borrowed money—one five years ago for 2*l.* 10*s.*, the other three years ago for 1*l.* 18*s.* Has paid off the loan. Lost his cow last year; has a bull calf alive. Has a plough which cost him six years ago 1*l.* 10*s.* $10\frac{1}{2}$*d.*, and to which he adds 6*d.* worth of iron every year in the share, and which he expects to last for another four years. A yoke worth 1*s.*; a spade, 2*s.*; two hoes, $4\frac{1}{2}$*d.*; two sickles, 5*d.*; a leather bucket costing, all complete, 6*s.*; which was bought last year, and which he expects to last him over next; a rope, 4*s.*, which lasts him two years; and a pulley; a clod crusher he borrows when required. Last year he had chaff for his cattle till August, when he gave them grass till October; after which he gave them millet stalks, of which he has enough to last him till spring harvest.

Agricultural Operations.—Last year Kanhaya had spring harvest as follows:—

	lbs.		*s.*	*d.*
Wheat, $1\frac{1}{2}$ acres produced	410	value	30	0
Bejhra, 3 „	1,150	„	39	0
Rape	165	„	16	0
Safflower seed	-	„	0	9

From this and the price of $\frac{3}{4}$ ton chaff (for which he got 10*s.* $4\frac{1}{2}$*d.*) he paid his rent for a year.

The arrangements for the current year are—

Autumn Harvest.

Joár, $1\frac{3}{8}$ acre	produced	410 lbs.,	sold for 17*s.*
Cotton, $1\frac{1}{2}$ acre	„	130 „	„ 16*s.*
Sawan, $\frac{1}{2}$ acre	„	250 „	kept for house consumption.
Black rice, $1\frac{1}{2}$ acre	„	675 „	
Sesamum,	„	40 „	sold for 4*s.*
Hemp,	„	1 „	made into a rope.

From the above he paid 37*s.* of his rent, borrowed 4*s.* more from the bankers, pledging his sisters' necklets for 4*s.* more, but is still 2*s.* in arrears.

The weeding was done by the family.

Spring Harvest.

Wheat and gram mixed, $1\frac{3}{8}$ acre.

Barley and gram mixed,	$1\frac{7}{8}$ acre,	Some of this on the land previously cropped with rice and sawan.
Gram	$2\frac{3}{4}$ acres.	

Safflower, linseed, and rape mixed in the crops.

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For this he had to borrow 26*s*. worth of seed from the banker, for which he will pay 25 per cent., *i.e.*, 32*s*. 6*d*. worth of grain, whatever the rate at harvest. The seed for the subordinate crops he had at home by him.

His well he dug last year at the end of November, at a cost of 26*s*. including the wattle supports. This year he had to replace these at a cost of 3*s*., and even now the well fails when worked hard. Every year Kanhaya gives the barber, blacksmith, and carpenter a couple of pounds of grain each, and a sheaf of corn.

Account of One Day's Operation.—Of one day at the well, Kanhaya came late, not indeed till 11 a.m., and knocked off work at noon to eat his food; fed his cattle and cut fresh fodder for the evening. About 3 p.m. he began again and left off at 5 p.m. During the day he only lifted 112 buckets and watered less than $\frac{1}{20}$ of an acre, the field being 156 feet. As watering went on, the irrigation beds which had not been made before had to be made.

This shows in what a slovenly and lazy manner some cultivators work, and that it is very unsafe to generalise from particular instances, or to expect too high an average standard of agriculture. On the other hand, the instances of Pattu and Prágdatt prove what a careful cultivator can achieve.

Babu T. N. Mukharji.

Cawnpore.

Daily Life and Circumstances of Three Cultivators in village Binayakpur of the Cawnpore District.

Binayakpur lies about five miles from Cawnpore on the grand trunk road to Farukhabad, and was the first village in the North-Western Provinces visited by the Famine Commissioners. Three cultivators of Binayakpur have been selected for an account of their daily life at the request of Mr. Caird. Notwithstanding its proximity to the town of Cawnpore, the village is purely agricultural, and the account of the daily life of a cultivator of this village may be taken as an example of the daily life of the general mass of cultivators. Before describing the three individual cultivators I have selected, I give here a preliminary account of the village as a whole.

The total area of the village is 585 acres, of which 380 acres are recorded as either cultivated or cultivable, and 205 acres uncultivable.

Three kinds of soil are generally found in the village: matiar or clay, domat or loam, and bhur or sandy loam. The areas under each are respectively as follows:—matiar 7 acres, domat 138 acres, bhur 165 acres, the remainder being unascertained. The soil is on the whole of an average character, neither very good nor very bad.

Irrigation is chiefly obtained from the Ganges canal, a branch of which passes near the village. 78 acres of land are irrigated by flowing, and 216 acres by lifted water, technically termed "flow" and "lift." There is only one well in the village used for irrigating purposes, which waters only two acres of land. The remaining 84 acres are unirrigated.

The total population of the village numbers 414, of whom 212, or 51·21, are males, and 202, or 49·79; are females. Of the males 136 are adults, and 76 under 12 years of age. Of the females 134 are adults, and 68 under 12 years.

Hindús form the entire population of the village, and are divided into the following castes:—Brahman, 5; Thákur, 64; Káyath, 19; Káchi, 140; Ahír, 56; Bairagi, 4; Gosháin, 12; Jogi, 25; Bania, 13; Lodha, 1; Kahár, 4; Nái or barber, 11; Teli or oil-presser, 6; and Chamár, 54. It will be thus seen that the village is chiefly peopled by Thákurs, Káchis, Ahírs, and Chamárs, who form respectively 15, 34, 14, and 13, or 76 per cent. of the total population. Almost all cultivate. Thákurs are of the Rájput clan, and probably are descendants of old proprietors. They are not good cultivators. Ahírs are by caste cowherds, but are very good agriculturists. Káchis are the best market gardeners of the Province, and their presence in the village in large numbers gives it an exceptional character. Chamárs are low-caste agricultural labourers who have generally at least a little land of their own. Divided into occupations, the population may be shown as follows:—cultivators, 269; agricultural labourers, 61; mendicants, 31; menial servants, 18; shopkeepers, 13; barbers, 11; oilmen, 6; milkmen, 3; priest, 1; Government servant, 1. These figures include females and children. The cultivators proper, therefore, comprise 65 per cent. of the total population, and if labourers who are chiefly agricultural be included, the proportion living on land comes to 80 per cent. of the total population.

The population of the village is divided into 87 families, of which 50 families cultivate land for their own profit, and 19 families work on the fields, &c., as labourers. The agricultural families possess 87 male adults, and the 19 labouring families contain only 17 men.

The houses of the village are all built of mud. Of a well-to-do family the house usually consists of a little sitting room outside, with three or four rooms inside for the females. The outside room is fairly neat, but the inside ones are little better than miserable hovels, from which light and fresh air are almost excluded.

The following number of families has the following number of the so-called rooms:—

Number of Families.	Number of Rooms.	Number of Families.	Number of Rooms.
1 have	13	4 have	6
1 „	12	4 „	5
2 „	10	15 „	4
2 „	9	14 „	3
1 „	8	23 „	2
1 „	7	19 „	1

All the houses are either roofed with mud or thatched with straw.

The 50 agricultural families hold 188 acres of land belonging to the village itself, and 78 acres of land belonging to neighbouring villages, total 263 acres; the average holding of each family being 5·26 acres, *i.e.*, for each soul a little less than one acre. The size of the holdings may be further classified as follows —

Families	holding	between	1	and	1½	acres	16
„	„	„	2½	„	5	„	15
„	„	„	5	„	7½	„	8
„	„	„	7½	„	10	„	6
„	„	„	10	„	12½	„	1
„	„	„	12½	„	15	„	2
„	„	„	15	„	17½	„	1
„	„	„			35	„	1
							50

For the 263 acres of land the cultivators pay a rent of Rs. 2,578, or Rs. 9·8 per acre. For the 188 acres of the village land they pay Rs. 2,234, or Rs. 12 per acre. The rents are high on account of proximity to Cawnpore, and much exceed the average rates of the district.

Of the 263 acres of land in the possession of the villagers, 220 acres were under crops during the rabi (spring) and kharíf (autumn) crop of 1878.

The greater part of the proceeds realised from the sale of agricultural produce after paying rent goes to the money-lender. It has been ascertained that at the commencement of the rabi (spring) season the 50 cultivating families had a debt of about Rs. 4,000, and that at the end of the kharíf (autumn) season the amount increased to Rs. 6,700, notwithstanding grain worth Rs. 87/ and Rs. 1,402 in cash, total Rs. 1,479, were paid in liquidation during the year.

The daily expense of food for the 269 souls included in the 50 cultivating families is estimated at Rs. 15, or about 1¼*d*. each person per day. The yearly expendi-

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ture of the 50 agricultural families exclusive of rent is stated to be as follows:—

Agricultural.		Other, exclusive of any repayment of debts or interest.	
	Rs.		Rs.
Rent - -	2,578	Value of food bought or taken from field	5,028
Price of seed -	784	Miscellaneous -	592 (rather high)
Manure - -	24		
Hired labour -	950		
Repair of implements	84	Cloth - -	562
Purchase of ditto -	42	Festivals - -	266
Ditto of cattle -	110		
		Total - -	6,448
Total -	4,572		
		Grand total	11,020

The excess expenditure over receipts from agricultural produce, which must have occurred, is said to have been met by sale of milk, sale of garden produce, wages for labour given on hire, and by fresh debt.

The lands of the village are held under the following kinds of tenures:—

	Acres.
Sir or zamindar's own land - -	30
Maurusi, or with occupancy rights -	228
Ghair-maurusi, or tenancy-at-will -	68
Muáfi and malikana, or rent-free -	5
	321

The rest of the area has not been accounted for.

During the last settlement the total annual value of the lands (rent-roll) was estimated at Rs. 3,500 at full rates, and the Government revenue fixed on this is Rs. 1,750. Including cesses, the demand on the proprietors is Rs. 2,006, or 57 per cent. of the annual estimated collections.

The village is divided into six parts, and possessed by 57 proprietors, all of whom live in villages within two miles and have other landed property. I give in the following statement some figures regarding the holding and income of each proprietor:—

STATEMENT showing the Circumstances of the PROPRIETORS of Village Bináyakpur.

Name of Proprietor.	Profit from Bináyakpur.	Profit from other Villages.	Total Cash Income.	Proprietary Land in Village Bináyakpur.	Proprietary Land in other Villages.	Rented Land.	Total Land held.	Land Cultivated by Himself.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Big. bis.	Big. bis.	Big. bis.	Big. bis.	Big. bis.
Pakhar - -	9 5 3	15 12 0	25 1 3	0 13	2 10	2 0	5 3	3 3
Jodha - -	9 5 3	15 12 0	25 1 3	0 13	2 10	2 0	5 3	3 3
Gruid - -	9 5 3	15 12 0	25 1 3	0 13	2 10	2 0	5 3	3 3
Mewa - -	9 5 3	15 12 0	25 1 3	0 13	2 10	2 0	5 3	3 3
Sheo Narain -	37 5 0	63 0 0	100 5 0	2 12	2 10	—	12 12	—
Thán - -	14 15 0	23 10 0	38 9 0	1 9	7 18½	3 2	12 9½	12 7
Rám Goshain -	7 7 0	11 13 0	19 4 0	0 12½	1 13¼	0 10½	2 16¼	2 16¼
Thakuria Kuwári -	7 7 0	11 13 0	19 4 0	0 12½	1 13¼	0 10½	2 16¼	2 16¼
Chandan - -	3 11 6	5 14 6	9 10 0	0 1	0 17	0 8¼	1 6¼	—
Angat - -	3 11 6	5 14 6	9 10 0	0 1	0 17	0 8¼	1 6¼	—
Hanumán - -	3 11 6	5 14 6	9 10 0	0 1	0 17	0 8¼	1 6¼	—
Shyámal - -	3 11 6	5 14 6	9 10 0	0 1	0 17	0 8¼	1 6¼	—
Durga - -	14 14 0	23 10 0	38 8 0	0 19	3 15½	3 1	7 15½	7 15½
Gulab Kuwári -	14 15 0	23 10 0	38 9 0	1 9	4 5	—	5 14	—
Malla - -	37 4 6	63 0 0	100 4 6	2 4½	10 17	7 10	20 11½	17 11½
Chandi - -	37 4 6	63 0 0	100 4 6	2 4½	10 17	7 10	20 11½	17 11½
Daria - -	74 9 0	—	74 9 0	4 18	—	5 8	10 6	—
Dipa - -	41 4 0	750 5 0	791 9 0	—	—	3 0	3 0	3 0
Sadhan - -	20 10 0	350 0 0	370 10 0	3 19½	7 0	9 0	19 19½	12 0
Indar - -	6 14 0	116 10 8	123 8 8	1 6½	2 6⅔	3 0	6 13⅙	4 0
Raghunandan -	6 14 0	116 10 8	123 8 8	1 6½	2 6⅔	3 0	6 13⅙	4 0
Gajádhar - -	6 14 0	116 10 8	123 8 8	1 6½	2 6⅔	3 0	6 13⅙	4 0
Raghubar - -	10 5 0	144 0 0	154 5 0	3 14	—	—	3 14	3 14
Kishan Kuwári -	10 5 0	144 0 0	154 5 0	3 14	—	—	3 14	3 14
Nand - -	5 2 6	72 0 0	77 2 6	—	1 5	20 0	21 5	20 0
Jewan - -	5 2 6	72 0 0	77 2 6	—	2 6	10 0	12 6	—
Kawala - -	5 2 6	72 0 0	77 2 6	—	2 6	10 0	12 6	10 0
Shiu Rám - -	5 2 6	72 0 0	77 2 6	—	1 6	10 0	11 6	10 0
Bahes Kuwári -	10 5 0	80 0 0	90 5 0	1 8	4 8	3 17	9 13	—
Jham - -	10 5 0	144 0 0	154 5 0	—	3 8	—	3 8	—
Shiudin - -	5 2 6	26 0 0	31 2 6	—	2 14	—	2 14	—
Basant - -	0 13 9	33 5 4	34 3 1		0 8⅙	—	0 8⅙	0 8⅙
Sundar - -	0 13 9	33 5 4	34 3 1	—	0 8⅙	—	0 8⅙	0 8⅙
Angat (No. 2) -	1 11 6	66 10 8	68 6 2	—	0 16⅓	—	0 16⅓	0 16⅓
Mukund - -	1 11 6	66 10 8	68 6 2	—	0 16⅓	—	0 16⅓	16⅓
Himmat - -	10 5 0	600 0 0	610 5 0	—	4 5	—	4 5	—
Gandharb - -	16 15 0	97 10 0	114 9 0	1 8¼	18 5	3 1¼	22 14½	4 11¼
Bhim - -	16 15 0	97 10 0	114 9 0	1 8¼	18 5	3 1¼	22 14½	4 11¼
Ugar - -	16 15 0	97 10 0	114 9 0	1 8¼	18 5	3 1¼	22 14½	4 11¼
Rúp - -	16 15 0	97 10 0	114 9 0	1 8¼	18 5	3 1¼	22 14½	4 11¼
Dulan - -	22 9 4	130 2 8	152 12 0	1 17	24 6⅔	14 15	40 18⅔	2 13⅓
Pahap - -	22 9 4	130 2 8	152 12 0	1 17	24 6⅔	14 15	40 18⅔	2 13⅓
Sandar - -	11 4 8	165 1 4	176 6 0	0 18½	12 3⅓	7 7½	20 9⅓	1 6⅔
Bhúp - -	11 4 8	65 1 4	76 6 0	0 18½	12 3⅓	7 7½	30 9⅓	1 6⅔
Manohar - -	67 12 0	390 8 0	458 4 0	6 6	73 0	1 0	80 6	12 5
Chain - -	67 12 0	331 8 0	399 4 0	5 10	73 0	4 5	82 15	14 10
Janak - -	20 13 4	166 10 8	187 8 0	—	5 6⅔	—	5 6⅔	4 0
Reoti - -	20 13 4	166 10 8	187 8 0	—	5 6⅔	—	5 6⅔	4 0
Tirbhu - -	20 13 4	166 10 8	187 8 0	—	5 6⅔	—	5 6⅔	4 0
Harchand - -	62 8 0	500 0 0	562 8 0	—	16 0	—	16 0	12 0
Mohan - -	62 8 0	500 0 0	562 8 0	—	16 0	—	16 0	
Goláb Kuwári -	78 2 0	500 0 0	578 2 0	—	20 10	9 10	30 0	17 0
Hemá Chal - -	49 12 0	—	49 12 0	—	—	—	—	—
Fateh - -	49 12 0	—	49 12 0	—	—	—	—	—
Sheo Bakhsh -	49 12 0	—	49 12 0	—	—	—	—	—
Mahipál - -	136 0 9	260 0 0	396 0 9	—	27 4	0 10	27 14	20 14
Seo Ratan - -	21 7 0	—	21 7 0	—	—	—	—	—
Total - -	1,306 9 9	7,309 7 0	8,616 3 9	59 12	490 8½	183 17	733 17½	255 1

NOTE.—A *bigha* is equal to nearly half an acre.

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Babu T. N Mukharji.

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Example 1. *Head of a Well-to-do Family.*—Mihrbán Singh, caste Thákur, of the Chandel tribe, by occupation a cultivator. His family consists of himself, age 50; his eldest son, Dhákan Singh, age 24 years; his second son, Gajádhar, age 16 years; his wife, Mithána, age 40 years; Dhákan's wife, Ganga Kumári, age 20 years; and Rukman Kumári, wife of Gajádhar, age 13 years; total, six members.

Holding.—His holding is 10 acres, for which he pays rent Rs. 7.12.5. He holds three acres, with occupancy rights, the rent of which is Rs. 19 2 5, paid to zamindars, Himachal Singh, Pakhar Singh, and Janak Singh, of Kakadeo, two acres as a sub-tenant from Mehrai Gararia, at a rent of Rs. 16, and five acres at Lakhanpur, a neighbouring village, for which he pays Rs. 36 rent. All the land is irrigated from the canal, for which advantage he has paid Rs. 10 to the canal authorities in the current year.

He has at present no bullocks, as he has lately made them over to his money-lender in liquidation of debt.

Agricultural Operations.—In the rabi (spring) of 1878 he sowed the following crops: wheat, sarson, and lahi (mustard species) together on two acres. He sowed wheat and sarson broadcast at the rate of 100 lbs. per acre of the former and 1 lb. of the latter. Lahi was sown in rows, 1 lb. being sown on each acre in three rows. He states that the produce was 400 lbs. of wheat, 320 lbs. of wheat straw, 320 lbs. of sarson (mustard), and 8 lbs. of lahi (mustard species).

Barley was sown on three acres, and the outturn is stated to have been 2,000 lbs. of grain and 1,200 lbs. of straw; the remaining five acres were not sown with any crop. He represents the value of all this produce, excluding the straw, to have been Rs. 84; but he gave all the produce in grain to the money-lender. With the straw he fed his bullocks. On the fields prepared for the spring crops he put seven carts, or about 105 cwts. of manure, which consisted of house-sweepings and cowdung.

In the rains of 1878 he sowed the following crops: joár (Holcus sorghum, a millet), 1¼ acres, mixed with a small quantity of mung (Phaseolus mung, a pulse) as an undergrowth; produce: joár, 640 lbs.; mung, nothing; maize, half an acre, with phút (Cucumis momordica) under it; produce: maize, 80 lbs., and phút, 160 lbs. Sesamum, one quarter of an acre; produce, 20 lbs. of seed. Indigo, one acre; produce, 480 lbs. of seed. The value of all this was Rs. 67, but it all went to the money-lender except Rs. 4, which was paid for labour he hired. Besides the produce given above he now and then took small quantities of joár or a few cobs of Indian corn, &c. for his current expenses; he put 45 carts of manure into the kharíf (rain crop) fields.

Debts.—Before the scarcity of *1877 his* debts amounted to Rs. 150. During the scarcity he borrowed Rs. 125 worth of grain: wheat, 1,280 lbs., Rs. 50; bejhra (barley and peas mixed), 1,000 lbs., Rs. 50; and straw for cattle, 14,400 lbs., Rs. 25. In 1878 he took Rs. 375 for paying rent, for food expenses, and for the marriage of his second son Gajádhar. His total debts, therefore, amounted to Rs. 650 in 1878, out of which he paid spring crops to the value of Rs. 84 and Rs. 63 worth of rain crops. He pays interest at the rate of Rs. 2 per cent. per month.

Clothing.—He has the following wearing apparel in his house:—

Of Mihrbán Singh himself:

One dhoti (waist cloth) of English cloth, five yards, price Re. 1; one dhoti of country cloth, called garha, 12 annas; one mirzai (shirt) of English cloth, eight annas; one dopatta (sheet) of English fine cloth, 12 annas; one angochha (napkin), two annas; one mattress, Re. 1; one razai (quilt), Re. 2. Total, Rs. 6 2 0.

Dhakan Singh, eldest son, has the following clothes:—

	Rs.	a.	p.
2 waist cloths of English stuff -	1	8	0
1 shirt of ditto -	0	8	0
1 sheet of country cloth - -	0	8	0
1 napkin - - -	0	2	0
1 mattress - - -	1	0	0
1 quilt - - - -	2	0	0
Total -	5	10	0

Gajádhar, second son, lives in his grandmother's (mother's mother) house, some 20 miles away.

Mithána, wife of Mihrbán Singh, has the following:—

	Rs.	a.	p.
2 lehngas (petticoat) - -	2	0	0
1 shawl - - - -	1	0	0
2 small shawls - - -	0	9	0
2 sinábandh (breast-band) -	0	4	0
Total -	3	13	0

Ganga Kumári, wife of Dhakan, has the following:—

	Rs.	a.	p.
2 petticoats - - -	2	2	0
1 shawl - - - -	1	0	0
2 smaller shawls - - -	0	10	0
Total -	3	12	0

Rukman Kumári, wife of Gajádhar, has the following:—

	Rs.	a.	p.
2 petticoats - - -	2	0	0
1 shawl - - - -	0	12	0
1 small shawl - - -	0	5	0
Total -	3	1	0

Besides above there are four old quilts in the house, which are used in the cold season. Each of the male members of the house have also one quilted shirt of English chintz, and the women have each a silken petticoat, price Rs. 2, and one shawl of jamdani (cloth, with flowers of needlework), price Re. 1 8 0, and one larger shawl, price Rs. 2 each, which are worn on holidays and festivals.

Jewellery.—In the shape of ornaments Mihrbán's wife has one nose-ring made of gold, price Rs. 2; and anklets made of bell-metal, price Re. 1 8 0. Ganga and Rukman, the two daughters-in-law, have each of them a nose-ring of gold, price Rs. 20; armlet of silver, price Rs. 15 to Rs. 20; and anklets of bell-metal, price Re. 1 8 0.

Utensils and Furniture.—The cooking utensils and eating plates in the house are as follows:—

	Rs.	*a.*	*p.*
2 lotas (brass jugs) - -	*2*	*0*	*0*
2 thalis (brass plates) - -	*2*	*0*	*0*
1 batua (brass pot) - -	*2*	*0*	*0*
1 ditto, smaller - - -	*1*	*0*	*0*
1 glass of bell-metal - -	0	8	0
1 iron pan - - -	2	0	0
1 ,, spoon - - -	0	2	0
1 ,, pan for making cakes -	0	4	0
1 ,, spoon (big) - -	0	6	0
1 ,, tongs (chimta) - -	0	1	0
Total -	10	5	0

Besides above furniture he has two cups of bell-metal, three boxes of wood, two wooden plates, one mat of jute cloth, and eight bedsteads.

Agricultural Implements.—His agricultural implements are the following:—

	Rs.	a.	p.
1 plough, with 4 lbs. of iron -	0	6	0
1 yoke of wood - - -	0	2	0
1 small spade (khurpi) - -	0	1	3
2 sickles - - -	0	3	0
1 chopper - - -	0	6	0

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	Rs. a. p.
1 axe - - - -	0 2 0
1 spade (big) - - -	1 0 0
Total -	2 4 3

All these implements he bought except the woodwork, which he got made by a carpenter.

Dwelling.—His house is of mud, and was built by his father and uncle. It consists of four rooms, three verandahs, and two out-rooms. The house is shared by his three other brothers, who live in it, but eat separately. The value of the house is now estimated at Rs. 200. Its repairs cost the four brothers about Rs. 15 annually.

Orchard.—Mihrbán Singh and his three brothers possess in common two mango garden on 1½ acres of land, containing 30 trees, and two gardens of jujube on half an acre of land, containing 25 trees. The fruits are in some years sold, while on others eaten. Last year they were sold at Rs. 28, of which Mihrbán Singh got his share of Rs. 7.

Food.—The family live on joár (Holcus sorghum) in November and December, on bájra (Penicillaria spicata, a millet) in January and February, and on bejhra (barley and peas mixed together) in other months. The grain is powdered into coarse flour and cakes made of it, which are eaten with a soup made of split peas or pulses, chiefly of arhar (Cytisus cajan) or vegetable, meat, or fish curry. But soup of split peas is the rule. The quantity of food daily consumed by this family of five members is, flour, 10 lbs.; split peas, 1 lb.; salt, 2 ounces. The following extra expenditure is also incurred during the year: oil of mustard, Rs. 12; tobacco, Rs. 9; spices, consisting of turmeric, coriander seed, and red pepper, Rs. 3; betel-leaf, Rs. 9; fish, meat, and vegetables, Rs. 3. Fuel is not bought, but obtained from dried cowdung, now picked up from here and there, as there is no cattle in the house.

Account of One Day's Operations.—On the 1st of May 1879, Mihrbán Singh rose in the morning and went with two hired labourers to the farmyard where bejhra (barley and peas mixed) was being threshed. He worked on it till 10 o'clock, when he returned home and took his meal, which consisted of cakes of about 1 lb. of bejhra flour, ¼ lb. of pulse (arhar) soup, and some unripe mango ground with red pepper and salt. After meal he went with his brother-in-law to the judge's court at Cawnpore, where the latter had some work. There he sat with the revenue agents (mukhtars), when his brother-in-law looked after his work. He came back at 8 o'clock in the night and took his evening meal, consisting of the same as in the day, and went to sleep outside the house.

Dhákan Singh rose early in the morning and went to hire two labourers, whom he brought and made over to his father, who took them to the farmyard. He remained at home doing nothing, when his father came back, and he went to the farmyard and worked with the labourers in threshing the bejhra (barley and peas). At 12 o'clock he returned home, took his food of 1 lb. of bejhra flour cake, ¼ lb. of arhar, and some mango. He then took rest for some time, and then again went to the farmyard with the labourers. At nightfall he returned home and sat outside his house, smoking and chatting till 9 o'clock, when he took his evening meal, consisting of the same food as in the day, and went to sleep on the roof of the house.

Mithána, Mihrbán Singh's wife, rose early in the morning, washed, and employed herself in cleaning the cooking utensils and the cooking-place, with the assistance of Ganga, her elder daughter-in-law. Then she raised water from the well which is inside the house, and after doing this she made cakes of cowdung collected from the farmyard, and spread them in the sun to dry for fuel. She then assisted Ganga in cooking the meal of the family for the day. At 10 o'clock her husband returned from the farmyard, to whom she gave food. At 12 o'clock her son came, and after feeding him, she and her daughters-in-law took their meal and went to take rest for two hours. Her food consisted of cakes made of a little less than 1 lb. of bejhra (barley and peas mixed), flour, and the usual soup of arhar pulse. At 2 she swept the house, washed the utensils, cleaned the bejhra grain for next day's food, and gave it to a (woman) neighbour for being ground into flour. In all this Ganga assisted her. In the evening she and Ganga cooked the food for the night. At 9 o'clock, after feeding the male members, the women took their food. Mithána then went to sleep on the roof of the house.

Ganga Kumári, wife of Dhákan Singh, rose in the morning, washed, and then ground 10 lbs. of bejhra for the food of the family on that day. She then assisted her mother-in-law in cleaning the house and making preparations for cooking the food. She herself cooked the food, assisted by her mother-in-law. After the siesta in the noon she assisted her mother-in-law in cleaning the grain for the next day, and at the same time chatted with a neighbour, a Káchi woman, who came to pay her a visit. In the evening she again cooked the food, assisted by her mother-in-law, and, after taking her meal in the night, went to sleep with her husband on the roof of the house at 10 o'clock. She does not always grind the flour, but it is now and then given to a woman, to whom half an anna is paid for grinding every 10 lbs. of grain.

Rukman Kumári, the second daughter-in-law of Mihrbán Singh, is young and not allowed to work at present.

Example 2. A Family of Middling Circumstances.—Sewak, called in the village Shiuki, caste Káchi, by profession a cultivator. His family consists of himself, age 55 years; his eldest son, Chiranju, age 27 years; second son, Gumáni, age 22 years; third son, Durján, age 17 years; his wife, Khosála, age 50 years; Chiranju's wife, Rukmini, age 25 years; Makhana, wife of Gumáni, age 20 years; Sukhia, daughter of Sewak, age 9 years; and Raghubara, son of Chiranju, age 6 years.

Holding.—Sewak's holding is as follows:—At Bináyakpur he holds three acres at a fixed tenure, for which he pays Rs. 45 3.3. to Janak Singh, zamindar of Kákádeo; he rents 1¼ acre as a sub-tenant from Thakur Bandi Singh, for which he pays Rs. 17. The soil of this 4¼ acres is domat (loam), of which 3¼ acres are irrigated from the canal, for which privilege he pays Rs. 7.2.0 to the canal authorities. The remaining one acre, on which he produces vegetables and garden crops, is irrigated from a well. Besides this he holds at Lakhanpur, a neighbouring village, six acres of land as a tenant-at-will, for which he pays Rs. 17 to the manager of the Rawatpur estate. This land is of bad sandy soil and is unirrigated, producing only one crop, that of the rains in the year. He thus cultivates 10¼ acres of land, paying Rs. 79.3.3 as rent to zamindars, and Rs. 7.2.0 to canal authorities; total, Rs. 86 5 3.

Plough Cattle.—He purchased a pair of bullocks, six years ago, at Rs. 36. They are eight years old now, and one of them has become almost useless. Besides, he has a pair of goats. The following is his account of the agricultural operations of the year:—

Agricultural Operations.—In the rabi (spring) of 1878, he sowed 1¾ acres with wheat mixed with sarson and lahi (mustard species). He first sowed wheat seed broadcast; then sprinkled sarson seed on the field; lastly, he put lahi seed in rows at the rate of six per acre, the breadth of each row being a cubit or so. The produce was wheat, 480 lbs.; straw, 480 lbs.; sarson, 80 lbs.; láhi, 40 lbs. Barley was put on 1½ acres; produce 640 lbs. of grain and 640 lbs. of straw. On half an acre he put peas, the pods of which he sold green at Rs. 2; onion, one acre, produce gradually sold at Rs. 50; carrots, half an acre, produce 1,440 lbs., sold at Rs. 9. The total sum he obtained was Rs. 104.

In the kharíf season of 1878 he sowed:—

Joar (Holcus sorghum), one acre, produce 480 lbs. of grain, value Rs. 12; Indian corn, 1¼ acres, produce

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880 lbs., value Rs. 22; indigo, 1½ acres, produce 120 lbs. of seed and 240 lbs. of plant, value Rs. 25; vegetables, 1¾ acres, produce sold at Rs. 50. With joar he sowed some mung and lobia (pulses), but the out-turn was nil. People in his village usually sow phút (gourd eaten raw) with maize, but he did not do it. The total sum he obtained by selling his rain crops was Rs. 109.

He can afford to put very little manure into his field. As he chiefly lives on the proceeds of his vegetable garden, he puts the greater part of the manure he can collect into it. In 1878 he purchased 150 cwts. of manure (10 carts full) from one of the villages, which consisted of cowdung and sweepings. He put this into his vegetable ground. His home manure filled six carts (85 cwts.), which he put into his rain crop fields.

Debts.—The produce of the rain and sping harvests are almost entirely sold, and the proceeds generally given to his money-lender, who at the harvest time watches him. Only when the crop is ripe can he take small quantities of grain for daily use. The fodder from the rain crops he is allowed to give to his cattle.

His money-lender is Gopál, Káchi. Before the scarcity season (1877) he had an old outstanding debt of Rs. 105, which he took for paying rent, for hired labour, for cloth and food expenses, not for any marriage, feast, or festival. In the scarcity year he took Rs. 62 in cash. He pays interest at the rate of Rs. 2 per cent. per month, or 24 per cent. He does not borrow grain, for in that case he has to pay back with 25 per cent. interest, besides 4 lbs. extra for every 80 lbs. From the proceeds of the spring crops he gave to the money-lender Rs. 69, but did not give anything from the rain crops. He had thus some money left in hand, with which he paid his rent, bought clothes, and met miscellaneous expenses. At the end of the autumn harvest the balance of his principal debt amounted to Rs. 98.

Clothing.—At present the members of his family have the following wearing apparel:—

Himself and other male adults of the family have each one waist cloth (dhoti), value Re. 1; one napkin (angochha), 4 annas; one shirt (mirzai), 8 annas; one sheet, 8 annas. This is worn all round the year. In the cold season they cover themselves with a quilt (razai) made three years ago at Rs. 2 each. His grandson, Raghubara, has two napkins, purchased at Re. 1, and one shirt at 6 annas. The female adults have each one petticoat, value Re. 1; one sheet at 8 annas; and one shirt (kurta), old, at 4 annas. Sukhia, the daughter, has, besides these, one extra sheet. The daughters-in-law have also holiday clothes, consisting of one petticoat made of check cloth, and one sheet of red cloth called salu, both costing Rs. 4 8. These were given to them when they first came to Sewak's house some 10 years ago. The clothes of the male members are generally of English cloth called markín, the sheets being of country coarse cloth called garha.

Jewellery.—Of ornaments, Sewak's wife has a pair of anklets made of brass, weighing eight ounces, price 6 annas; brass rings for her toes, price 2 annas; and a nose-ring of gold, price Rs. 4. The daughters-in-law have the same, but their nose-rings cost Rs. 5 each. They also wear lac bangles, price 2 annas for about 20, worn at one time on both the hands. They have also made a hole in their ears, in which they wear a cork-like ornament made of palm leaf and lac, a pair of which can be had at a quarter of an anna (about a farthing).

Utensils and Furniture.—The furniture of Sewak's house consists of two brass plates (thali), weighing 4 lbs., price Rs. 2; two cups of bell-metal, 2 lbs., Rs. 2; two brass jugs (lota), 3 lbs., Re. 1 8; one brass cooking pot (batloi), 3 lbs., Re. 1 8; one iron pan for making cakes, 2 annas; one iron spoon, 1 anna; two husking mortars made of wood, 4½ annas; and three old bedsteads (khatoli), price when new about Re. 1 8.

Agricultural Implements. — His agricultural implements are—one plough, Re. 1; one yoke, 4 annas; five khurpas (small spade), 10 annas; five sickles, 9 annas; one chopper, 8 annas; one old pur (apparatus made of leather for raising water from a well), Rs. 5; and one rope, Re. 1—total, Rs. 8 15.

Dwelling.—His house is of mud, gradually built and repaired during the last 30 years. It consists of three rooms inside and a small room outside. The materials cost him about Rs. 30, and he paid very little for labour. He spends about Rs. 3 every year for repairs.

Food.—The food of his family consists of joár (a millet) in November and December, bájra (another species of millet) in January and February, and bejhra (barley and peas mixed) in other months. Wheat is eaten only at feasts and festivals. The quantity of food daily consumed in his family is flour 16 lbs., split peas 3 lbs., salt 2 ozs., powdered grain (satu) or parched gram (chabena) as lunch 2 lbs. Vegetables, fish, or meat are seldom bought, but the first is obtained from his own garden, and now and then substituted for the soup of split peas. The family takes two meals during the 24 hours—once at 12 o'clock in the day, and again at 8 or 9 in the night. The workers take a breakfast of satu or chabena, besides, at 10 o'clock in the day. The miscellaneous expenditure consists of oil Rs. 12 in a year, tobacco Rs. 5, spices (turmeric, red pepper, and coriander seed) Rs. 3, and Rs. 3 paid in kind for barber and washerman. Sewak does not purchase fuel, neither does he ever pay anything for doctor or medicine.

Account of One Day's Operations.—Sewak is an old man, and he does not do heavy work. On the 1st of May last he rose in the morning and sat outside his house till 10 o'clock, when he washed himself and went to the farmyard, where the spring crops are being threshed. He looked in to one thing and another till 12, when he took his food, which consisted of cakes made of about 2 lbs. of bejhra (barley and peas), flour, soup of ¼ lb. of split peas, and some green mango ground with red pepper and salt. Then he took a nap till 3, when he came outside his house and played and chatted with his grandson Raghubara. He did no work in the evening, but sat quiet or smoked or chatted till 9, when he took his night meal, which was as in the day, but in a little less quantity. He slept in the night at the farmyard.

Chiranju, the eldest son, and brothers rose early, smoked tobacco, and went to irrigate the yam and onion field by lifting canal water with his brothers Durján and Gumáni and a hired labourer. At 10 the three brothers came home, took each ¾ lb. of satu, or powder made of parched barley and peas, and then again went to their work. At 12 they again came home and ate their noon meal, which consisted of the same as eaten by Sewak. They then took rest for two hours, and then again commenced to irrigate the land, which they did till nightfall. During their work nobody came to them, except a stranger who was passing by the road. He sat for some time where they were working, and went away, remarking that the place where they stand to lift water is well shaded. At evening they came home and sat outside the house, smoking and chatting till 8 o'clock, when they took their evening meal, which was of the same things as in the day. Chiranju slept outside the house, and Durján and Gumáni at the farmyard with their father.

Khosála, wife of Sewak, rose after the sun was up, brought out the two goats from the fold and cleaned their place, and then gave them some mustard leaves which were in the house. She then fed Raghubara with some cakes saved from last day's food, adding a little salt. At 8 she went to the vegetable field to assist her sons in regulating the flow of the water thrown into it by the men. At 10 she returned home and began to sew a quilt. After the men had taken their food at 12, she ate cakes of about 1¼ lb. of bejhra flour with soup of split peas, and took rest till 2 o'clock; she then again employed herself in sewing the quilt.

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during which time a neighbour (woman) came, with whom she talked of household affairs. In the evening she talked with the children who came back from the field. At 8 in the night she took her evening meal, consisting of the same as in the day, but in less quantity. She slept inside the house, taking with her her grandchild Raghubara.

Rukmini, wife of Chiranju, rose early in the morning, and with Makhána, the wife of Gumáni, ground 16 lbs. of bejhra for the food of the family during the day. Rukmini then cleaned the place where cattle are kept, made the dung into cakes, and spread them in the sun to dry for fuel. Makhána cleansed the utensils. At 10 Rukmini cooked the food with the assistance of Makhána. Sukhia went with water and tobacco to her brothers in the field. At 12, after feeding the male members, Rukmini and Makhána took their food of 1 lb. of flour cake with soup of split peas. They took rest for two hours, and then rose and cleaned the grain for next day's food; after which they fetched water and cleaned the utensils and the cooking-place. In the evening Rukmini again cooked the food, assisted by Makhána. At 8 they took their evening meal and went to sleep inside the house. Sukhia and Raghubara do not work but go to the field with lunch water, and tobacco, for the workers.

Example 3. *A Family of Poor Circumstances.*—Lálua, caste Káchi, by occupation a cultivator and a labourer. His family consists of himself, age 28 years, and his wife, age 15 years.

Holding.—He holds 3 acres on a fixed tenure from the zamindar and ⅛ acre as a sub-tenant from Iswari, Káchi, of Bináyakpur. The soil of his land is loam 1⅛, and sandy loam 2 acres. He pays rent Rs. 17.8.0 for the land he holds direct from the zamindar, which he irrigates from the canal, and pays Rs. 5 more for water-rate. For the land which he sub-rents he pays Rs. 4; in this he grows vegetables. He has no bullocks of his own, but gets them on hire when he wants their services.

Agricultural Operations.—In the spring season of 1878 he sowed 1½ acres with wheat, sarson, and lahi (mustard species). He put 120 lbs. of wheat seed in the 1½ acres, 1½ lbs. of sarson seed, and 1½ lbs. of lahi seed, the last sown in rows as usual. The produce was wheat, 400 lbs., value Rs. 15; straw, 240 lbs., Re. 1 8 0; sarson, 160 lbs., Rs. 8; lahi, 80 lbs., Rs. 3; barley sown alone on ½ acre, produce 320 lbs., Rs. 8; peas on ⅛ acre, produce 80 lbs., Re. 2; straw of barley and peas, 240 lbs., Re. 1. Total spring crops, 2⅛ acres, value Rs. 38.8.0. He did not sow any spring crops on the remaining 1 acre. He put on his wheat field five carts of manure (75 cwt.), which consisted of cowdung picked up by him in the village and the sweepings of his house.

His rain crops of 1878 were joár ¾ acres, produce 320 lbs., value—grain, Rs. 8; fodder, Rs. 5. With this he also put some pulses (Phaseolus radiatus and mungo), but obtained no return. Maize, ½ acre, produce 80 lbs., Rs. 2, fodder, Re. 1. He put gourd with it, which he sold at Rs. 2. *Bhindi* (Abelmoschus esculentis), and torai (Luffa pentandra), ½ acre, produce 640 lbs., value Rs. 16. Total value of rain crops, Rs. 34. The remaining 1¼ acre he left fallow for spring crops. He put 10 carts of manure into the maize and vegetable field. Before the scarcity season his debts amounted to Rs. 24, which he had borrowed from Shiu Charan, Ahír, of a neighbouring village, for paying rent and food expenses. He took from him again Rs. 20 during the scarcity for food expenses. From the proceeds of the spring crops he paid Rs. 21.8.0 for rent, and Rs. 16.8.0 to Shiu Charan. He also paid him Rs. 16 from the rain crops. During 1878 he borrowed a further sum of Rs. 10.12.0 for paying rain crop rents, and another sum of Rs. 10 from Jadu Nath Singh of Kákádeo for buying clothes and food. Besides all this, he also took now and then small quantities of grain from Shiu Charan for current expenses. His cash debts now amount to Rs. 32 principal, for which he pays 24 per cent. interest

Clothing.—He and his wife have the following wearing apparel:—Himself, 2 markín waist cloths, Rs. 2; 1 napkin, 2 annas; 1 shirt, 5 annas; a quilt made three years ago at Rs. 2.12.0. Wife's petticoat, Re. 1; 1 shawl, 8 annas; 1 old shirt, 4 annas. She has a nose-ring of gold, price Rs. 3; anklet of bell-metal, ¾ lb., value 8 annas; bell-metal rings for toes, 4 annas.

Utensils and Furniture.—Lálua's household furniture is as follows:—

1 brass plate, 2 lbs., Re. 1; 1 brass jug (lota), 1½ lbs., 10 annas; 1 brass pot (batloi), 4 lbs., Rs. 2. Besides these he has 1 wooden husking mortar, 1 iron spoon, 1 iron pan, and 2 bedsteads, 1 good and 1 broken.

Agricultural Stock.—His agricultural implements are 2 sickles, price 3 annas, and 1 small spade (khurpi), 2 annas. He hires ploughs, &c.

Dwelling.—His house is of mud, built by his grandfather and father. It consists of two rooms inside and one room outside. Its value is estimated at Rs. 20.

Food.—The quantity of food daily consumed in his family is bejhra flour (barley and peas mixed), 3 lbs., arhar (Cajanus indica) peas 1 lb., and a little salt. During the hot season, on certain days, 1 lb. of satu (barley and peas parched and ground), is also eaten. Vegetables obtained from his own field is now and then eaten; fish, meat, or milk very seldom.

He also works as day labourer when there is no work in his own field. He then gets 1½ anna per day with ¼ lb. of parched grain, or 2 annas without it. During the year he earns Rs. 8 or 9 in this way, and from it he meets the canal rate, expenses for oil, tobacco, and other miscellaneous items. He himself also, on the other hand, hires labour and cattle for which he pays about Rs. 3 in a year.

Account of One Day's Operations.—On the 1st of May last he rose early in the morning and commenced to weed his ½ acre of yam. At 10 his wife took to him ¾ lb. of parched grain (chabena), which he ate and again went to work. At 12 he came home and ate cakes made of 1 lb. of (bejhra) flour and ¼ lb. of split peas, after which he smoked twice and took rest for two hours. At 2 he rose again and went to weed the field, in which he remained engaged till nightfall, when he returned home, sat outside his house smoking and chatting with his mother and sister-in-law (brother's wife), who live separate. He then took the same quantity of food as in the day, and at 10 o'clock went to bed.

His wife rose in the morning and ground 3 lbs. of bejhra for the daily food of the family. Then, after fetching water, she cleaned the cooking-place and the utensils. At 10 she took parched grain to her husband in the field, and returning from there, cooked the food for the two meals (day and night). At 12, after feeding her husband, she herself ate food and took rest for 2 hours. At 2 she picked up some cowdung in the village, made it into cakes, which she spread out in the sun to dry for fuel. Then she swept the house and fetched water. In the evening, after feeding her husband, she herself ate food and went to sleep at 10. She cooked on this day 3 lbs. of bejhra flour and 1 lb. of arhar dal. They say that they can eat more, but cannot afford to do it.

NOTE.—In reading the above account it must be remembered that "kachis" or "market gardeners" are above the average of ordinary cultivators both in skill and industry. They are, however, made in consequence to pay higher rates of rent by landlords.

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Ordinary economic condition of agricultural population.—Agriculturists divided into three classes.—In order most clearly to set forth the ordinary economic condition of the rural agricultural population, *i.e.* those directly engaged in the cultivation of land, it will be useful to divide them, proprietors as well as cultivators, into three broad classes.

A. Those who take no personal share in the actual work of agriculture beyond superintendence of servants and hired labourers, and whose women do not appear in public.

B. Those who themselves engage in agriculture, and whose women assist them; extra labour being engaged at times of pressure, and for the cultivation of so much of the holding as may be beyond their own capabilities.

C. Those who depend solely on their own labour, and that of their families, for the cultivation of their lands.

* * * *

Disposal of produce.—The more valuable crops—wheat, rice, cotton, sugar, barley—are, as a rule, first disposed of to pay the rent, enough being retained for seed by those who are not too deeply in debt. Agriculturists of class A. also retain a sufficiency of the best crops for purposes of entertainment. Those of class B. rarely can do so; class C. never (also see para. 13 *infra*).

Uneatable products.—All the uneatable portions of crop (karbi, straw, bhusa) are sold, save what is required for the food of the cattle of the producer.

Field wages.—Field wages are never paid in the better classes of grain. The cheapest grain of the day is given.

Servants.—Agriculturists of class A. all entertain at least two permanent farm servants, viz., one ploughman and one herdsman; where the holding is large, more than one ploughman is kept, but never more than one herdsman. These men do all the ploughing, sowing, and irrigating; and they also prepare the master's chillam (*i.e.* pipe), gather upla or cowdung fuel, bring in firewood from the jungle, and do all such miscellaneous out-door work.

Agriculturists of class B. usually retain a ploughman and herdsman only so long as their services are actually in request; but when there is no member of the family who can perform the duties of herdsman, a man is retained permanently by this class also for this latter labour.

These farm servants are usually paid in grain; when in cash it is never at a higher rate than Rs. 2 per mensem.

Cash expenditure annually.—Certain agricultural necessaries have to be purchased in cash. A set of agricultural implements — hoe (*kudál*), shovel (*phaura*), ploughshare (*phâr*), chaff-chopper (*gandása*), sickle (*hansia*), grass-scraper or hand hoe (*khurpa*)—costs from Rs. 2-8-0 to Rs. 3 the set. The wooden portions cost nothing, being contributed by the landlord from trees growing in the village. Once purchased, they cost practically nothing in repairs, this being done by the village blacksmith and carpenter, who each get in return a few handsful of grain per plough at harvest time as a perquisite. About 8 annas per annum should be allowed for renewals.

The skin in which water is raised from the wells (*moth* or *charsa*) costs Rs. 2, and has to be renewed annually.

The rope by which water is raised (*nar* or *lao*) has to be renewed every two years. To agriculturists of class A. this rope costs Rs. 2 (viz., flax Re. 1 and labour Re. 1. To classes B. and C. it costs nothing if they have grown their own flax; if not, it costs them Re. 1 for flax, and they make it themselves.

The above implements have to be procured and kept by all classes of cultivators.

II. *On the household.*—*Clothing.*—Weaving is done to a greater or less extent in the household by the women of all three classes of agriculturists, and by the old women always. Of course, the more of this work done in the house, the less the cost of clothing the family. But certain articles of clothing must be purchased for cash annually. The following may be taken as a fair estimate of this expenditure for each class:—

Class A.

For each male—	Rs.	a.	p.
2 cotton waist-cloths (*dhoti*) at Re. 1	2	0	0
1 short cotton coats (*mirzái*) at as. 8	1	0	0
1 cotton sheet (*chádar* or *galáf*), lasts two years and costs Re. 1 -	1	0	0
1 short padded cotton coat for cold-weather wear at Re. 1 - -	1	0	0
1 pair of shoes - - - - -	1	0	0
1 padded quilt (*razai*), lasts two years and costs Re. 3 - - -	1	8	0
1 groin cloth (*phenta* or *angochha*) -	0	8	0
Total annual cost of clothing -	8	0	0
For each female—			
1 cotton petticoats (*sari*) at Rs. 2 -	4	0	0
1 „ sheet (*chadar*) at Re. 1 -	1	0	0
1 padded quilt (*razai*) for two years at Rs. 3 - - - - -	1	8	0
Total annual cost of clothing -	6	8	0

Class B.

For each male—			
2 cotton waist-cloths at Re. 1 - -	2	0	0
1 single cotton coat - - -	0	5	0
1 double „ for cold weather	0	9	0
1 sheet at Rs. 2 for two years - -	1	0	0
1 pair of shoes - - - -	0	6	0
1 groin cloth - - - - -	0	6	0
1 blanket for two years at Re. 1 -	0	8	0
Total annual cost of clothing -	5	2	0
For each female—			
2 cotton petticoats at Re. 1 - -	2	0	0
1 blanket for two years - - -	0	8	0
Total annual cost of clothing -	2	8	0

Class C.

For each male—			
2 coarse cotton waist-cloths at annas 12 - - - - - -	1	8	0
1 blanket at Re. 1 for two years -	0	8	0
1 double cotton coat - - -	0	8	0
Total annual cost of clothing -	2	8	0
For each female—			
2 coarse petticoats at annas 12 -	1	8	0
1 blanket for two years - - -	0	8	0
Total annual cost of clothing -	2	0	0

Household Implements.—Classes A. and B. use metal dishes—brass for Hindús and copper for Muhammadans. A full set for one person comprises and costs as follows:—

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(*a.*) For Hindús—

	Rs.	a.	p.
1 brass lota or goglet	1	2	0
1 ,, tháli or plate	1	1	0
1 ,, abkhora or drinking glass	0	10	0
1 ,, batua or pipkin	1	12	0
1 iron tawa or baking plate for flat cakes	0	4	0
1 iron karáhi or basin	0	8	0
Total cost	5	5	0

(*b.*) For Muhammadans—

	Rs.	a.	p.
1 copper lota	1	2	0
1 ,, katora or drinking cup	0	6	0
1 ,, rikábi and piyáli or plate and bowl	0	11	0
1 copper patili or cooking pot	1	6	0
1 iron tawa	0	4	0
1 ,, karáhi	0	8	0
Total cost	4	5	0

A single article of each of the last four descriptions of vessels of both (*a.* and *b.*) suffices for an ordinary family, as also does one *tháli* among Hindús; but where there are more than two grown-up males in residence more than one *tháli* is generally used among the better classes of Hindús. Each grown-up male has a *lota*, and among Musalmans a *katora* also. Renewals of the stock are seldom necessary, but additions are made in favourable years as they can be afforded, this being the commonest form of funding surplus cash.

Agriculturists of class C. possess few brass dishes, using chiefly earthen and wooden vessels.

Dwellings.—None of the purely agricultural classes live in masonry houses.

The houses of classes A. and B. are the same in kind, and differ only in the degree of spaciousness and the number of rooms. The walls are of mud, and the roofs generally of grass or home-made tiles laid on bamboos; sometimes of earth laid flat on a platform of tamarisk or arhar (*cajanus flavus*) stalks, resting on mango, ním (*melia azadirachta*), or mohwa (*bassia latifolia*) timber joists. Separate thatched sheds are erected for cattle and farm servants according to requirements.

Class C. lives in the poorest description of hovel. At best it is a single-roomed thatched mud cabin, with a lean-to at one end for the cattle. In the Trans-Jumna tracts, the walls of the houses of this class are often made of the rough stones, with which a large portion of the surface of that tract is covered. Not unfrequently the whole structure is a fragile erection of wattles (without dáb), with some thorny branches strewn on or stuck in the ground around it.

Scores of ruined proprietors or their descendants live in houses which were once comfortable, and even pretentious, residences, and which are crumbling about the heads of the occupants for want of means to repair them; and scores of others, having reached a still lower level, inhabiting hovels under the shadow of the ruins of the ancient home of the family, glad to be allowed to till, as mere *ascripti glebæ*, the soil of which they and theirs were the owners not so very long ago.

Cattle.—The average number of cattle owned by cultivators will be seen from the accompanying tabular statement. Agriculturists of the better class also keep cows for breeding purposes and for the supply of milk and ghi or clarified butter.

The ordinary agricultural bullock of this districts is of a poor description, and costs from Rs. 6 to Rs. 18 per head.

Grain is seldom expended as cattle food; chaff, *karbi* (the stalks of *holcus sorghum* and *spicatus*) and coarse cotton cake, produced at home, form the usual food. A small quantity of the coarsest description of salt or salt earth is used as cattle medicine.

The better classes of agriculturists seldom or never sell the produce of cows. That of buffaloes is disposed of, a good animal producing Rs. 30 per annum in this way.

Grain Produce.—The surplus grain produce, *i.e.*, after payment of rent, is expended, 1st, on seed; 2ndly, on the household consumption, and for guests and entertainments; 3rdly, on wages of labourers; 4thly, on purchase of necessaries; and 5thly, on payment of debt; or, if there be no indebtedness, is lent out at interest, or sold to purchase extra vessels for the household or ornaments for the women.

Indebtedness.—Of 100 agriculturists in this district, I believe 90 to be more or less indebted. Of these perhaps 60 are able to keep their heads above water, save under the pressure of several successive bad seasons; and the remaining 30 are hopelessly involved and utterly at the mercy of their *bania.*

The indebtedness of the 60 who are not hopelessly involved may be put on an average at about 35 per cent. of their net income.

N.B.—The statements sent up with this reply were found to be too incomplete and inaccurate for reproduction or compilation.

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2. The income and expenditure, property and debts, &c., as well as the condition of the agriculturalists, whom I selected as exemplar cases for my inquiries, are given in the statements which follows this report.

3. From each proprietor, and tenant with rights of occupancy, I have inquired the quantity of land under cultivation and its outturn, with cost of cultivation, rental assets, Government revenue and cesses. Then I calculated the profits from which the following expenditure is incurred:—Maintenance of family, consisting of males and females;* articles of food, with cost for each family; clothes, with costs. These costs were regulated agreeably to the condition of each family (*vide* para. 8 of this report). The costs has been included in diet expenses. The remaining expenses, viz., charity, repairs of houses, pay of establishment, &c. have been shown under miscellaneous expenditure.

For ascertaining the property of each, I inquired into the following points, *i.e.*, cash, value of ornaments, grains, fodder, and other house furniture. I have also entered the number and description of each man's houses (in the statement), and their value has also been inserted according to their condition.

The debts were then inquired into, with reasons as to why they were incurred.

There are no grazing lands in this district; when the cultivation is over the cattle graze in the fields.

4. In stating the real fact of the outturn of the crops, the proprietors of the land always hesitate and

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* With other expenses as detailed in accompanying statement.

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try to conceal the truth. They also hesitate to mention their poverty, prosperity, and other household affairs. In making such inquiries they get alarmed, and think that some tax is to be imposed upon them, or the rent of their lands is to be enhanced. Therefore they conceal their respective status, and exaggerate their debts. Besides this, the management of income and expenditure of the different families depends on the ability of their respective heads. Some can make good arrangements and are more economic, while others are proud and extravagant, and spend more than their caste people. They pay no heed to their income. Some family consists of more members than others, hence its expenditure is comparatively more. Some family is more respectable, and to maintain its respect it has to incur heavy expenses. The expenses of lambardars are generally more than those of tenants and co-sharers. Consequently, it does not follow that all families possessing equal quantity of land, or containing equal members, will incur equal expenses. It remains for me now to explain how far I have ascertained the accuracy of the entries made in statements I. and II.

5. It became necessary for me to make inquiries on the following points:—

I.—Outturn of crops, which the landholders try to conceal.

II.—Cost of cultivation, exclusive of the cultivator and of his family.

III.—Expenses for the necessaries of life, *i.e.*, dieting, clothing, and miscellaneous.

IV.—House and other properties.

V.—Debts, with their causes.

6. As regards outturn of crops, there are four kinds of soil in this district, viz., már, kabar, parwa, and rakar, each being divided into three classes.

The following table will show the outturn of each bígha of the above soil:—

Soil.	Rate per Bígha.		
	1st Class.	2nd Class.	3rd Class.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Már - -	8 0 0	6 0 0	4 0 0
Kabar - -	6 0 0	5 0 0	3 0 0
Parwa -	5 0 0	4 0 0	2 8 0
Rakar - -	3 0 0	2 0 0	1 8 0

The above average outturn per bígha has been found after consideration of the outturn of a prosperous year,—a comparative drought—and also of the outturn given out by the cultivators themselves. It has also been checked with the rentals entered in the settlement papers, and contrasted with the customary rental of the village. The kharif and rabi outturns of each cultivator were inquired into. The average outturn given by me nearly tallies with them.

7. To ascertain the cost of cultivation, I have inquired fully into the following particulars, viz., price of plough and bakkar, price of bullocks, of kharif seeds, and wages for cleaning and weeding the fields for kharif cultivation, as well as the price of seeds for rabi sowings, and wages for reaping the rabi crop. The average of the above cost is shown in the table below:—

Name of Agricultural Implements.	No.	Cost.			No. of Years for which the Implements last.	Average Cost per Year.		
		RS.	A.	P.		RS.	A.	P.
Juá - - -	1	0	8	0	4	0	2	0
Haris - - -	1	0	8	0	2	0	4	0
Akuri - - -	1	0	4	0	1	0	4	0
Dáuri bakhar - -	2	0	8	0	2	0	4	0
Lor do. - -	1	0	8	0	3	0	2	8
Mijhauna - - -	1	0	1	0	1	0	1	0
Datua - - -	2	0	2	0	1	0	2	0
Khaulia - - -	1	0	2	0	4	0	0	6
Rási - - -	1	0	0	3	1	0	0	3
Panehti - - -	1	0	1	0	1	0	1	0
Chari (with bamboo) -	1	0	2	0	2	0	1	0
Phár (of iron) - -	1	0	4	0	1	0	4	0
Páns (of iron) - -	1	1	4	0	2	0	10	0
Kirora (of iron) - -	2	0	2	0	1	0	2	0
Repairs of ploughs and bakhar	—	—			-	0	1	3
Total - -	—	—			—	3	0	0

The sowing of már and kabar lands is more costly. A pair of bullocks, from Rs. 70 to Rs. 100, is required for ploughing. Inferior bullocks cannot plough the már and kabar soil, but in parwa soil a pair of bullocks, from Rs. 40 to Rs. 60, might answer for ploughing purposes. The tenants with rights of occupancy generally keep bullocks of Rs. 50 a pair, but tenants at will plough their fields with bullocks of Rs. 30. The maximum time for which a bullock can work is 10 years, and the minimum time is six years. If the price of a pair of bullocks be fixed at Rs. 80, and if they work for eight years, the average cost per year would be Rs. 10. Again, if the price of another pair of bullocks be Rs. 60, and it could work for six years, the average cost would still be Rs. 10 per annum. From the above circumstances it can fairly be inferred that the average cost of a pair of bullocks per annum would be Rs. 10. Generally the cultivators borrow money (from money lenders) when purchasing bullocks, and pay interest at the rate of Rs. 2 per centum per mensem, in addition to *dharta* (premium) of one anna in the rupee; so the additional cost for a pair of bullocks may be put down at Rs. 2.8.0 per annum, the total cost being thus Rs. 12.8.0 per annum. Sixty bíghas of the parwa soil might be ploughed with one plough, whereas 40 or 50 bíghas of the már and kabar soil might be ploughed with one plough. To ascertain the quantity of seed shown, 50 bíghas have been taken as a limit ploughed with one plough. Of this 50 bíghas, two fifths, or 20 bíghas, are kharif, and three fifths, or 30 bíghas, are rabi lands.

The average cost of sowing seed is as follows:—

Kharif Sowings.

	Bíghas.	Per Plough.		
		RS.	A.	P.
Weeding of cotton at 1 rupee per bígha	5	5	0	0
Cost of cotton seed at 32 seers per rupee, 2½ seers being sown in a bígha	5	0	6	3
Cost of juár seed at 30 seers per rupee, 1 seer being sown in a bígha -	10	0	5	4
Múng, sown with juár, at 16 seers per rupee, 4 chittacks being sown in a bígha - - - - -	10	0	2	6
Urd, sown with cotton seed, at 16 seers per rupee, 4 chittacks being sown in a bigha - - - - -	5	0	1	3
Kodon, sán, tíl, arhar, kakun, and sama, 5 pie per bígha - - - -	5	0	2	0
Total Rs. - -		6	1	4

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The cultivator and his family themselves reap, thresh, and winnow the kharíf grain, and bring them home (from the fields) :—

Name of Grain.	Quantity of Seed sown per Bígha.	Rate per Rupee.	Price.	Average per Bígha.	Price of Seed for 30 Bighas.	Cost of Reaping.
	M. S. C.		R. A. P.	R. A. P.	R. A. P.	R. A. P.
Wheat -	0 15 0	20 seers	0 12 0	—	—	—
Gram -	0 15 0	20 „	0 10 0	—	—	—
Alsi -	0 6 0	12 „	0 8 0	—	—	—
Barley -	0 20 0	32 „	0 10 0	—	—	—
Total	—	—	2 8 0	0 12 0	22 8 0	11 4 0

The average price of rabi seed per bígha is 10 annas, but generally the cultivators borrow the seed on condition of their repaying the same with an addition of 25 per cent., hence the average per bígha is shown at 12 annas. Accordingly the price of seed for 30 bíghas is Rs. 22–8–0. The reaping of the rabi outturn cannot be managed by the cultivators themselves; they have to engage labourers. If the labourers are so strong that three men can reap one bígha a day, they each get 2 annas, but if the labourers are not strong, and four men reap a bígha in a whole day, their wage is 1 anna six pie per man. Six women generally reap a bígha in one day, so they earn an anna each. Although the wages are not paid in cash, but in kind, still the price of the sheaves allowed to the labourers seldom exceed 6 annas per bígha. This gives the total cost of reaping 30 bíghas, Rs. 11–4–0. The remaining work of stacking the grain in the barn and of threshing and winnowing it, and then of carrying the same to their home, is all performed by the cultivators and their family; and if the latter consists of a few members, a labourer is engaged for a short time for winnowing purposes, the cost of which has been put at an average of 1 rupee per cultivator.

The cost of cultivation, exclusive of the labour done by the cultivators and their families, is shown below:

	RS. A. P.
Average price of plough and bakhar -	3 0 0
Average price of a pair of bullocks -	12 8 0
Average cost of cultivating 30 bíghas kharíf land - - -	6 1 4
Average cost of 30 bíghas of rabi land	34 10 8
Total Rs. - -	56 4 0

Dividing this (Rs. 56–4–0) by 50 bíghas, the average cost of cultivation per bígha is Re. 1–2–0, which of course does not include the labour of the cultivator and his family. This calculation has been shown in the statement, as no cultivator could give a clear information of the cost of cultivation exclusive of the labour of the cultivator and his family.

8. Cost of the necessaries of life include the following items:—

(1.) *Diet expenses*, viz., for grain, salt, oil, gúr, and tobacco (for all), and milk and ghí for men of high family. In the year 12 festivals are observed, viz., Kuár, Dassehra, Diwáli, Deothán, Shankrant, Shiuratri, Holi, Sawan, Janam Ashtami, Anant Cháudás, Ashtomi (in the month of Chait), Ashtomi (in the month of Kuár), and Akhti. During these festivities rich food is prepared and distributed even to the servants. This cost is included in diet expenses. Hospitality is also observed. So the diet expenses put down in the statement is not much if the number of each family and their respectability be taken into account.

(2.) *Clothing.*—Children up to two years are not (regularly) supplied with clothing; up to four years they remain naked; after this age the girls wear ghangaria and pharia. Up to six or seven years the annual cost of clothing children is 12 annas or one rupee. In the cold weather they generally sleep with their mother or other relatives, hence no extra charge is incurred for covering.

When the boy is above four years he puts on an angochha, and, according to the state of the family, he is allowed other clothes. Some boys are allowed waistcoat, cap, and shoes. The cost of clothing of grown up men and women differs according to their status of life. That of the two classes of cultivators (superior and inferior)—men, women, boys, and girls —is shown in the table below:—

SUPERIOR.

Men.

Description of Cloth.	No.	Price.	Average Cost per Year.
		RS. A. P.	RS. A. P.
Pagri - -	1	2 0 0	0 8 0
Angarkha - -	2	1 4 0	1 4 0
Bandi - -	2	0 12 0	0 12 0
Dhoti - -	2	2 0 0	2 0 0
Pichaura or chadra	1	0 12 0	0 12 0
Ruída angá -	1	2 0 0	1 0 0
„ paijama -	1	1 0 0	0 8 0
Liháf (quilt) -	1	1 8 0	0 12 0
Gadelá - -	1	1 0 0	0 8 0
Shoes - -	1 (pair)	1 0 0	1 0 0
Total -	—	—	9 0 0

Women.

Description of Cloth.	No.	Price.	Average Cost per Year.
		RS. A. P.	RS. A. P.
Lugrá - -	2	1 8 0	1 8 0
Lahangá - -	2	4 0 0	4 0 0
Dhoti - -	2	1 8 0	1 8 0
Choli - -	3	0 12 0	0 12 0
Khor - -	1	1 0 0	0 8 0
Liháf (quilt) -	1	1 12 0	0 9 4
Gadelá - -	1	1 4 0	0 6 8
Churi - -	—	—	0 6 0
Shoes - -	1 pair	0 8 0	0 8 0
Tikli, comb, and surmadani, &c.	—	—	0 6 0
Total -	—	—	10 8 0

BOYS.			GIRLS.		
Description of Cloth.	No.	Price.	Description of Cloth.	No.	Price.
		RS. A. P.			RS. A. P.
Angochha -	2	0 12 0	Pharia -	2	1 0 0
Angá - -	2	0 12 0	Ghangaria -	2	1 0 0
Cap - -	2	0 2 0	Shoes and churi.		0 8 0
Shoes - -	1 pair	0 6 0			
Total -	—	2 0 0	Total -		2 8 0

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INFERIOR.

MEN.

Description of Cloth.	Number.	Price.	Average Cost per Year.
		Rs. a. p.	Rs. a. p.
Angochhá - - - - -	1	0 6 0	0 6 0
Dhoti - - - - -	2	1 0 0	1 0 0
Shoes - - - - -	1 pair	1 0 0	1 0 0
Pichhorá - - - - -	1	0 8 0	0 8 0
Khor - - - - -	1	1 0 0	0 8 0
Dhoria - - - - -	1	1 0 0	0 8 0
Total -	—	—	3 14 0

WOMEN.

Description of Cloth.	Number.	Price.	Average Cost per Year.
		Rs. a. p.	Rs. a. p.
Lugrá - - -	1	0 8 0	0 8 0
Lahangá - -	1	1 12 0	1 12 0
Dhoti - - -	1	0 8 0	0 8 0
Choli - - -	2	0 4 0	0 4 0
Shoes - - -	1	0 6 0	0 6 0
Churi - - -	—	—	0 2 0
Khor - - -	1	1 0 0	0 8 0
Total -	—	—	4 0 0

BOYS.

	No.	Rs. a. p.	Rs. a. p.
Angochá - -	2	0 12 0	0 12 0

GIRLS.

	No.	Rs. a. p.	Rs. a. p.
Phará - -	1	0 6 0	0 6 0
Ghangariá - -	1	0 8 0	0 8 0
Churi - -	1	—	0 2 0
		Total -	1 0 0

The cost of clothing as above given, has been obtained from the proprietors and cultivators.

Under *miscellaneous expenditure* has been shown those charges which are incurred in addition to dieting and clothing; and considering the circumstances of the people, I do not think the charge is heavy.

Property and House Furniture. — The people generally hesitate to give out the cash and ornaments in their possession,—nay, many persons have concealed grains too, and did not state the full quantity in store. But the number and price of cattle shown in the statement may be accepted as correct. The description and value of houses are also trustworthy.

Debts.—The description of debts, as given by the proprietors, is not considered by me to be trustworthy, nor have we any data to verify their statements, especially as the inquiry was made in such a short time that it was impossible for me to obtain *bahi-khatas* and debts from the mahájans of each village,—so that the true state of the debts would have been brought to light. However, the amount of debts entered in the statement was according to the information received from the people.

The Famine Commission in question 9 have inquired the total amount of debts of the agricultural population, and the proportion which their debts bear to the total income. In my opinion it would not be judicious to base the debts of the whole district on the debts of the ten mauzas inquired into, as they cannot be relied upon. But I will show below the debts and income of these ten villages with their proportions :—

Debts of Proprietors.

No. of Proprietors.	Total Debts.	Total income.	Remarks.
89	Rs. 56,469	Rs. 50,033	The debts exceed the income by $\frac{1}{8}$ and Income : debts : : 1 : 1·12.

Debts of Tenants with Rights of Occupancy.

No. of Tenants.	Total Debts.	Total Income.	Remarks.
81	Rs. 10,846	Rs. 21,743	It is evident that the debts of the tenants are nearly half of their income. Income : Debts : 2 : 1.

STATEMENT OF INCOME and EXPENDITURE, PROPERTY and DEBTS of AGRICULTURISTS in the JALAUN DISTRICT.

Example.	Nature of Tenure.	Area cultivated.	INCOME.			*Expenditure.*			Profit.	*Maintenance of Family.*					Savings (difference between Columns 16 and 21.)	PROPERTY.										Debt.	Remarks.
			Total Value of Produce.	Miscellaneous Income.	Total Income.	Cost of Cultivation.	Government Revenue.	Total.		Number of Family.	Diet Expenses.	Clothing.	Miscellaneous.	Total.		Cash.	Value of Ornaments.	Grain Stock.		Fodder, &c.		Value of House Furniture.	*Live Stock.*		Total Value.		
																							Number of Cattle.	Value.			
			10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		26		27	28	29	30	31	34
		Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Mnds.	Value.	Mnds.	Value.			Rs.	Rs.	Rs.	
1	Landowner	334	2,033	A. 168	2,201	267	406	673	1,528	1 man - 2 women 1 child 4	165	50	69	284	1,244	194	200	311	621	—	—	400	11 bullocks - 2 cows 7 buffaloes 2 ponies	746	2,161	—	A. Sale proceeds of cattle - Rs. 60 Ditto of ghi - 108 168
2	Do. -	219	1,324	B. 36	1,360	157	282	439	921	2 men - 1 woman 1 child 4	160	60	76	296	625	197	100	81	163	—	—	400	7 bullocks - 1 buffalo	330	1,190	—	B. Sale proceeds of ghi Rs. 36
3	Do. -	52	234	C. 84	318	28	87	115	203	1 man - 2 women 3	127	30	5	162	41	—	50	37	75	20	4	15	2 calves - - 1 pony (hires bullocks for ploughing purposes).	12	156	D. 50	C. Invalid pension (Military Department) at Rs. 7 per month. D. Marriage expenses incurred in previous year.
4	Do. -	75	471	—	471	74	133	207	264	2 men - 3 women 3 children 8	235	50	8	293	9 deficit	—	12	—	—	20	4	10	2 bullocks - 1 buffalo.	48	74	E. 800	E. Debt incurred in the marriage of two daughters.

No. II.

Example.	Nature of Tenure.	Area cultivated.	INCOME.			*Expenditure.*			Profit.	*Maintenance of Family.*					Savings (difference between Columns 12 and 17.)	PROPERTY.										Debt.	Description of House and Out-offices.		How the Surplus has been disposed of	Remarks.
			Value of Produce.	Miscellaneous.	Total.	Cost of Cultivation.	Rents paid Zamindars.	Total.		Number of Family.	Diet Expenses.	Clothing.	Miscellaneous.	Total.		Cash.	Value of Ornaments.	Grain Stock.		Fodder, &c.		Value of House Furniture.	*Live Stock.*		Total Value.					
																							Number of Family.	Value.						
			6	7	8	9	10	11	12	13	14	45	16	17	18	19	20	21		22		23	24	25	26	27	28		29	30
		Acres.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Mds.	Value.	Mds.	Value.	Rs.		Rs.	Rs.	Rs.	*Description.*	Valur.		
5	Occupancy tenant.	35	320	36	356	63	120	183	173	1 man - 1	36	12	8	56	117	1	16	16	32	—	—	30	2 bullocks - 2 buffaloes	142	220	50	1 kutcha-pucka house, 9 rooms, no out-office.	50	(1.) Pilgrimage to Jagarnath. (2.) Funeral obsequies of his wife (deceased).	A. Sale proceeds of ghi.
6	Do. -	15	145	B. 74	219	27	54	81	138	2 men - 2 women 1 child 5	106	15	9	130	8	—	10	—	—	—	—	52	2 bullocks - 1 buffalo	84	140	C. 400	1 kucha house, 12 rooms. 1 out-office, kutcha.	51	—	B. Sale proceeds of ghi and vegetables. C. Debt incurred in the marriage of 2 daughters.
7	Do. -	45	387	—	387	80	143	223	164	3 men - 2 women 1 child 6	150	36	8	194	30 deficit	—	30	—	—	50	10	10	2 bullocks - 2 buffaloes -	70	120	D. 200	1 kucha house, 5 rooms, no out-office.	50	—	D. Debt incurred in the maintenance of a large family.
8	Do. -	22	198	E. 100	298	40	71	111	187	1 man - 2 women 2 children 5	104	20	3	127	60	—	—	—	—	—	—	4	2 bullocks - 1 cow	40	44	F. 100	1 kucha house, 4 rooms, no out-office.	20	Marriage expenses	E. Profits from sale of wheat, flour, dál, &c. F. Debt incurred in the marriage of his daughter.

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North-Western Provinces and Oudh.

Munshi Zahid Hussain.

Jaunpur.

As to the ordinary economic condition of such agriculturists generally they may be divided into three classes; (1) the well-to-do who do not work with their own hands but employ hired labour entirely; (2) the middle class who work with their own hands and also occasionally employ hired labour; and (3) the poor who work with their own hands merely. These for the most part live from hand to mouth, and are in a kind of servitude to usurers who let them have food and raiment only, but appropriate all the results of their labour. Generally cultivators grow or make all their own necessaries; but some necessaries connected with agriculture and their households they are compelled to buy. To the former belong implements of ploughing, reaping, sowing, irrigation, which altogether do not cost more than about Rs. 6 on an average for each cultivator, and to the latter belong clothes and condiments or tobacco. The cost of clothes is on an average about as follows:—

For a male cultivator of the well-to-do class—

	Rs.		Rs.	a.		Rs.
Clothes	- 12	his wife's clothes	- 8	0	his child	- 1
Shoes	- 1	Miscellaneous	- 0	8		
Tobacco	- 3					
	16		8	8		

For a male cultivator of the middle class—

	Rs.	a.		Rs.	a.		Re.
Clothes	- 5	8		3	14	child	- 1
Shoes	- 0	8	Miscellaneous	- 0	4		
Tobacco	2	0					
	8	0		4	2		

For a male cultivator of the poorest class—

	Rs.	a.		Rs.	a.	
Clothes	- 2	4	his wife's clothes	2	2	child
Shoes	- *Nil.*					
Tobacco	0	12				
	3	0				

As regards the kinds of houses occupied by cultivators in this district, they live in kutcha houses with tiled or flat roofs; the poorest class, however, live for the most part in thatched houses. The houses of the well-to-do alone have outhouses separate from the dwelling-house, and generally speaking their houses are surrounded by enclosures, but the houses of the poorest class never are. The dwelling houses have but two or three rooms with a verandah, and those with enclosures have one or two rooms in the enclosure used as outhouses. The well-to-do and even the middle classes of cultivators have in addition to oxen for the plough, cows and buffaloes, and some even have horses and camels, but the poorest classes have not even a sufficiency of plough-cattle, having to borrow from their neighbours who are better off. The surplus income is usually expended; (*a*), in marriages and funerals, or in (*b*), litigation. Indebtedness is as a rule caused by improvident expenditure in marriages, and funerals, in litigation, in paying interest and compound interest, and by loss of cattle and adversities of season.

I cannot even hazard a conjecture as to the proportion which their indebtedness bears to the average income of cultivators, but as far as I can ascertain about 60 per cent. of agriculturists are in debt, and about 35 per cent. of the indebtedness is inherited from their ancestors and 25 per cent. is personal.

Mr. Spedding.

Gorakhpur.

I give a few notes on the position of the cultivator as regards—

1st.—His food.
2nd.—His household property.
3rd.—His dwelling-house.
4th.—His debts.
5th.—His clothing.

11. 1st.—As regards his food, the Gorakhpur people are essentially rice eaters. Bread is not consumed to any great extent. Ordinary cultivators in the cold weather eat marua cakes and boiled kodo. For vegetables they eat the shoots of the gram and "susna," a sort of clover which grows on the banks of tanks. They also eat the shoots of mustard (sarson) and kesári dal. The last is said to be very innutritious. They have a proverb "chár din kesári kháe, upar chár kos najae"; that is to say, a man who eats kesári for four days cannot walk four kos at the end. They also collect a weed called "bahua," which grows in the wheat fields, and boil it down as vegetables. In the hot weather they eat cakes of jaukerai—that is, barley and peas grown together. They cook these cakes either on an iron plate (tawa) or in the ashes of a cowdung fire. The first they call "roti," the second "bhauri." They also sometimes cook in the following way:—After making the dough generally of jaukerai or gojaí flour, they work it up into long rolls. Then they take an earthen pot and put a little water in the bottom, and over it some arhar stalks, on which they lay the rolls, which are cooked by the steam from below. Sometimes they put some "dal" in the centre of the roll. This kind of roll they call "pita," when without dál it is called "para." These "pitas" are generally eaten by all Hindus, particularly Kayasths, on the "dawat puja," the third day after the feast of the Dewali.

In the rains they eat a kind of bread known as "mahwar." In the evening they soak some mahua in water with gram, peas, or linseed. Next morning they crush them all together and make a cake of the paste. They also sometimes eat a sort of pudding called "latta," which is made of mahua, linseed, opium seeds, and ground gram (sattu) soaked and crushed up together. The very poorest people make a kind of bread called "makain," which consists of the husks of arhar ground up and mixed with a little flour. During the rains the poorer classes also eat a coarse bread made of mango kernels (*ám-ki-gutli*). This they call *koeli-ki-roti.* In this season they also eat a dish called matjawar. They boil curds with water, and when it is partially cooked put in a little rice or kodon. In the hot weather they soak barley all night in water and next day strain and partially dry it. Then they husk it in a mortar (okli) and parch it as the bharbhunjas do. This they call "bahuri."

When the rabi and kharíf grains are ripening they pick and parch the partially ripe ears or pods. That from gram, peas, and arhar is known as "horha;" that from barley and wheat in the rabi, and tangun and sáwán in the kharíf, is known as "unu."

Sometimes they make small balls of dough and boil them in a pot with dál;" these they call "dalpitti." They also sometimes boil them in milk, when they are called "dudhpitti."

The villagers call dál generally "paiti." When it is boiled up with vegetables (ság) they call it "ság paiti."

The villagers use the following plants as ság in the cold weather:—Bathua, sprouts of gram (chana), sprouts of peas (kirao), susna, sprouts of kesari, flowers of the konhra gourd. In the hot weather they get no ság. In the rains they get karamua, surwari, uma, gadhepurnia. About the end of the rains they collect and parch the grain of the bhatwans.

In the hot weather they collect the bark of the cotton tree (semar) and crush it and extract a sort of white powder, which they mix with flour and bake. They also use the roots of several marsh plants which they dig out of the dry beds of the lake and tanks; such are the bhasihr, paunár, siki, kaulgatta, tal makana, ginni, and bera. From the jungles they collect the seed of the sál tree, the root of a plant called ganti, the fruit of the tendu tree. They also get a long white root called the ratár.

Poor cultivators and day labourers generally eat thrice a day—once in the early morning before they go to work (this is called the "níhári") and again in the middle of the day, which they call "dopaharia," and in the evening, which they call "sanjhagia." Such a man will eat in the morning a little parched grain (bhunja); at mid-day the cakes known as "bhauris" or parched grain flour (sathu) mixed up with water or parched half ripe ears or pods (norha); at evening he will eat bread, dál, and rice, and vegetables.

Cultivators fairly well-to-do eat a little parched grain (bhunja) in the morning and bread or dál and rice with vegetables, both at mid-day and again in the evening.

The low Hindu tribes, such as Chamars, Khattiks, Dharkars, &c., sometimes eat a little pig's flesh. They will also eat secretly the flesh of dead cattle. Similarly, the Muhammadan cultivators, such as Dhunias and Julahas, eat goat's flesh. All Hindus will eat fish, which is plentiful throughout the district. In particular Mallahs, Khewats, and Pásis regularly catch them for food. Koeris and Agarwala Baniyas will not eat fish or flesh.

The oil extracted from sarson, lahi or rai, tira, opium, kusum or burre is used in cooking vegetables. The oils from linseed, mahua, rehnri (castor-oil) are used only for lamps. The oils from opium seed or kusum (safflower) are considered particularly good for making the kind of cakes known as "puris." For this purpose they are even preferred to ghí.

When the sugarcane is being ground in the mill (kolhu) the labourers and the cultivator's family and friends drink the raw juice (kacha ras). They also eat the gur, rab, chota doma, tema, shakar, chini, misri, khaur, burra, which are products in various stages of the manufacture. A favourite food for labourers in the hot weather is "gattas," which are little balls of gur sprinkled over with a few grains of til (sesamum) or ramdana.

Poor cultivators and labourers eat the following sweetmeats which they buy from halwais:—Gattas (gur and til or ramdana seed), lai (made of parched grain and gur sold in balls), lirna, made of gur, gram flour (besan), and bitter oil (karua tel). They also eat most of the ordinary sweetmeats, with this difference, that in these sweetmeats for poor people gur is used instead of chini and oil for ghí.

Poor people also eat the following vegetables:—kohra, lauki, bathua, taroi, ninwa, sathputia, the stalks of the ghunyan or arwi. They also consume potatoes, carrots, phut, suthini, kakari, penthul, onions, lahsun, (garlic), mircha (capsicums), turmeric (haldi), karaila, bhanta, ramtoroiya, sem, kira, kharbuza, tarbuza, ganji.

As for relishes, they eat a sort of mango pickle called katai, which is made up of garlic (lahsun), mint (podina), salt and capsicums with slices of mango.

The following cooking vessels are found in most homes of cultivators and labourers. The very poorest mostly use earthen vessels: such as hawria, kondhas patki, parai, mitia, &c. The better class have brass vessels, the thali for making dough and eating dál and rice, lotah for drinking, tashli (a broad saucer), batuli and batula for water, gaghra for drawing water, katora, abkhora. Of iron vessels there are the tawa (griddle), karahi (for cooking vegetables, &c.), kalchi (a spoon), bujangi (an iron cooking pot), dál (for bringing water). A man who cultivates 10 bíghas will have vessels of sorts worth Rs. 8 or Rs. 10. He will have a grindstone (chakki) worth 10 annas, a pestle and mortar (musal and okli) eight annas, two or three beds (kalia) worth five or six annas each, a granary made of wicker or mud (dehri kolla), some reed mats, some baskets and a kind of box (pitara), grain measures (sai, paili, &c.), a grindstone (sil, lorha) for grinding curry, some ropes. Among tools he will have a garasi for cutting fodded and a khurpi spud for weeding, besides his plough, harrow, &c.

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North-Western-Provinces and Oudh.

Mr. Spedding

Gorakhpur.

Nothing is more remarkable in this district than the steady increase in the number of tiled houses. Dr. Buchanan notes that in some places prejudices continue against erecting them, and they are considered unlucky. This idea seems to have quite passed away. It is now usual to find in all parts of the district that a cultivator holding 10 bíghas or more has a tiled house with the walls made of mud. Masonry houses are only used by mahájans or very large zemindars. The poorer cultivators or day labourers live in miserable thatched huts. In many cases there are no walls; hurdles made of brushwood or arhar stalks are used instead. Such huts are very liable to destruction by fire, which is common on windy nights in the hot weather. The house of a tolerably well-to-do cultivator consists of an enclosure with rooms all round. There is no door, a bamboo hurdle takes its place. Besides the rooms occupied by the owner and his family, there is a house in which the cattle are kept at night, and generally two others, one for chaff and the other for cowdung fuel. Outside there is an enclosure for cattle, and a shed in which they are fed during the day.

Debt.—The best native authorities whom I have consulted are of opinion that between 90 and 95 per cent of the agricultural population are in debt. It is impossible to give an accurate estimate of the proportion of their indebtedness generally as compared with their annual income. These debts are usually classified by natives as—

(*a*) "Beng," advances for seed.
(*b*) "Biahi," for marriages.
(*c*) "Bardahi" for purchase of cattle.
(*d*) "Khawai" for food and other household expenses.

A great proportion of the small cultivators borrow their seed. The rate of interest is siwai or 25 per cent., or when the security is bad, deorha or 50 per cent. In a bad year even well-to-do cultivators borrow their seed. Last spring in the Deoria tahsíl I found that most of the men who had planted sugarcane had mortgaged the standing crop for seed and food-grain. During the cold weather, I saw, as I marched through the tahsíl, at nearly every cane mill agents of Barhay mahájans collecting the gur. The ploughman or harwaha class are, as a rule, so involved in debt that they can never hope to clear themselves. Haidar Husain Khan, a very intelligent zemindar, tells me that he has 50 harwahas who owe each on an average Rs. 60 or 70. I do not believe this is much overstated. Mr. Wynne's estimate of such a man's income gained by his own labour and that of his family is Rs. 59-6-8, which is possibly a little above the average. On this showing the ploughman class would on an average be indebted to the extent of one year's income.

Everyone who has watched the progress of the district since the mutiny notices increasing extravagance in the agricultural class. This is borne out by a comparison of Dr. Buchanan's notes with existing facts. This extra expenditure is incurred principally on weddings and funerals, and on clothes, vessels, and jewellery. The expenditure on weddings is enormously disproportionate to income. A well-to-do cultivator (say) holding 30 bíghas thinks nothing of spending Rs. 300 or more on a wedding. The improvement in dress is very noticeable. Before the mutiny English cloth was rarely if ever worn by the cultivating class. The facts I shall give further on will show the present state of things.

The cultivator disposes of his surplus savings in one of three ways; he hoards them, or lends them, or buys jewellery. As far as I can learn the practice of lending grain on usury at sowing time, and for food between the harvest, is increasing and extending to classes lower down in the social scale. The investigations which were made for the purpose of assessing the license tax, and some inquiries which I made myself last November regarding the seed grain supply, conclusively proved this. It is agreed on all hands that the jewellery supply is increasing. In Salempur Majhauli pargana, after the cane and poppy harvest,

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wandering jewellers go all over the country and make up ornaments in the villages.

As to clothes.—I have had a rough census taken of 500 individuals, of all classes, ages, and sexes, with the following result:—

75 per cent. wore native cloth only.
15 „ „ English and native cloth.
10 „ „ English cloth.

The average value of the cloth worn was:—

	country		English
Men,	Rs. 2,		Re. 1–12.
Women,	„ 3,	„	Rs. 2–14.
Children.	„ 1,	„	Re. 0–12.

Men who wear country cloth possess usually not more than three and not less than two cloths.

Those who wear both English and native have between five and three, and those who wear English alone between ten and four cloths or garments. As a rule, the dhotis worn by both men and women are native cloth. The head covering (márat) is usually English long-cloth or nainsukh, worth from 2 to 3 annas a yard. The chadar or mirzai is commonly made of the same material. During last year the following was the value of English and native cloth brought into the city of Garakhpur.

English cloth Rs. 3,27,324, 82 per cent. on whole.
Native do. „ 69,193, 18 ditto.
3,96,517

Besides this a considerable amount of cloth is made within municipal limits.

I now give balance sheets of several cultivators.

No. 1. Beni Madho Paure of Joth Behuria, pargana Bhowapur, cultivates bighas 8–15–1. His family consists of two men, three women, four children, in all nine persons. He has one plough.

Income.

Season.	Crop.	Amount under cultivation.	Produce per Bigha.	Total produce.	Selling price at Harvest.	Price.	Total.
		B. b. d.	M. s. c.	M. s. c.	M. s. c.	Rs. a. p.	Rs. a. p.
Kharif - -	Sáwan - - -	2 17 10	4 0 0	11 20 0	1 20 0	7 10 8	36 14 7
	Bhadain rice - -	1 3 7	8 0 0	9 13 9	0 20 0	18 10 8	
	Kodon - - -	0 5 13	5 0 0	1 16 8	1 0 0	1 6 4	
	Arhar - - -	0 18 7	5 0 0	4 23 8	0 20 0	9 2 9	
Rabi -	Jaukerai (barley and peas)	1 15 10	8 0 0	14 8 0	1 0 0	14 3 2	116 6 1
	Wheat - - -	4 8 11	7 0 0	34 19 9	0 16 0	86 3 11	
	Gram - - -	0 18 7	5 0 0	4 23 8	0 20 0	9 2 9	
	Linseed - - -	1 2 0	2 0 0	2 8 0	2 13 0	6 12 3	
				Miscellaneous income	Labour - -		5 0 0
					Fees at harvests -		2 0 0
					Grand Total - -		160 4 8

His cattle consists of 2 bullocks.
„ 3 cows.
„ 3 calves.

Agricultural and Domestic Expenses.

Agricultural Expenses.

	Rs. a. p.	Rs. a. p.
Rent at various rates - -	13 6 0	
Seed - - - - -	6 0 0	
Weeding - - -	1 0 0	
Irrigation - - -	1 0 0	
Reaping and threshing -	2 0 0	
Ploughman—One man for four months at Rs. 1–8–0 per month - - - -	6 0 0	
Replacing cattle - -	3 0 0	
Repairs of ploughs - -	1 12 0	
Fees to barber and dhobi -	1 12 0	
Fees to parohit - -	0 2 0	
		36 0 0

Domestic Expenses.

	Rs. a. p.
Food, average 6 pies per diem - -	101 4 0
Clothes - - - - - -	7 4 0
Vessels - - - - - -	3 0 0
Grand Total expenditure - -	147 4 0
Ditto income - -	160 4 8
Surplus of income over expenditure -	13 0 8

He possesses the following property:—

	Rs.
Jewellery worth - - - -	12
Brass vessels - - - - -	6
Clothes - - - - - -	12
Agricultural implements - - -	5
	35

	Rs. a. p.
His debts (contracted in three years) are—	
Borrowed for his father's funeral - -	25 0 0
And for rent and food - - -	55 0 0
	80 0 0
He was sued for this and gave a bond for Rs. 125 in discharge of the original debt, with costs and interest - -	45 0 0
Present debt therefore -	125 0 0

His House.—He has a tiled dwelling-house 30 feet long and 26 feet broad. There are four rooms and a courtyard inside. He keeps his cattle in this house, and he has in addition two sheds—one for fuel (gaen tanla) the other for chaff (bhusaula).

His Grain.—He has urd grain in his house at present. He lives now by labour or borrows a little from his baniya.

His Clothes.—He wears a pagri, a mirzai, a dhoti, and a chadar, all of native cloth:—

Pagri 2½ yards at 2 annas a yard.
Chadar 4 „
Two dhotis 8 „
Mirzai 2½ „

His Food.—In the cold weather he and his family eat sáwán, kodo, marua, maize tangum, and a little bhadain rice. In the hot weather he eats jaukerai and arhar. To pay his kharíf rent he sells some rice, kodo, and sáwán; to pay his rabi rent he sells wheat, gram, and linseed. He has one milch cow which gives a quarter seer of milk daily. His children drink it. He grows some gourds on his thatch, and in the spring gets bathua from his wheat fields. He sometimes buys from Koeris chaurar, and marsa. He grows a little arwi near his house. He uses as fuel cowdung and arhar. The manure of his cows during the rains he puts on his field.

No. 4.—Janki Sentwar, of Rasálpur Jangia, parguna Haveli. His family consists of three men, four women, one child; eight in all. He cultivates bíghas 14–10–0 with two ploughs.

Season.	Crop.	Amount under culti vation.	Produce per Bígha.	Total produce.	Selling price at Harvest.	Price.	Total.
		B. b. d.	M. s. c.	M. s. c.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Kharíf -	Bhadain rice - -	10 15 0	8 0 0	86 0 0	0 20 0	172 0 0	190 12 0
	Cane - - -	0 15 0	10 0 0 gur.	7 20 0	0 16 0	18 12 0	
Rabi -	Wheat - - -	3 0 0	7 0 0	21 0 0	0 16 0	52 8 0	58 10 0
	Linseed - - -	1 0 0	2 0 0	2 0 0	0 13 0	6 2 7	
						Grand Total - -	249 6 7

His cattle consists of four bullocks.

His miscellaneous income.—Nothing admitted, probably his family make at least Rs. 10, by weeding, cutting, &c.

AGRICULTURAL AND DOMESTIC EXPENSES.

Agricultural expenses.	Rs. a. p.
Rent Rs. 2 per bígha - -	29 0 0
Seed - - -	33 0 0
Weeding kharíf - -	10 0 0
Irrigation - - -	6 0 0
Replacing cattle - -	2 0 0
Repairs of ploughs, and fees to village servants - -	3 0 0
Parohit - - -	1 0 0
Preparing gur and cutting cane -	5 0 0
Fees to barber and dhobi -	3 0 0
Total Rs. - -	92 0 0

Domestic expenses.	
Food at six pies per diem -	90 0 0
Cloth - - - -	16 0 0
Vessels, average - -	2 0 0
Repair of house - -	1 0 0
Weddings, funerals, &c., average	15 0 0
Total Rs. - -	124 0 0
Total expenditure -	216 0 0
Total income - -	249 6 7
Balance - - -	33 6 7

He possesses the following property:—

	Rs. a. p.
Agricultural implements -	5 0 0
Vessels - - - -	4 0 0
Clothes - - - -	6 0 0
	15 0 0
He owes - - -	30 0 0

He borrowed it for a wedding this year.

His house.—He has one thatched dwelling-house, 30 feet long and 26 feet broad. He keeps his cattle in his house at night, and has one small shed in which they feed during the day.

His grain.—He has no grain in his house store, but he has enough of rábi grain remaining to keep him on till his bhadin comes on.

His clothes.—He wears one pagri 18 yards country cloth, worth Rs. 1–4–0; angocha two yards English matapalan, two annas a yard; one chadar four yards English longcloth, three annas a yard; one pair shoes, worth 2½ annas.

His food.—He eats the same grain as No. 1.

No. 6.—Ilahi Iraki of Larh, tahsíl Balia, pargana Salempur Majhauli. He cultivates bíghas 6–15–0. His family consists of one man, two women, three children; six in all. He has one plough.

Income.

Season.	Crop.	Amount under cultivation.	Produce per Bígha.	Total produce.	Selling price at Harvest.	Price.	Total.
		B. b. d.	M. s. c.	M. s. c.	M. s. c.	Rs. a. p.	Rs. a. p.
Kharíf -	Kodon and arhar -	2 0 0	5 0 0	10 0 0	1 0 0	10 0 0	36 0 0
	Bhadoi rice - -	1 0 0	8 0 0	8 0 0	0 20 0	16 0 0	
	Marua - - -	1 0 0	10 0 0	10 0 0	1 0 0	10 0 0	
Rabi - -	Wheat - - -	0 15 0	7 0 0	5 10 0	0 16 0	13 2 0	45 2 0
	Barley - - -	2 0 0	8 0 0	16 0 0	0 20 0	32 0 0	
		Miscellaneous income.					
		Carrying grain with his pony - - - - -					35 0 0
		Grand Total - - - -					116 2 0
		His cattle consist of two bullocks one pony.					

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AGRICULTURAL AND DOMESTIC EXPENSES.

Agricultural expenses.

Rent, at Rs. 2-8-0 per bígha	16 14 0	
Seed, Kodon and arhar	1 8 0	
„ Rice	2 0 0	
„ Marua	0 4 0	
„ Wheat	2 0 0	
„ Barley	5 0 0	
Ploughman, 1 man for 8 months at Rs. 2 per month	16 0 0	
Carpenter and blacksmith, 12 annas each	1 8 0	
Replacing cattle	2 0 0	
Weeding kharíf	6 8 0	
Irrigation	7 0 0	
		60 10 0

Domestic expenses.

Food, at 6 pies per head	48 0 0	
Clothes	6 0 0	
Vessels, earthen	0 8 0	
		54 8 0
Grand total expenditure		115 2 0
Ditto income		116 2 0
Balance		1 0 0

He possesses the following property :—

Vessels	5
Jewellery	7
Agricultural implements	3
Clothes	7
	22
	Rs.
He owes	65
Consisting of price of a pony	8
For food and clothes within two years	57

His house.—He has one tiled dwelling-house with four rooms. He lives in two, keeps his cattle in one, and his chaff in the fourth.

His clothes.—He wears :—

One murát, four yards English nainsukh, at four annas a yard.

One mirzai, 1½ yards ditto markin, at 4½ annas a yard.

One dhoti, four yards ditto longcloth, three annas a yard.

One lungi, 2½ yards country cloth, 2½ annas a yard.

One pair of shoes cost three annas.

No. 7.—ESTIMATED INCOME and EXPENDITURE of a MAHTO or cultivator in easy circumstances supporting (say) a wife, one son married, one unmarried, one daughter, a brother with his wife, one son married and a daughter; in all 10 persons.

Extent of farm, 30 bíghas worked with five ploughs.

Cr. Income.

Season.	Crop.	Amount under cultivation.	Produce per bigha.	Total produce.	No. of seers per rupee.	Price.	Total.
		B. b.	M. s.	M. s.		Rs. a. p.	Rs. a. p.
Kharíf	Mash	2 0	4 0	8 0	33	9 11 2	
	Kodo	1 10	3 24	5 16	64	3 6 0	
	Rice broadcast	11 0	7 37	Uncleaned 87 7 Cleaned 48 25	32	60 12 0	78 13 2
Jhurrun	Rice transplanted	6 0	10 36	Uncleaned 65 16 Cleaned 37 24	25	60 2 6	60 2 6
Rabi	Wheat	5 0	8 7	40 35	28	58 5 0	
	Do. and barley gojai.	3 0	5 16	16 8	42	15 7 0	
	Peas and do. Jaukerai.	3 10	4 20	15 30	54	11 10 8	
	Urhur	1 10	6 0	9 0	28	12 13 9	
	Linseed	1 0	1 32	1 32	15	4 12 9	
	Masur	1 0	3 0	3 0	42	2 13 0	
	Gram	1 0	3 36	3 36	36	4 5 0	
	Mustard	1 10	4 8	6 12	18	14 0 0	
	Opium	1 10	0 8	0 11¾	—	56 4 0	
	Poppy seed	—	—	—	—	2 4 0	
	„ leaves	—	—	—	—	0 12 0	
	Surgarcane	1 0	16 gur.	6 0	14	45 11 3	
	Vegetables and tobacco.	0 10	—	—	—	8 8 3	
						—	237 10 5
Price of seven head of cattle sold in the year						70 0 0	
Profits from loans of grain						45 0 0	115 0 0
Total credit						—	486 10 1

The 30 bíghas are suffered to be thus distributed, ek-fasla, one-half bígha opium, 1 sugarcane, 1½ mustard, 2 mash, one-half vegetable and tobacco, 1½ broadcast rice, 6 transplanted ditto, 5 wheat; do-fasla 3 bíghas broadcast rice, followed by wheat mixed with barley, 3½ ditto, followed by barley and peas, 3 ditto followed by masur, linseed, and gram, 1½ kodo sown amidst arhar.

From the gross produce in columns 4 and 5 the amounts given for cutting and carrying have in all cases been deducted. These come to about 46 seers per bígha for wheat, 43 for rice, and one in 16 for the minor crops.

The rates given in column 6 are not the bazaar rates, but those which a cultivator obtains immediately or shortly after the harvest.

It is supposed that 10 cows are kept, the annual offspring of which, deducting casualties, will amount to the number stated.

Grain lent at sowing time is repaid with 25 per cent. (sawai) or 50 per cent. (deorah) interest at harvest time. A mahto generally exacts 50 per cent.

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Dr. Agricultural expenses.

	Rs. a. p.	Rs. a. p.
Seed for 2 bíghas, mash	0 7 0	
„ 1 „ ½ kodo	0 2 0	
„ 11 „ broadcast rice	5 8 0	
„ 6 „ transplanted	2 11 6	
„ 5 „ wheat	8 0 0	
„ 3 „ „ and barley	2 10 12	
„ 8 „ ½ peas „	1 8 0	
„ 1 „ ½ arhar	0 1 11	
„ 1 „ linseed	0 10 8	
„ 1 „ masur	0 6 0	
„ 1 „ gram	0 12 0	
„ 1 „ ½ mustard	0 6 0	
„ 1 „ ½ opium	0 5 0	
„ 1 „ sugarcane	2 0 0	
„ ½ vegetable and tobacco	1 8 0	
		27 0 3
Labour.		
Three ploughmen at Rs. 18	54 0 0	
Weeding poppy and vegetables	3 6 0	
Weeding and sowing miscellaneous	6 6 0	
Irrigating five bíghas wheat at Rs. 10	3 2 0	
Irrigating three bíghas poppy, sugar-cane, &c., at Rs. 3	9 0 0	
Collecting opium, one half bígha	3 0 0	
Manufacturing the gur	8 0 0	
		86 14 0
Miscellaneous.		
Hire of sugar mill	2 4 0	
Earthen vessels for sugar	1 0 0	
Barhai for mending sugar mill	0 8 0	
Ahir for watching cattle	1 0 0	
Abwab; fees to village servants	7 1 4	
Fees to Brahmins at harvest	1 0 0	
		12 13 4
Land rent three bíghas, poppy, &c., at Rs. 4-8-0	13 8 0	
Land rent six bíghas jhurrun at Rs. 2-2-0	12 12 0	
Land rent five bíghas wheat at Rs. 2-2-0	10 10 0	
Land rent one-half bígha mustard at Rs. 2-0-0	3 0 0	
Land rent 11 bighas dofaslas, at Rs. 1-12-0	19 6 0	
Land rent 3½ bíghas ekfasla kharif at Rs. 1-4-0	4 6 0	
		63 8 0
Total agricultural		190 3 7

Summary.	Rs. a. p.
Total agricultural returns	361 10 1
„ „ expenses	190 2 7
Balance on 30 bíghas	171 7 6
„ bígha	5 11 6

The three ploughmen employed will look to the feeding of the bullocks. They and the four male members of the family able to work will perform the main agricultural operations unassisted, viz., ploughing, sowing, harrowing, threshing and transplanting the rice. In cutting the pods and collecting the opium they will be assisted by the female members of the family and by outsiders.

To irrigate the wheat, eight outsiders per diem at one anna three pie for five days will be required. The crop is irrigated but once.

To irrigate the poppy, sugarcane, &c., from wells, three outsiders at one anna three pie per diem, watering one-fourth bígha a day, will be required for 12 days at a time. To water the crop three times they will be required 36 days in all.

Weeding the poppy, &c., performed solely by outsiders, generally women, 12 of whom receiving nine pie a day, will weed a bígha once; 72 will therefore be required to weed the three bighas twice.

Cutting the poppy pods and collecting the opium, 10 men and women working from morn to noon can operate on half a bígha once; 90 hands accordingly required to operate on one and a half bigha three times. Deducting servants and members of the family, 36 outsiders will be required, receiving one anna three pie per diem.

The village servants will probably be eight in number the (chamar) gorait, chaukidar, hajjam, dhobi, lohar, barhai, kahar, and ahir. They will receive, it is supposed, nine seers at each harvest.

One press will suffice for two bíghas of sugarcane. The hire will be shared by two neighbours. It takes a fortnight to manufacture the price of one bígha.

Dr. Expenditure.

Description.	—	Seers per rupee.	—	—
Food.	M. s. c.		Rs. a. p.	
Atta, wheat	29 10 0	27	15 0 0	
Rice	21 0 0	28	30 0 0	
Dal	13 0 0	33	15 12 0	
Salt	1 5 0	4½	10 0 0	
Oil	0 22 8	4	4 0 0	
Gur	1 0 0	14	2 13 0	
Tobacco	—	—	4 0 0	
Vegetables and seasoning	—	—	5 0 0	
Pan on festivals	—	—	2 0 0	
				119 3 0
Clothes.		Rs. a. p.		
Men: 15 dhotis at		0 12 0	11 4 0	
5 pagris		1 4 0	6 4 0	
5 mirjais		0 10 0	3 2 0	
8 angochas		0 4 0	2 0 0	
6 chadars		1 4 0	7 8 0	
5 pairs shoes		0 4 0	1 4 0	
Women: 8 saris		0 15 0	7 8 0	
4 do. girls'		0 9 0	2 4 0	
4 chadars of nainsuk		2 0 0	8 0 0	
5 razais every second year, Rs. 1-4-0; total Rs. 6-4-0, annual			2 1 0	
4 ceremonial dresses for the women, Rs. 3-8-0; total every third year, Rs. 14-0-0, annual			4 10 8	
3 blankets every second year at Rs. 0-14-0; total Rs. 2-10-0, annual			1 5 0	
2 toshaks every third year at Re. 1-8-0; total Rs. 3-0-0, annual			1 0 0	
2 eksutti daris every third year at Rs. 2-4-0; total Rs. 4-8-0, annual			1 8 0	
Jewellery cost about Rs. 140. Renewing and repairing at 14 per cent.			19 9 7	
Household vessels cost about Rs. 26 Renewing and repairing at Rs. 25 per cent.			6 8 0	
House, original cost Rs. 70-0-0, repairing annually			9 0 0	35 1 7

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Spedding.

Gorakhpur.

Description.	—	Seers per rupee.	—	—
			Rs. a. p.	Rs. a. p.
Furniture: 2 muchias (straight backed stools)			2 0 0	
2 beds of Saku at Rs. 1–8–0			4 8 0	
5 beds of bamboo bansutwas at Rs. 0–12–0			3 12 0	
Repairing and renewing at 16 per cent.			—	1 11 4
Earthen vessels			—	0 7 8
Agricultural Implements.				
		Rs. a. p.		
5 ploughs at		2 0 0	10 0 0	
1 harrow (henga)		1 4 0	1 4 0	
2 rakes (panjha)		0 2 0	0 4 0	
4 kodalis		0 10 0	2 8 0	
5 baskets for sowing (ora) at		0 1 0	0 5 0	
5 sieves (chalna)		—	0 2 0	
Repairing and renewing, exclusive of ploughs, at 25 per cent.			—	1 2 0
Cattle: 10 bullocks at Rs. 12 each			120 0 0	
Renewing ditto, every eighth year			—	15 0 0
Abwab, Amihmani or feast to relations			2 0 0	
Pujah three times a year at Rs. 2			6 0 0	
Teohars, six in the year at Rs. 1–8–0			9 0 0	
A marriage or a funeral at Rs. 50 to 70 once a year			12 0 0	29 0 0
Total			—	261 5 4
Summary.				
Cr. Total returns			—	476 10 1
Dr. Expenses, agricultural			190 2 7	
Food			119 3 0	
Clothing			59 10 11	
Miscellaneous			92 6 7	461 6 1
Balance Cr.			—	15 4 0

The atta will have been ground and the rice cleaned by the women of the household; one seer in 28 is allowed for loss by grinding.

The village mochi will also give five pairs of shoes in return for the hides. The house will be partly tiled and partly thatched; the walls wholly of mud.

The kanchas and other baskets required will be made by the household itself.

Besides this, presents in money and clothes will have been made to relations, but these gifts balance each other in the long run.

No. 8.—ESTIMATED INCOME and EXPENDITURE of a small cultivator cultivating six bíghas with one plough and supporting a wife, one son of 18, one of 14, and a daughter of 10 years, in all four persons besides himself.

Season.	Crop.	No. of bíghas.	Produce per bígha.	Total produce.	No. of seers per rupee.	Price.	Total.
		B. b.	M s.	M. s.		Rs. a. p.	Rs. a. p
Kharif	Mash	1 0	4 0	4 0	33	4 13 7	
	Rice broadcast	2 10	7 37	19 32 uncleaned 11 15 cleaned	33	13 12 7	
Jarhan	Do. transplanted	1 0	10 36	10 36 uncleaned 6 11 cleaned	26	9 10 6	
Rabi	Wheat	1 0	8 7	8 7	29	11 4 5	
	Do. and barley	1 0	5 16	5 16	43	5 0 4	
	Peas and barley	1 0	4 20	4 20	55	3 4 4	
	Mustard	0 10	4 8	2 4	19	4 6 9	
	Linseed	0 10	1 32	0 36	16	2 4 0	54 8 6
Earnings of Family.					In grain. M.	In money. Rs. a. p.	
Sowing kharíf and transplanting jarhan, three months					16	13 4 0	
Cutting kharíf and carrying ditto. 15 days, at 8 seers					3	3 12 0	
Do. jarhan ditto. 10 do.					2	2 10 8	
Do. rabi ditto. 30 do.					6	7 8 0	
Miscellaneous, *e.g.* weeding, collecting opium, building mud walls, six months					—	11 0 0	38 2 8
Cattle, two head sold every three years					—	6 0 0	6 0 0
Total credit					—	—	98 8 8

The six bighas will be thus distributed, ek-fasla 1 bigha mash, 1 bigha jarhan, 1 wheat, ½ mustard; dofasla 1 bígha broadcast rice followed by wheat and barley) gojai), 1 bígha ditto followed by peas and barley (jaukerai), ½ bígha ditto followed by linseed.

The rates in column 6 differ somewhat from those given in the preceding statement, as the small cultivator will be obliged to sell in a cheaper market than the mahto.

The earnings include the profits from gleaning.

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North-Western Provinces and Oudh.

Mr. Spedding

Gorakhpur.

Dr.	Rs.	s.	p.	Rs.	a.	p.
Seed 2 bíghas broadcast rise -	2	0	0			
1 do. transplanted do. -	0	7	6			
1 do. mash - -	0	13	6			
1 do. wheat - -	1	9	7			
1 do. do. and barley -	0	13	6			
1 do. peas and do. -	0	10	8			
10 do. mustard - -	0	2	0			
10 do. linseed - -	0	5	4			
				6	4	1
Irrigating 1 bgíha wheat, 14 outsiders at Re. 0-1-3 - -	1	1	8			
Fees to village servants (Jeura) -	2	8	0			
Repairing plough, &c. - -	0	12	0			
				4	5	8
Land-rent 2 bíghas 10 biswas do-*fasla* at Re. 1-12-0 - -	4	6	0			
1 do. do. transplanted rice Rs. 2-2-0 - -	2	2	0			
1 bígha wheat Rs. 2-2-0	2	2	0			
10 do. mustard at Rs. 2	2	0	0			
1 do. mash Re. 1-4-0	1	4	0			
				11	14	0
Total agricultural expenses -				*22*	*7*	*9*

Food.

Description.	Amount. M.	s.	No. of Seers per Rupee.	Rs.	a.	p.	Rs.	a.	p.
Atta wheat - -	6	10	28	8	14	0			
Do. do. barley	10	0	43	9	5	0			
Rice - -	8	11	32	13	7	6			
Dal - -	4	0	33	3	10	2			
Oil - -				1	12	0			
Salt - -	0	21	4½	4	10	8			
Vegetables and seasoning -				2	5	4			
Tobacco - - - -				1	4	0			
Pan on festivals - - -				0	8	0			
							44	12	8

Clothing.

	Rs.	a.	p.	Rs.	a.	p.
1 razai at Re. 1-4-0 - -	1	4	0			
1 blanket - - -	0	14	0			
2 dhotis large, 10 annas each -	1	4	0			
2 do. small, 6 annas each -	0	12	0			
2 angochus, 4 annas each -	0	8	0			
1 pagri, Re. 1 - - -	1	0	0			
2 chaddars, 12 annas each -	1	8	0			
2 saris, 13 annas each - -	1	10	0			
1 sari for holiday wear at Rs. 3-8-0, once in three years -	1	2	8			
1 pair shoes - - -	0	4	0			
				10	2	8
Ornaments, total cost Rs. 18, renewed every four years -	4	8	0			
Household vessels 7, cost Rs. 9, renewed every three years -	3	0	0			
Cattle, 2 bullocks, cost Rs. 20, renewed every eight years -	2	8	0			
				10	0	0
Abwab puja - - -	2	8	0			
Six teohars, at 8 annas each -	3	0	0			
A funeral or a marriage at Rs. 15, once every seven years -	2	2	1			
				7	10	1
Total -				95	1	2

Summary.

	Rs.	a.	p.	Rs.	a.	p.
Cr.—Total return - -				98	11	2
Dr.—Agricultural expenses -	22	7	9			
Food - -	44	12	8			
Clothing - - -	10	2	8			
Miscellaneous - -	17	10	1			
				95	1	2
Balance Cr. -				3	10	0

In the article food, the number of seers per rupee is given, not at the bazar rate, but at that given in the statement of return, as the amount will simply be deducted from the agricultural produce.

The house will be built of mud or matting and will cost the owner nothing but his own labour for repairs.

Generally a cultivator, such as is here described, is in debt to his zemindar. In that case not only will the balance of the profit shown above be swallowed up, but he will be continually incurring fresh debt.

No. 9.—Estimated Income and expenditure of a ploughman with the same family as in Part II.

—	In Grain. M.	In Grain. S.	In Money. Rs.	In Money. a.	In Money. p.	Total. Rs.	Total. a.	Total. p.
Wages as ploughman - -	—		18	0	0			
Earnings of wife and children	—		—					
Sowing kharif and transplanting jarhan, three months -	17	0	14	4	0			
Cutting and carrying kharif, 15 days - - -	3	0	4	0	0			
Ditto ditto jarhan, 10 days	2	0	2	10	8			
Ditto ditto rabi 30 „	6	0	7	8	0			
Miscellaneous labour during remaining six months -	—		13	0	0	59	6	8
Dr. Food.								
Atta, wheat - - - -	4	0	5	12	6			
Do. do. and barley mixed -	10	0	9	4	7			
Rice - - - -	4	0	5	0	0			
Masur, lentils - -	5	0	4	10	5			
Dal - - - -	4	0	4	13	7			
Salt - - - -	0	10	2	3	7			
Oil - - - -	—		0	14	0			
Seasoning - - -	—		0	6	0			
Tobacco - - -	—		0	12	0			
Liquor - - -	—		3	8	0			
						37	4	8
Clothing.								
3 Blankets at 14 annas in two years - - -	—		1	5	0			
4 Dhotis large and small at Rs. 0-7-6 - - -	—		1	14	0			
2 Pigris in 3 years at 12 annas	—		0	8	0			
2 Angochas - - -	—		0	8	0			
2 Saris - - -	—		1	8	0			
1 Chadar - - -	—		1	0	0			
1 Sari and lengha for holiday wear at Rs. 4, once in 4 years	—		0	8	0			
						7	3	0
Household vessels 5, costing Rs. 4 every third year -	—		1	5	4			
Ornaments, costing Rs. 2-13-0 every fourth year - -	—		0	11	0			
Pujah - - -	—		0	12	0			
Teohars, six in the year—money spent in drink -	—		1	14	0			
						4	10	4
Total expenditure -	—		—			49	1	12
Balance -	—		—			10	4	8

This balance is only nominal. The interest on the debt for the marriage swallows it up. The class whose expenditure is here detailed go into debt for every fresh marriage or funeral, and work out the amount. Generally, indeed, Rs. 18 wages are not given at all, but in its stead only sufficient food to support life while the debt is being worked out.

The earnings include in all cases the profits from gleaning.

HAP. I. QN. 9.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Crooke.

Gorakhpur.

Mr. Crooke, Gorakhpur.—Complete accuracy as to the average amount of food consumed by the labouring and cultivating classes cannot be expected. It is only people who buy every day a fixed ration of grain from a bania who can state accurately the amount which they consume. The agriculturist, on the other hand, who has grain in his house, is not so careful in fixing his daily ration; while his granary is full he eats as much as he wants, and in hard times, or just before the harvest comes in, goes on short-commons. Again, in most families, of this class the food is all cooked together, and the family eat at the same time. Under these circumstances no regular classification of rations is possible. Further than this, in endeavouring to fix the average ration of the labouring and poor agriculturist class, there is a varying disturbing element for which it is very difficult to account. Beyond the grain ration these people consume a very large quantity of vegetables, which vary in amount and quality at the different seasons. Hence, the actual weight of the grain ration is not a satisfactory indication as to whether they obtain the requisite amount of nutriment.

The grain ration for adult men.—All the inquiries I have made go to show that, in this district, the maximum ration of grain, under the most favourable circumstances, is one Gorakhpuri seer weighing 100 Gorakhpuri pice, or corresponding to 1·13 Government seers, or 2·9 lbs. This seems to be the maximum weight of cooked grain in the form of bread, boiled rice, dal, &c. that a working agriculturist will eat in cold weather.

My inquiries show that, about 40 per cent. of this ration is consumed in the forenoon and 60 per cent. at night. But it is most important to remember that, except in the case of large cultivators, the forenoon ration does not include any regularly cooked food, except the "básì" or fragments which have remained over from the last evening's meal, which are eaten in the morning as the labourer starts to his work.

The estimate for purely cooked food will not apply to what is usually the case, the cultivator or labourer eating "sattu," that is, parched gram, barley, &c. ground, or "chabena," that is, parched grain in the forenoon. It is generally admitted that, in this case, the cultivator's ration, at the best of times and with the hardest work, will not exceed six chittacks Gorakhpuri weight of sattu and half a seer of grain. That is to say,—

Grain = 0·565 Government seers.
Sattu = 0·423 "
·988

that is, in round numbers, a seer of grain of sorts, Government weight.

It is perfectly clear that this ration of a Gorakhpuri seer of grain per diem is a purely ideal one for the labourer or cultivator here, and rarely, if ever, realised in fact. Respectable natives always lay it down as the assumed maximum ration, because, as I am informed, it is the estimate which they follow in preparing food at large assemblages of their friends and relations, such as at marriage feasts, &c. But in such cases, it is manifest that considerable allowance must be made for wastage, and the estimate is probably framed so as to leave something over for beggars or servants.

From inquiries I find that, at the present time, my own grasscutters, who receive Rs. 4 per mensem, and are certainly much better off than a village labourer, regularly eat 12 Government chittacks of grain per day, out of this 9 chittacks are rice and 3 dal. At current rates this ration, with salt and spices, costs exactly one anna. So the food of these men cost them about Rs. 2 per mensem, or half their wages. Their ration would be—

·75 government seers.
1·92 lbs. avoirdupois.

The average agriculturist's ration is far from being as good as this. From what I can make out, a fair all-round average in ordinary years for a whole family is 9 chittacks government weight per head; that is, equal to ·562 of a government seer or 1·44lbs. avoirdupois of grain, or 5·12 government maunds per head per annum.

This must be understood to be a generally estimate for the whole agricultural proportion, including cultivators and labourers, After working out these figures I compared them with Mr. Moen's estimate for Bareilly (Settlement Report, page 54): curiously enough, they agree exactly with his results for the jail dietary. Now, it has always been admitted that the peasant of Rohilkhand is better fed than his Gorakhpur brother, and this fact may be brought to show that my estimate is an excessive one. The explanation of this is easy. Mr. Moens' estimate is for a population mainly consuming the better class grains, such as wheat, barley, and rice, while mine is for people habitually eating innutritious grains, such as kodon, marua, sawan in the autumn harvest, and barley and peas in the spring harvest. On an average, the Gorakhpur and Rohilkhand peasant probably both eat about the same weight of grain, but the usual food of the latter is probably 25 per cent. more nutritious than that of the former.

It is very difficult to find out exactly what the day labourer (whom it is most important to consider from the famine point of view) eats. In this neighbourhood I find that the masters give their ploughmen 12 government chittacks of any grain available at the time per day and Re. 1 in cash per mensem. On pay like this it altogether depends on circumstances whether he is able to support life fairly, or lives in a normal state of semi-starvation. If he has only himself to provide for, he can keep body and soul together. But if he has a sickly wife or a number of young children, he can only live in the most wretched way. On the other hand, if his wife and children can work for their own support, he struggles on as long as work is available for them. But a drought that stops weeding or irrigation throws him on the parish at once. There are infinite degrees in the position of these men. If he is a chamar, he sometimes gets a pice as a perquisite, or his wife gets a present for acting as midwife, and when labour is scarce of course he takes advantage of it. Just now, when there is a demand for labourers for irrigation, women, who would gladly work for 3 pice per diem at other seasons, are standing out for 7 pice and a meal of parched grain.

As to women's grain diet. It appears that their diet during the irrigation and weeding season is very little, if at all, below that of the men.

As to children. It is impossible to calculate their diet with any accuracy. They generally get something four times a day, and a good deal of their daily food consists of milk.

As to salt. The labourers and poorest cultivators estimate, as a rule, 1 Gorakhpur pice weight per diem. This is, I believe, more than what is used by these people on an average. This class seems to eat more salt, on an average, than those better off. Probably the reason is that they require more to make their vegetables palatable. This amount of salt gives, by my calculations, an all-round average of about 204 grains per head per diem. The jail allowance is only 150 grains. Probably my average is somewhat high. No cultivator regularly weighs his salt. He only puts a pinch or two into his dal to suit his taste. If he takes a pice weight per diem, his annual consumption would be four seers, costing at current rates 13 annas.

As to tobacco, &c. Most adult men smoke more or less. Very few women among the agricuturists smoke. The kahars and mallahs smoke ganja largely. From what I can learn an average cultivator's tobacco bill is about Re. 0-1-6 per menson, or about a rupee per annum.

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Firing costs nothing. A cultivator's food is also supplemented by a little ghi, and in most parts of this district very considerably by fish. Sugar is very little eaten except in the form of sweetmeats at festivals, but the juice of the sugarcane and treacle are largely consumed by the poorer classes in the cold weather and spring months.

Mr. Benett.

Lucknow.

Mr. Benett, after making inquiries in 10 villages, writes:—

A few of the answers obtained are unquestionably accurate. The number of souls to the family, the area of cultivation, the rent, the number of plough cattle and other stock, and the description of house, are all correctly given. I feel less confidence in the return of other sources of livelihood, though that too is probably correct in the majority of instances, and in the statement of debts.

I attach very little value to the accounts given of the actual gross produce, its value in money, the cost of seed, and weeding, watering, and ploughing; while for the expenses of living I almost invariably got one answer,—Rupee 1 per month for each soul in a family for food, and from Rs. 2 to 4 per annum for clothing. I am indeed convinced that it is absolutely impossible to get correct answers to any of these questions by direct inquiry. The people themselves have not the requisite knowledge. They feel, when asked, much as an English peasant might feel if a Sanitary Commissioner were to inquire of him what weight of animal and vegetable food, and what value of liquid he consumed in a year, how much of each he assimilated, and how much he rejected from his system.

When the grain is carried to the threshing floor a number of dues have to be paid out of it, covering a very large share of the expenses of cultivation. The cutters get one basketful in sixteen, and if paid in grain, the labourers get their wages served out to them. The village servants all take their dues from the heap. At one side may be seen a row of miserable old women and beggars, each of whom gets a double handful, for the native on these occasions is very liberal; while, probably, if the grain is of a superior kind, wheat or rice, the servant of the money-lender or the zamindar is present to carry off an equivalent for his interest or his rent. Of the whole crop, the latter is the only item that is commonly weighed. Whatever he can save, the cultivator takes to his house for the consumption of himself and his family. He may have a rough idea of what this weighs, but he certainly never thinks of making an addition of the whole produce.

In the same way with regard to expenses of cultivation. He buys an ox occasionally when he has saved or can borrow the money, but he has no idea of what the average expense per annum on this account comes to. If he keeps a ploughman, as most well-to-do cultivators do, he knows that he costs him Rs. 24 per annum, with an occasional dole of coarse grain; but the occasional labourer he employs on irrigation and weeding is paid sometimes in cash and sometimes in grain, both at various rates; sometimes he exchanges his labour for that given on another day by a neighbouring cultivator; and I am quite sure that however precise an answer he may give, he has only the vaguest idea of what the cost has really been.

It is the same in the matter of food for himself and his family. The greater part is provided by the produce of his own fields, and he keeps no account of what he pays for the remainder.

The houses of cultivators for which I got returns were almost all above the average in position in the community. I proceed to give an analysis of the results of the inquiry of 34 houses:—

	B.	b.	b.
The average area of cultivation per house - - - -	11	15	0
Ditto ditto per soul - -	1	13	0
Average of souls per family - -	7	0	0
	M.	s.	c.
Average produce per bígha - -	6	23	0

	Rs.	a.	p.
Average value of a maund of grain -	2	5	0
Average value of outturn per bígha -	5	3	0
Ditto rent " " -	4	3	0
Ditto expenses " " -	4	0	0
Ditto profits " " -	7	0	0
Annual profits per family - -	80	0	0
Ditto ditto per soul - - -	11	0	0

As these results have no pretensions to accuracy, I have not worked them out with minute exactness.

Of the 34 families 16 have other property, generally small mango grooves, or assignment for service.

Eighteen are in debt to the amount of Rs. 2,102–2–0. The annual income of these houses is given at Rs. 891–14–5; but as five of the eighteen are in Samesi, where the cultivators will not admit that they have a greater income than about eight annas per soul per annum, it would perhaps be safe to double this.

In three villages, for which the returns were in other respects so inaccurate that I have been unable to use them, 12 cultivators out of 13 were returned as in debt. But the debts were not heavy, and the villages had suffered with exceptional severity from the drought. In the whole district my conclusion is that about 60 per cent of the cultivators are in debt to the amount of about one year's income.

It is impossible to give any vague idea of the condition of the agricultural classes, without discussing a problem of immense intricacy. A few salient considerations are all that I am capable of dwelling on.

In the first place, I have no doubt that the gross outturn is habitually understated. Pandit Davi Parshad, who has had immense experience, gives it as his opinion that in ordinarily good years 12 maunds per bígha is a poor crop, 16 maunds a fairly good, and 20 maunds an exceptionally good, but not uncommon outturn. Mir Fida Ali, the manager of the Raja of Salempur's estates, estimates the produce rather lower, and these estimates correspond fairly with the results of my own experience. Two or three crops of the commoner kinds of the grain, which is the bulk of the food of the agricultural classes,—kodon, juar, Indian corn, millet and arhar,—are raised from the same land in the same year, and the produce is often very heavy. I have seen fields this year where 25 maunds of juár per bígha have been harvested, and where 10 to 15 maunds of arhar may be expected in the spring.

The expenses of cultivation vary with the caste of the cultivator. Seed is the same for all, and the most expensive crop in this respect is wheat, of which a maund is sown to the bigha. The other crops take much less; and allowing that seed is more expensive than food grain, when the cultivator has to apply to a mahaján for it, I do not believe that the average cost of seed exceeds rupee 1 per bígha.

If the cultivator is a Brahmin or a Thakur, he must engage a ploughman for at least six or seven months in the year, at rates varying from Rs. 2 to R 2–8 per mensem. In farms of any size the expense of labour for irrigating, weeding, and gathering in are considerable. In small farms most of these operations can be done by the tenant and his family. I do not believe it possible to make any general estimate of these expenses. The variation on each side of an extensive average would be so great as to deprive the average of all value.

If great and small consume 12 chittacks of grain per diem, and this is everywhere admitted to be a fair allowance, a family of four persons will consume 27 maunds in the year.

NORTH WESTERN PROVINCES AND OUDH.

Mr. Benett.

Lucknow.

I now consider the case of a tenant with family of four souls, holding a farm of five bíghas. His rent is Rs. 21 per annum, for which he will require 16 maunds of wheat, which he can raise from 13 bíghas. He will not probably consume more than the produce of Rs. 2 as food, and 1⅔ bíghas will be left to provide clothes, salt, agricultural instruments, seed, and labour. In my opinion a cultivator of this class would be in a position of what is regarded as moderate comfort, but he would be quite unable to save, and an exceptionally bad harvest, even if far short of total failure, would reduce him to extreme destitution.

The agricultural labourer never has any live stock or any property to supplement his scanty earnings: while agricultural labour is to be had, he is paid at various rates, which on an average, bring him in about Rs. 2 per mensem. He gets 9 pies a day for weeding, and this is generally done by women and boys; for digging or making irrigation trenches, 1 anna per diem; for watering, from 1 anna 3 pies to 2 annas; and when he is paid in kind he gets five or six local seers, that is 4 to 4½lbs. of the coarsest kinds of grain. Employment in the fields cannot be had for more than seven or, at the outside, eight months in the year, and for the other months he keeps himself alive by selling grass when he can,—an occupation at which he may earn 9 pies per diem, or doing jobs on the roads, or in the last extremity eating unwholesome weeds, which do more quickly the work of starvation. He can rarely afford to buy clothes, and keeps himself warm by creeping under a pile of straw. In the late famine in Rae Bareli the straw had been all consumed by the cattle, and the earlier deaths were rather attributable to cold acting on great want, than to direct starvation. Starvation commenced on the day when a heavy rain obviated the necessity of employing labour for irrigation.

To resume: of the whole rural population from 20 to 25 per cent. have some kind of trade. Only a few of these can be considered as even moderately rich, and on the other hand there are not many who live habitually on the border line of starvation. Of the 65 to 80 per cent. who are true agriculturists, more than a fourth are day labourers, and are never far removed from that line. I have selected five bíghas as a farm which will enable an average sized family to live in fair comfort in average years, and keep them from starvation except in times of actual famine. A third of the agricultural population hold farms of more than five bíghas each. Nearly 40 per cent. of the agriculturists, or about 30 per cent. of the whole population, hold farms of a less area than this; and though raised above the utter destitution of the day-labourer, have but at the best a precarious livelihood.

BENGAL.

Ir. Toynbee.

BENGAL.

It is impossible to give a general answer to this question which would apply with any degree of accuracy even to so small a unit of administration as a district, so much depends on the tenures of land, on the caste of the people holding it, on local customs, on harvests and seasons, the pressure of the population on the soil, and a host of other circumstances;—to say nothing of the difficulty of fixing a standard of prosperity or adversity independent of the vast differences in individual opinions. This much may, however, safely be said, that the classes who possess any kind of proprietary rights, or any occupancy right in the land which is duly respected by the landlord, are generally raised above the reach of famine. Many of them are in debt owing to the pernicious custom of the country which entails an expenditure on marriage and other religious ceremonies quite out of proportion to the means of the persons incurring it, and who have generally to borrow at high rates of interest to meet it. But there can be no doubt that within the last few years the ryots of Lower Bengal have, owing to the springing up of the jute manufacture and the high prices of all agricultural produce, taken a great step towards putting themselves on a better and more independent footing. Tenants-at-will and those whose rights of occupancy are not respected even if they possess them, live, it must be confessed, very much from hand to mouth. Similar to that of the last-mentioned class is the condition of the agricultural labouring classes, though in many parts of the country they too have recently been able to force up their rate of wages. If by being in debt it is meant that a Bengal ryot is in arrear with his rent, debt is a very common incident even in districts where the cultivators are known to be prosperous. Indebtedness to the village mahájun and indebtedness to a landlord, when they are not one and the same person, are two very different things. It is impossible to estimate what proportion of the agricultural population is in debt to the former, but it is certainly very considerable in most parts of Bengal. The ryots are as a body uneducated and thriftless, and have not yet learnt to hoard. They are thus constantly borrowing, though the high prices of late years have enabled many of them to shake off to some extent the hold which the mahajuns had over them. In comparison with those of Eastern Bengal, Chittagong, and Orissa, the ryots of Behar are very badly off. Those in the western and central are not so prosperous as those in the eastern districts. Though there has been a general tendency on the part of landlords in Bengal, and especially in Behar, to ignore and encroach upon occupancy rights, yet one of the chief causes of the poverty of the cultivating classes is undoubtedly their own improvidence and their wasteful expenditure on marriage and other ceremonies.

Babu Raj mar Sircar.

The economic condition of the ryot entirely depends upon the number of ploughs he employs. A ryot with one plough can cultivate 12 bigahs on the average.

Holding 12 bigahs, the whole being for tillage. His family consists ordinarily of five members—wife, himself, and three children.

Excluding 1 bigah, which is utilised in sowing vegetables, jute, &c. for his own use—

	Dhan. Mds.	Dal. Mds.	Oil-seeds. Mds.	
Eleven bigahs produce	- 66 +	5 +	1½	
	Rs.	Rs.	Rs.	
The price of which is	- 66 +	7½ +	3	=Rs. 76½

	Rs.	
Rent - - -	18	
Hired labour for weeding	6	
For reaping - -	6	(one maund of paddy per every 11 maunds of the produce, if paid in kind).
Other household expenses	18	
Seed - - - -	9	

He has—

Huts - - -	3	of very small dimensions, one for cooking, one for the cattle, and one to live in.
Bullocks - -	3	
Cow - - - -	1	

	Price. RS.	A.	P.
One brass ghutty - - - -	0	12	0
Thalee (plate) - - - - -	1	0	0
Two earthen pots for water (kulsi) -	0	1	6
Ten ditto handy for cooking - -	0	2	6
Four ditto dishes - - -	0	2	0
Four ditto small pots for keeping salt, oil, &c. - - - -	0	1	0

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NORTH-WESTERN PROVINCE AND OUDH.

Babu Raj Kumar Sirca

Three warm cloth made kanthas for	RS.	A.	P.
the winter - - - -	1	2	0
One pillow - - - - -	0	2	0
Four pieces of cloth - - -	3	0	0
One winter cloth - - - -	0	12	0
Ornaments worth - - -	6	0	0
Stock of grains - - - - -	0	0	0

Marriages are generally contracted by borrowed money.

He has sometimes a debt contracted for purchasing the bullock, seeds, and other materials necessary for cultivation, which is generally soon paid off.

About $\frac{9}{20}$ths or less than half of the agriculturists are indebted.

Mr. Skrine.

I do not hesitate to affirm that in ordinary years the condition of the peasantry in Lower Bengal proper might be envied by the English cottier. An average holding in that province would be rather less than seven acres. An agriculturist's family may be taken to consist of five souls. The value of his produce per annum may be estimated at not less than 15*l.*, and were it not for his improvident habits the surplus would go far towards guaranteeing him from the incursions of famine.

The curse of the people is their indebtedness, *i.e.*, the great majority being entirely in the hands of the middleman, wrongly termed a "money-lender," whose vernacular denomination is "mahájan" or "saúkár."

About two years ago I instituted a series of careful inquiries on this point in the Nuddea District, and published the result in the then existing Government organ, "The Statistical Reporter" (November 1876). As the economic condition of the people of Nuddea closely resembles that of the greater portion of Upper India, Nuddea being admittedly a representative district, I venture to reproduce the result of these inquiries here.

I found that out of a population of 237,000, entirely agricultural, upwards of 75 per cent. were clients of the mahájan. The average yearly indebtedness per client is not less than 7*l.*, including a charge of 2*l.* 10*s.* as interest; the rates at which money or food grain is advanced are simply exorbitant, and the consequence* often is, that not only are all the ryot's savings swept into the "money-lenders" coffers, but the adverse balance continually increases, and the client is fortunate who is not eventually involved in ruin by being compelled to part with his plough, cattle, and homestead.

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* *Rates of interest demanded by mahájans in Bengal.*

1.—On monetary loans for considerable amount covered by good and tangible securities - - - - -	12 to 18 per cent.
2.—On ditto ditto for small amounts on good security - - - -	24 to 30 "
3.—On ditto ditto without security -	37·5 "
4.—On advances without security of food grain for consumption - -	50 "
5.—On ditto ditto for seed - - -	100 "

N.B.—12 per cent. is termed "Company's interest," inasmuch as it was the rate demanded by the East Indian Company for unliquidated commercial balances.

Mr. MacDonnell.

In the Durbhanga District, and generally throughout North Behar, the average ryot (*i.e.*, the head of a family) holds between three and four acres of cultivated land, thus giving something less than three-quarters of an acre per head of the population. This is an important fact as far as the pressure of population on the soil is concerned; and the conclusion I deduce from it is that while in average good years there is still a margin for saving, it is so small a margin that it is often swallowed up by the landlord's demands for arrears of rent, and the money-lender's demands for arrears of interest, not to speak of the ryot's own improvidence, when his purse is not empty, in matters of marriages, ceremonials, &c. An adverse year does not find him with much resources in store from the margin.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nichol.

I offer the following observations regarding the indebtedness of the people.

It is believed that during the past six years a considerable proportion of proprietors and cultivators of the privileged classes have, practically speaking, freed themselves from the burden of indebtedness, and that few, who 10 years ago were solvent, have retrograded, and where they have retrograded it has been due to individual carelessness or want of self-control. At the time of settlement, when sale or mortgage of lands first became possible, and the valuable gift of property and permanency of tenure enlarged the limits of credit, many of those who were indebted had to part with their lands, and a comparative few, thinking their credit inexhaustible, or not believing in the possibility of their lands being sold outright, for a time "plunged."

Those who have struggled and finally emerged from debt, form much of the backbone of the country, and now on the security they can offer, and very frequently without security, can obtain temporary loans at rates varying from 12 to 18 per cent.

In Sir R. Jenkins' report it is mentioned that formerly the rate of interest was higher than it is now (1827). Under Raghoji and Appa Sahib, the general rate on money lent on common security was three and four per cent. per mensem, and never less than two, on the best security, or pledges given to the full amount of the sum advanced, besides a deduction of two, three, and sometimes four per cent. from the amount of the loan.

At the time when he wrote the highest rate was two per cent. on good security, or pledges given. To patels and ryots the terms were commonly two per cent. a month, and two per cent. deducted from the original sum; but to artizans and mechanics the rates were three or four per cent., or even more.

With the increased prosperity of the cultivators and the facilities they now have of taking their own produce into brisk markets where there are European or Bombay native agencies, the formerly almost universal custom of selling their crops before the harvest in advance is fast disappearing. This gradual lessening of the burden of indebtedness, has also been vastly accelerated by the adaptation of the times for paying rent and the Government revenue demand to the harvest times. Formerly the kists were paid four times a year, and generally the cultivator to pay his rent, and the pátel to pay his revenue, had four times a year to apply to the money-lender. Rents as well as revenue are now paid at a sufficient time after the two harvests to free the payers from this necessity.

My own inquiries and Mr. Collaco's knowledge lead me to believe that in the Nagpur and Wardha districts, among the privileged tenants, 5 per cent. are hopelessly involved, and would gladly give up their rights, if by so doing they could start afresh in life free from old debts and claims. Another 30 per cent. are, we consider, more or less deeply involved, but these will struggle, and have fair hopes of freeing themselves within the currency of the present settlement; another 30 per cent. are in debt to the extent of from one to five times the amount of the annual rental of their holdings; and the remaining 35 per cent. are either free or only in the books of the Saucars, because they rather like it than otherwise, thinking that they thus secure a ready support in time of need.

On the whole, among the tenantry there are fewer instances of crushing debt than among the proprietary body, excepting of course the malik makbuzas and the

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CENTRAL PROVINCES.

Mr. Nicholls.

malguzars, who unite money or grain lending with their landholding occupations.

But it must be remembered that the Nagpur and Wardha districts are exceptionally prosperous. Throughout the Nerbudda Valley districts the cultivators are on the whole just as well off as those of Nagpur and Wardha, but there is vastly more indebtedness among the proprietors.

It has been seen that in Chhattisgarh the tenants were, practically speaking, entirely dependent on their landlords for advances, not only for seed grain, but for food grain. The same is almost the rule in Damoh. Bhandara is not very much better.

The rates at which loans are made for food grain are pretty nearly the same all over the Provinces, namely 25 per cent. But the rates for seed grain vary from 25 to 100 per cent. Thus in Nagpur in villages in which there is but little rice cultivation the rate for rice seed grain is 100 per cent., but in parts where rice is the staple it is only 25 per cent; linseed and urad 50 per cent.; wheat, tur, and others 25 per cent. Every cultivator is expected to preserve selected heads of joari for his own seed. If he has to borrow for this, he can return with selected seed, in which case he has to give an additional 25 per cent. by way of user, but if he returns ordinary grain he has to give double or 100 per cent. If cotton seed is lent, the borrower repays in cotton from ⅜ to ½ of a maund of uncleaned cotton for every maund of seed borrowed. This is equal to from 125 per cent. to 200 per cent. A well-to-do cultivator will never borrow cotton seed, but will purchase outright.

As regards the money-lenders, the village Marwaris, especially the later settlers, bear the worst name for trickery, hard dealing, keenness to take advantage of the ignorance of the cultivators, and to turn and twist our courts and laws to their own ends. The best among the lenders are those who are themselves proprietors and who belong to the agricultural classes. These very seldom resort to our law courts.

The worst feature about the grain loans is that the debt is allowed to run on for a long time at compound interest until a time comes when the price of grain is high. Then all at once the creditor presses for settlement, and the grain debt is converted into a money debt at the enhanced current rates, and a bond or a decree is taken for money, which becomes the basis of further operations.

A cultivator who has once emancipated himself from debt will, above all things, shun borrowing grain, for it is immeasurably better for him to borrow cash at from 12 to 18 per cent. and purchase grain for his requirements.

At the lowest rate of user, a grain debt doubles itself in three years. Ordinarily compound interest would not run on cash loans, so the original loan would hardly be doubled in less than six years.

The surplus income of the cultivator is mostly converted into ornaments; but he is glad to lend on interest to his fellow-cultivators. Burying money is still very common, for the remembrance of the former insecurity of life from the Pindhari incursions and of property from the rapacity and extortions of the Bhonsla period, has not altogether passed away. Some say they hide their surplus cash from fear of thieves, others admit that poor relations and importunate religious beggars are still more dreaded. Very little, if any, diminution in the cost of marriage ceremonies has yet resulted, but in the northern districts villagers appear to be very curious to learn the customs and rates of expenditure in other parts of India, and greatly deplore their own inability to proportion such expenses to their individual means and condition of life.

As regards the indebtedness of the landholding classes, I give an exhaustive table, compiled with great care at the close of 1874.

District.	Total Number of Proprietary Heads of Ancestral Estates.	Number and Per-centage of Proprietary Heads of Ancestral Estates not Indebted.		Number and Per-centage of Proprietary Heads of Ancestral Estates in Debt,		Number and Per-centage of Proprietary Heads of Ancestral Estates Indebted in						Total Number of Separate Estates (Mehals) in which Proprietary Rights were conferred at the time of Settlement.	Number of Estates (Mehal) transferred to New Proprietors since the Settlement.	Per-centage of Mehals transferred to New Proprietors.
						Class. I. Indebted in Sums not more than One Year's Jama.		Class II. Indebted in Sums not exceeding Five Years' Jama.		Class II. Indebted in Sums exceeding Five Years' Jama.				
		Number.	Per-centage.	Number	Per-centage.	Number.	Per-centage.	Number.	Per-centage.	Number.	Per-centage.			
Nagpur*	5,510	3,906	71·	1,604	29·	281	4·1	827	15·	546	9·9	2,170	249	11·5
Bhandara	1,255	903	72·	352	28·	87	7·	121	9·6	144	11·4	763	229	30·
Chanda	807	484	60·	323	40·	29	3·5	156	19·3	138	17·2	1,522	69	4·5
Wardha	1,887	1,448	76·7	439	23·3	58	3·	221	11·7	160	8·6	577	25	4·3
Balaghat	1,219	492	40·3	727	59·7	132	10·8	462	38·	133	10·9	386	73	19·
Total	10,678	7,233	67·7	3,445	32·3	537	5·1	1,787	16·8	1,121	10·5	5,418	645	12·
Jubbulpore	1,276	853	66·8	423	33·2	35	2·7	202	15·8	186	14·6	2,282	208	9·1
Saugor*	4,760	3,738	78·5	1,022	21·5	144	3·	480	10·	398	8·5	1,468	165	11·2
Damoh	1,063	767	72·1	298	27·9	25	2·4	134	12·6	139	13·	1,257	51	4·
Seoni	536	341	63·6	195	36·4	28	5·2	108	20·1	59	11·1	603	95	15·7
Mandla	763	616	80·7	147	19·3	78	10·2	43	5·6	26	3·5	527	56	10·6
Total	8,398	6,315	75·2	2,085	24·8	310	3·7	967	11·5	808	9·6	6,137	475	7·7
Hoshangabad	†1,214	367	28·7	847	71·3	68	5·7	189	15·9	590	49·6	609	39	6·4
Narsinghpur	‡950	316	29·9	634	70·1	38	4·2	153	16·9	443	48·9	595	35	6·
Chhindwara	1,396	1,103	76·9	293	23·1	81	6·3	120	9·4	92	7·3	831	24	3·
Nimar	948	532	54·2	416	45·8	99	10·9	166	18·3	151	16·6	456	13	2·8
Betul	948	379	35·8	569	64·2	151	17·	193	21·7	225	25·4	534	134	25·
Total	5,456	2,697	46·5	2,759	53·5	437	8·5	821	15·9	1,501	29·1	3,025	245	8·1
Raipur	1,842	1,065	57·8	777	42·2	243	13·2	452	24·5	82	4·5	3,309	259	7·8
Bilaspur	1,051	668	63·6	383	36·4	141	13·4	211	20·1	31	2·9	2,008	235	11·7
Sambalpur	438	357	81·6	81	18·4	32	7·3	36	8·2	13	2·9	513	15	2·9
Total	3,331	2,090	62·8	1,241	37·2	416	12·5	699	20·9	126	3·8	5,830	509	8·6
Grand total	27,863	18,335	65·8	9,530	34·2	1,700	6·1	4,274	15·3	3,556	12·8	20,410	1,874	9·1

* In these districts some sharers have been included with Malguzars, the families being undivided. Generally, however, Malguzars have alone been shown. † 1,188 ancestral holders. ‡ 905 ancestral holders.

Chap. I. Qn.

Central Provinces.

Mr. Nicholl.

The solvency of the proprietary body was found to be considerably better than had been expected, but still there is much room for disappointment, seeing that at the commencement of this settlement the free gift of Government of proprietary rights, valued at the lowest possible rates and strictly on commercial considerations, was worth three millions sterling, while, viewed as capital and as a solid and enduring basis for credit, its potential value was very far in excess of this amount.

Bapu Rao.

Bapu Rao.—He considers that 15 years ago landholders and cultivators were deeply involved, but that they have gradually cleared off much of the debt. The money-lenders have realised large sums on account of old debts during the past two years. Civil suits for money lent are now less frequent, and the rate of interest, for respectable cultivators and landholders, has become easier. Sales and mortgages of land are on the decrease, whilst claims for possession of land, even of a few poles, are keenly contested. The improvement began from the time of the American war. The cotton of this district was sold at high rates. This was followed by the opening of the railway. For the last two years especially the high rates for agricultural produce and large exports by railway have done much towards the clearing off of old debts. Some landholders and cultivators through individual recklessness are, of course, on the high road to ruin, and still more have money debts bearing high interest; but on the whole the condition of the agricultural classes is much better than before.

It is believed that a large amount of gold has been absorbed in the district by villagers during the past two years. Many particularly wealthy men could be named whose riches are of comparatively recent date. A late honorary magistrate is known to have died indebted; but it is said that he allowed his debt to stand to make people not notice that he had hoarded about half a lac of rupees worth of gold. The late malguzar was on the brink of ruin ten years ago. Although he died in debt to the extent of a few thousand rupees in consequence of his lavish charity, yet he left grain enough to cover most of this in a single payment. Rich cultivators, some of them belonging to the lowest caste, are often met with, but these are individual cases. As a class cultivators have advanced, because crops have been good and rates exceptionally high. If the worst were to happen for two succeeding years, the majority of cultivators would be again in difficulty. They will have to borrow money at high interest. The question arises how is it that they cannot stand two bad seasons. Except our urban population, we had but village communities, and that the institution, though not well defined, still lingers on, is a fact that can be discerned in every village. Under this system the actual cultivator had limited duties and responsibilities. They tilled the land, but the village headman supplied cattle, seed grain, labour for weeding, food grains, and loans for marriages. He made such improvements as he thought best on the village lands. The actual cultivator never rose beyond the position of a landed serf. Recently the actual cultivators have obtained proprietary or occupancy rights, but at the same time they have lost their old claim on the feudal superior; hence wherever the recipients were capable by intelligence, means, and pluck to carry on their agricultural affairs without the aid of others they have thriven remarkably well. But such was not the condition of the majority of the recipients of the boon. They had no capital, education, or pluck, and from time immemorial were habituated to dependence on their landlord for everything. When they were made almost independent of the landlord for agricultural purposes, the good feeling between the classes grew colder, and often feelings of jealousy arose. A few years before occupancy rights were given by Government, a foreign money-lender, the Marwari, had appeared on the scene, and the needy cultivators flew to him for money and grain advances, and an indigenous class of local usurers of the Marwari type also sprang up. It is needless to detail the results of such a state of things. The worst feature in their operations,—which brought almost hopeless ruin to the cultivators,—was the system of selling the coming crops at certain rates fixed at random, not for cash but on account of old debts. As a rule, the cultivators were unable to execute their agreements, or were not punctual in delivery, and had to pay damages, often under decrees of court, at rates often involving the return of several fold what they received. They have since to a great extent recovered, but the causes of their recovery are not permanent. One or two bad seasons would see many reduced nearly to their former condition. They are not yet fitted by education, by the possession of capital, and by pluck to stand alone. The cultivator has still ingrained in his nature habitual dependence on others for capital and other help. He is still credulous and superstitious, and even now cannot understand the necessity of improved modes of cultivation. He still uses the refuse of his farmyard for fuel instead of utilising it as manure. And in our law courts, in comparison with his creditor, he is helpless. If his Malguzar be rich and well disposed towards him, he would still have a chance of tiding over two bad years; but if his Malguzar be involved like himself or be non-resident, or has no sympathies with his ryots, then he cannot help going to ruin. Villages can be pointed out where the cultivators are prosperous, not so much because the seasons have been good and prices high, but because the Malguzar is himself well-to-do, and watches over the interests of his ryots in every respect. On the other hand, villages close to Wardha can now be shown, where the Malguzars themselves being in difficulties, money-lenders have obtained a strong hold on the ryots, or where the Malguzars and ryots not being on good terms, the ryots have to surmount all sort of vexations. But to provide the ideal Malguzar for every village is almost impossible, and therefore the ryots must learn habits of independence. The worst enemy of the ryot is the money-lender, and the land revenue assessment, bad seasons, extravagance and idleness do not contribute to embarass them so much as the system of selling coming crops in advance for money due, not for principal alone, but often mainly for interest. As a rule, the cultivator is patient, industrious, and frugal. He and the members of his family work on during all seasons of the year in or for their fields, and in return they get sufficient produce. They seldom eat meat. Salt, red-pepper (chillies), onions, garlic, turmeric, and oil are their condiments; and a few seers of gur suffices for holidays. As a rule they are temperate. Two dhoties and an occasional pagri and dopatta suffice for each male member of the family, and two saris and four cholies complete the wardrobe of every female member.

Example 1.—A typical instance is Narayan Teli, an occupancy ryot, free of debt, holding 44 acres, of which four are fallow. He has seven grown up persons in his family, three males and four females. He has 15 head of cattle, of which six are bullocks. Last year his produce was worth Rs. 225. The women of his family work on his fields, and during spare times are employed as labourers for other people, earning about Rs. 30, He cultivates about 21 acres in another village, which last year produced crops worth Rs. 90, thus his gross income was Rs, 345.

His expenditure was :—

			RS.	A.	P.
*Joar at 6½ seers per diem	= 10½	Khandies	84	0	0
*Wheat - - -	1	do.	12	0	0
*Pulses - - -	2½	do.	36	0	0
Gur, 22 seers - - - -			5	0	0

* Produce of his own fields, consumed as food at home.

Ap. I. Qn. 9.

Central Provinces.

r. Nicholls.

horgao Rao.

Mr. Imrie.

	RS.	A.	P.
Salt	2	12	0
Oil	18	0	0
Chillies	6	0	0
Onions, garlic, turmeric, &c.	12	0	0
Total	175	12	0

Clothing—	RS.	A.	P.
8 saris	16	0	0
6 dhoties	6	0	0
3 pagris	5	0	0
3 blankets	4	8	0
Cholies	0	12	0
6 pairs of shoes	4	0	0
3 dopattas	3	0	0
Weeding expenses exclusive of the labour of his family	20	0	0
Rent	51	0	0
Total	286	0	0

This cultivator is the head of a prosperous family. He has two brothers as strong as himself. He sold the following produce, which is included in the amount of his income shown above:—

Cotton, worth	Rs. 57
Linseed	„ 9
Kurbi	„ 5
Grass	„ 8
Total	79

There was a surplus income of Rs. 60.

Example 2.—Mannu, an absolute occupancy ryot, has 22½ acres, and is a tenant-at-will for three acres. He is free of debt. In his family of six members, four are grown-up people. He has two plough bullocks and seven head of other cattle. His crop was worth Rs. 178. His expenditure was:—

		RS.	A.	P.
*Joár, 5 seers a day	= 7½ Khandies	56	0	0
*Wheat, 160 seers	= ½ do.	6	0	0
*Pulses	1½ do.	18	0	0
Salt		3	6	0
Oil		12	0	0
Onions, &c.		9	0	0
Gúr		5	0	0
Total		109	6	0

* Grown in his own field, consumed as food at home.

Clothing—	RS.	A.	P.
2 sáris	4	0	0
3 pagris	4	0	0
8 dhoties	7	0	0
4 blankets	3	0	0
Cholies	2	0	0
Wages of boy servant	4	12	0
Weeding expenses	5	0	0
Rent	26	0	0
Total	165	2	0

There was a surplus of Rs. 12 14 0.

Mannu sold cotton worth Rs. 38, linseed worth Rs. 5, and mung worth Rs. 3.

The houses of these ryots are mere huts with one room and a verandah.

There are one or two cattle-sheds close to the dwelling houses. Grain is kept above ground in basket-work stores, thatched on the top. The cost of such a house is under Rs. 25. Every ryot sells produce first to pay rent and pressing debts. Generally there does not remain much to be stored. Cotton and linseed are all sold, and these are the crops which enable a cultivator to lay by some cash, which is generally buried for safety as a provision against bad times. Few cultivators lend money or enter into trade. Expenditure on marriages or for purchase of cattle occur now and then. A marriage costs from Rs. 75 to Rs. 125, and it is mainly for this that recourse is had to the money-lender. If he had only to pay simple interest at 12 per cent. he could often manage to pay off his debt in good seasons; but what keeps him struggling on are the devices of the money-lender, which hardly allow a debtor, when once involved, to free himself.

Note.—The cereals consumed by these two cultivators appear to be greatly over-stated. The probable surplus I calculate at Rs. 50 and that of Narrain at Rs. 125.

Bhorgao Rao.—A cultivator who once gets into debt finds great difficulty in getting out of it. When grain is borrowed it has to be repaid with 25 per cent. in addition some six or seven months after. Failure to deliver on the stipulated date carries with it a penalty of, say, from 50 to 100 per cent., and the cultivator, notwithstanding all his exertions, gets deeper and deeper into debt. They also frequently borrow and give agreements to sell their produce to the lender at very low rates, and in case of failure they are bound to pay the price at double these rates. A case was noticed, a few days ago, in which a Malguzar had received 11 manis five years previously, and had executed a deed for 51 manis. An inquiry into the indebtedness of the Malguzars of this district showed that out of 950 men, 634 were in debt; of the latter, six per cent. had debts equal to one year's jama; 24 per cent. of more than one year's and less than five years' jama; 70 per cent. of more than five years' jama. The highest amount of the debt was 30 times the jama of the village. As regards cultivators, the per-centage of debtors is estimated at from 25 to 30 per cent., and their debts do not run so high, and exceed five years' rent in a very few cases.

Mr. Imrie.—The conclusion arrived at by Mr. Imrie and the Malguzars whom he has consulted is that 80 per cent. of the cultivators of the district are believed to be in debt, between 20 and 30 per cent. hopelessly so. But it must not be supposed that those who are burdened with debt greatly exceeding their annual income are therefore in a wretched state. No depth of debt could make a cultivator live more cheaply than the run of his fellows. His habits remain the same; he spends little in luxuries at any time; his house and fields remain as neat or neglected as it suited the task of their owner in better times. His expenditure at marriages and fairs must be curtailed, and if nothing can help him, at last his fields must be taken away.

Whether he be in debt or not, the economic condition of the tenant remains pretty nearly unaltered. He has a house of mud walls with a tiled roof. It costs from 15 to 20 rupees to build, and needs petty repairs each year as the rains set in. His household may consist of two or three women, and say a couple of children, unable to do any paying work. These do all the household work. At certain seasons hired labour must be employed. This is during the ploughing, sowing, and weeding times, and at harvest, and the time for cutting grass. The growth of the kans grass must be carefully checked.

Hired labourers at these times can earn enough to feed their families. Perhaps a third, sometimes a half, of these come from Bundelkand and the hilly parts of Saugor, the rest are villagers. They are mostly paid in kind, and what is given is not counted in reckoning the gains of the season. It is from what is shown on his threshing-floor that the produce per acre is deduced by the official and the harvest returns by the cultivator. It is still more difficult to calculate his other expenses. Little rice or sugar is produced. These he must purchase at from 5 to 15 rupees, and salt for his family and cattle cost about five rupees a year. He smokes tobacco if he can get it. Fuel is never a heavy item.

The women of the family likely come provided with a many years' store of clothing on their wedding, but even these may have been got through or succumbed to white ants. For the coarser cotton clothing, it is the custom where cotton is grown to have, at a small charge, so many seers worked up in the village, if not in the house. Then there are little contributions to the village temple, to the patwarri and the kotwal, to the baid and the midwife, the barber and the cobbler, the fisherman and the scavenger, the idiot and hunchback, and the yogi and byragi, whom the cessation of the rains has let loose from the city. Then, too, there is the great fair at Rangir or Garhakota, and the annual pilgrimage to the Nerbudda,* if the women of the family have any influence. The offering may be only a handful of grain, but the long journey "of many axles" would be thought an extravagant one in any other country. At least a quarter of the population of the district attend each of these annual fairs.

Mr. Imrie remarks that it would be most difficult to give exactly the income and expenditure of a cultivator who keeps no reckoning of the many small payments he makes and expenses he may incur or of the days for which he gives wages. He sows what he thinks will be the best crop, and he works as the weather allows him, and his expenditure must vary with the weather as his crops do. It never enters his imagination that a poor cotton crop may pay him better than a good crop of joár; or, though one crop sown with another † may shield from blight or frost in January, it may be better policy to keep them apart. The weather is his dictator, and not any thought of a future market price.

Cotton is becoming the most important kharif crop, and a failure of the joár and rice is becoming of less importance.

In conclusion, Mr. Imrie observes that though he considers 80 per cent. of the cultivators to be in debt, and something less than 30 per cent. to an extent exceeding their yearly income, he would put the average indebtedness at less than half the yearly gross returns of their lands. The general indebtedness may be on the increase, but not rapidly. While the cultivators hold their fields, they live in the usual simple way, supplied by their malguzárs with grain when their own store is exhausted. A season of drought increases their debts and reduces many to the condition of labourers, and their indebtedness keeps them from expending money in clothes‡ and jewels. But generally their condition is far from wretched, and they are as apathetically contented as need be.

Mr. Imrie has given the result of his inquiry in the cases of 19 ryots, and has taken great trouble in the matter; but it seems of no use for me to tabulate these results, as the details of returns of income and expenditure are not reliable or are not clear.

Regarding the debts owed by these men the following particulars are of some value :—

A. owes Rs. 250 to a creditor, and pays interest at 24 per cent. The debt was contracted some 10 or 12 years ago on account of marriage expenses. It has varied in amount from Rs. 100 to 400.

B. borrowed Rs. 50, two years ago, to meet the expense of a marriage. He has since paid it off.

C. owes Rs. 100 or Rs. 125 bearing interest at 24 per cent. Last year the debt was only Rs. 75, and is due to a bad harvest.

D. some six or seven years ago borrowed Rs. 40 for marriage expenses. It has now reached Rs. 150, bearing interest at 24 per cent.

E. ows Rs. 100 to the lumbardars of his village; the cause of incurring the debt is unknown.

F. owes Rs. 200 on a very old account, increased by two marriages.

G., owing to marriage expenses, owes Rs. 100.

H. owes Rs. 40, borrowed for the purchase of bullocks.

J. owes Rs. 200 on an old account, which is being cleared off.

K. owes Rs. 12, borrowed on account of a bad harvest.

L., owing to two bad harvests, had to borrow Rs. 350.

One man is putting by his savings to provide for the marriage of his daughters.

One employs his savings by making petty loans. Others are increasing their live-stock.

Wasadeo Ballal Kher.

Wasadeo Ballal Kher takes the case of a man owning four plough bullocks, being a holder of land on privileged tenure and as tenant-at-will in equal quantities, having a wife and three children, besides two relations or dependents. He would farm about 15 acres. The two pairs of bullocks are worked alternately and grazed on or near the fields. For two months or more they are used in bringing fuel, timber, grass, and fencing materials from the jungles. They have to trample out the corn on the threshing floor. They rest about a month in the year. Besides grass, they have the chaff, about 100 seers of teora and about two rupees' worth of salt. They should last in vigour five years. A pair cost from 35 to 40 rupees. A well-to-do cultivator would have half a dozen cows, enough to give a new pair of bullocks every second year. They would pay for their keep without trenching on the produce of his fields. The typical cultivator employs hired labour only at harvest time, which is remunerated in kind. So many sheaves become the right of the labourer. These are threshed on the employer's threshing floor, and he is bound to see that each man gets not less grain than two seers of grain a day. If the weather be unsettled he may have to offer so much as four seers wage.

Mr. Wasadeo Bullal Kher gives the following out-turn factors, which are probably in most cases very far below the mark :—

Wheat	3½ fold.
Teora	4 fold.
Masur	
Batera	
Linseed	
Rice	
Cotton	
Gram	

Urad	10 fold.
Jowari	
Kodo	
Kutki	
Sama	

But on account of the husks of rice, kodo, kutki, and sama, one-half of this will represent the food return. Apparently he reckons the food out-turn of 15 acres at 24 khandis of 140 seers each. This again seems to me under-estimated. He raises his own tobacco, chillies, and vegetables, of which crops also he sells a part.

For his own consumption he gives over a portion of the oil seeds he raises to the oil-presser. If the Teli keeps the oil cake he charges only ¼ anna on each seer of oil. If the cultivator takes back the oil cake he charges ½ anna per seer.

The 24 khandis of grain are thus disposed of :—

	Khandis.
Seed	6
Kotwal, smith, carpenter, barber, washerman each 28 seers of grain	1
Food of seven persons at ½ seer a day	9
Total	16

To the 8 khandis surplus, at Rs. 5 a khandi =	Rs. 40
Add Rs. 5 for cotton sold, Rs. 5 for vegetables, &c.	„ 10
Total	50

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* I have frequently noticed the marked preponderance of the people from Saugor, Damoh, Jubbulpore, and Narsinghpur, passing through Bilaspur to or from a pilgrimage to Jaggernath at Pooree.

† Mixed crops on the same land.

‡ The people in Damoh, and probably in Saugor, are somewhat extravagant in the matter of dress. In Damoh it seems to be a proverb that the Lodhi, one of the most numerous castes, "will put on his back what ought to be put in his belly."

CHAP. I. QN. 9.

CENTRAL PROVINCES.

Mr. Nicholls.

EXPENDITURE.

	R.	a.	p.
Rent at Re. 1 an acre for occupancy tenure land, and 1¼ for other land - -	16	12	0
Cesses and Patwaris fees - - -	1	4	0
Gur - - - - - -	2	0	0
Salt - - - - - -	2	0	0
Spices, &c. - - - -	3	0	0
Clothing at Rs. 3 8 0 for each adult and Re. 1 each child - - - -	17	0	0
Total -	42	0	0

Leaving a balance of Rs. 8.

Now and then a pair of bullocks past their prime come to be sold.

It seems that Wasadeo Bullall Kher, like Mr. Imrie, regards the grain saved after all expenses of cultivation and harvesting have been deducted as income. The balance saved, if it is not devoted to the liquidation of debt, is turned into ornaments. The home consumption of grain is augmented by fruits, roots, and other minor forest produce, or raised in the "bári." "But the saving of cereals may be left out " of the account as a set-off against the additional ex- " penditure of occasional festivals and dinner parties " on a small scale." For meeting the costs of marriage ceremonies or the deficiencies of bad years, the ryot must trust to the more bountiful harvests of exceptional years. If he wishes to increase his scale of operations his first idea is to take more land under cultivation; secondly, to employ more labour; lastly, to raise some special crop, such as sugar-cane, which requires extra care besides the additional cost of irrigation.

BERAR.

BERAR.

Major Szczepanski.

When the American cotton failed, and the value of Berar cotton rose so wonderfully, a great change occurred in the status of the agriculturists. Much more money was expended on food, clothing, and other necessaries. Although the profit from cotton has very much decreased the expenditure has not decreased in the same proportion, and consequently many of these people are in debt. Those with any capital thrive well enough, but the others are entirely dependent on the saucars; and when this is once the case there is little chance of amassing capital. The produce of the land is made over to the saucar, who supports the ryots by advances at high rates of interest; and then it is very rare that they can extricate themselves. They know nothing of accounts, and are entirely at the mercy of the saucars. It is calculated that the saucars, what with high rates of interest and fraudulent accounts, double in two years the capital employed. There is no doubt that these men are necessary to the ryots, who, indeed, could not do without them; but the present indebted and helpless condition of the ryots will continue until they are protected by usury laws.

It is difficult to illustrate what has been recorded by examples, because the ryots keep no accounts of income and expenditure or of their dealings with the saucar, who, on his part, would not disclose the actual state of affairs. About one-half of the agriculturists are believed to be in debt.

Sri Krishna Narhar.

The population directly engaged in the cultivation of the land is composed of Kunbi, Máli, Bári, Rajputs, and Mussulmans, &c. The Kunbi exceeds in number the rest by many times.

Ryotwari system prevails in Berar as in the Madras and Bombay Presidencies; the agriculturist, therefore, possesses only right of occupancy, which, however, is declared to be a transferable and heritable property, and the occupant is not deprived of it so long as he continues to pay the assessment due upon his land, the extent of possession of which varies in quantity in each case. The land is seldom or never set apart for grass, and is invariably brought under tillage. He supports his live stock with the stocks of joari and husks of grain, as well as upon grass of fields set apart for free pasturage, that of unarable land sold by public auction, and that of the forests to which they are exported during the season they are not required for field work.

Besides his engagement as tenant directly with Government he often enters into contract as a sub-tenant with those Government tenants, such as Brahmins, Rajputs, Marwadas, and well-to-do Kunbis, who have land in their names, but who are not immediately its cultivators. The consideration for such land is of two kinds; either payment in money, which exceeds by many times the Government demand, or equal distribution of produce between himself and the Government tenant, who pays the land revenue, or, under the terms of the contract, burdens the sub-tenant with it. An example of the one may be found in Chandrabhan of Mouza Gowlkhera in the Ellichpur taluka, in the statement alluded to. The 36 acres of land against his name have been obtained by him for Rs. 215, the ordinary land revenue of which does not exceed Rs. 40. The other mode of consideration is called the batai system, which in many respects resembles the metayer system in Europe. The high prices of grain since the visitation of the Madras and Bombay Presidencies by famine, and that of cotton since the failure of the American crops, raised the value of the land, which before these events had no price, for it was frequently resigned by the cultivator, and a number of fields in each village remained uncultivated. Never since the first deficiency of cotton in America has the price of that article in this part of India been what it was before, viz., Rs. 8 per bale. It has been so high as Rs. 125, and not lower than Rs. 20. The demand for the land has increased to such an extent that every waste field has been taken up. Part of the large block considered as unarable by the Survey Department has also been cultivated, and, if Government had permitted, the land set aside for free pasturage would have been taken up.

The family of the agriculturist is commonly undivided, and consists of his parents, brothers, his and their wives and children, &c. The members are never a burden to him, and contribute by their labour to the cost of their maintenance; they work in their own fields, and for hire in the fields of others. Females who do not appear in public, and who are unfit for work in the field from old age, &c. gin, or spin cotton at home.

Notwithstanding his indolence and want of exertion, as I shall show hereafter, the agriculturist, by the fertility of the soil, is able to raise sufficient amount of food-grain and other produce, as detailed separately in each case in the statement, on an average in a year for his family consumption, and to buy with a part of it things which his land does not produce, and which are necessary. What has been shown in the statement is not the only kinds of produce the cultivator raises: hemp, safflower, oil-seeds of different varieties and grain are also produced. The amount of revenue he pays varies with the quantity and quality of the land.

The expenses he incurs in hired labour are somewhat more than what it would be had he been industrious. He has very little active spirit in him, and

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BERAR.

Sri Krishn Narhar.

he is more inclined to rest in comfort than to work. He would never set out to work in the field before 11 a.m., and the members of his family and the labourers follow his example. They reach the field a little before mid-day, and leave it so early as to be able to return to their homes before dusk; the time therefore of the labour is limited with reference to the distance of the field from the village. Though the work is done for half a day, the whole day's wages are claimed and paid. The argument is that this is the custom in Berar.

If the agriculturist, after the example of his brother in Khandesh, would attend the field with the members of his family in proper time, a great reduction would be effected in the amount of expenses. He has become so indolent, specially since the lucky days of cotton, that he often employs a labourer in his stead and stays himself at home an unproductive consumer.

The expenses in hired labour shown in the statement are only those which he incurs in the shape of money; those he incurs in kind cannot be shown, for he takes into account the balance of the produce which he carries home after paying off the labourers, the village servants, the smith, and the carpenter, &c., who render him service during the year without charging for it or a portion of it, and which only has been entered in the statement.

The labourer employed annually is both directly about the things produced and in operation preparatory to their production. The natural advantage, the peculiarly good quality of the land here does not require the same preparatory operations every year. The ploughing, which is the most expensive of all the processes, is necessary only once in 12 or, in some instances, in 20 years. Harrowing is all that is essential annually to smooth the land. The agriculturist is not always in the position of carrying on this easy operation with his own establishment, and often has recourse to hired labour. In many villages the practice of remunerating labour with labour is obtained, and he works in the field of him who has worked in his field. Four men and three pairs of bullocks are requisite for a plough here, unlike the custom in Berar, Balaghat, Buldana, and Basim, where one man drives three pairs of bullocks.

Bullocks here are trained both for cart and plough, and are more governable, consequent on the nose-string, than the bullocks in Balaghat, where they are only trained for the plough and are free from the nose-string.

The agriculturist's annual expenses in purchases of necessaries which he cannot produce on his land, though moderate, are greater than those of his brother in Khandesh. His ordinary food is simple: joár bread, tur, múng, urad, or masur dall, and a vegetable are all that he receives daily for his dinner. His breakfast is bread, which he eats with onion, garlic, salt, chilly, oil, or chatni. His food differs on holidays, on which occasions he eats wheat bread, tur, dall, ghee, sugar, and vegetable, &c.

His dress is respectable: turban, dhoti or wearing cloth, angocha or body cloth, angarkha or coat, and shoes, are his necessary apparel. Angarkha, however, is worn on holidays, or on occasions of appearing in society, in court, &c. Berar is much improved in point of dress as compared with Khandesh, Poona, Sholapur, and Pandharpur, &c., where the set of dress of an agriculturist consists of a "lungoti" and a blanket; the former is not even known here to the boys or the lowest Hindu—the Dhed.

He bathes every day, and is superstitious. He does not drink, though drinking does not excommunicate him from caste or society, and eats flesh on certain occasions, which are not more than two or three in the year. He is fond of tobacco, which he masticates with betel, and carries about him a bag divided into several portions, each of which contains different stuff of which the betel is composed.

Physically he is neither so strong nor so tall as his brother in Khandesh. He is of middle stature, brown complexion, dull and slow in his work, and appears in consequence of his peculiarity of dress more like a mahajan than a cultivator. One who has visited Berar for the first time from Khandesh, would take him for the one, rather than for the other.

The kind of house he lives in has mud walls covered with grass, called chupper, or a flat roof, called dhaba. It is limited in space, and is seldom divided into one or two rooms. It is kept clean, and has always one or two out-houses used as cattle sheds. The arrangement within is not at all such as would please a visitor. One would see nothing but litter of clothes and utensils,&c., about the whole space.

He possesses the quantity of cattle or other live stock according as the village he lives in has or has not the advantages of the hills upon which the grass and the fuel grow. He whose village is at the foot of the ghaut generally possesses a larger number of them than he who lives at a distance. When he has no field work and his pressed for money, he employs himself in bringing in fuel upon his cart for sale, and during the non-working season keeps his cattle upon the hills, where grass is in abundance and accessible at a nominal price. He also carries the produce of his land, and that of others, for hire on his cart to the nearest market. He is very fond of going in a cart even if the village he has to visit is close.

Buffaloes and cows, whose number increases annually, yield their owner milk. The females are expert in the management of the dairy, and amply supply the nearest weekly bazaar with butter.

The other property the agriculturist possesses consists of carts, gold and silver ornaments. The cart is neither well fitted for conveying people nor property. Its construction is singularly of the worst kind. The wheels are low and have narrow tires. The people have begun to distinguish the difference between Berar and Khandesh carts, which are better constructed and better suited for both the purposes, and are importing them into Berar.

Gold ornaments are composed of nose-ring and ear-rings for females, finger-rings and ear-ring for males. Silver ornaments consist of necklace, bracelets, armlets, and ankle rings for the females, and a bangle and waist-band for the males.

The agriculturist's stock of grain is generally sufficiently large to subsist him and his family until he reaps his harvest. This stock is not, however, in every instance the result of saving, but of withholding repayment of a part of his debts.

The instances of accumulation of surplus income or of lending money are very few. The agriculturist spends on marriage and other ceremonies not only the surplus income, but all that he could obtain on credit. On ceremonies preliminary to the marriage he spends much more now than what he used to some years ago for the marriage itself.

His debts vary according to his circumstances, which are too many to be enumerated: his large family, the natural reverses, deaths, marriages, &c. They are, however, not often beyond his means of liquidation if the creditor has patience and allows him time to do so by instalments.

The debts are commonly due to his improvidence, and the unfair dealing with him of his creditor. The unfavourable circumstances in America and the crisis in India which raised the prices of the produce of the land, improved his condition, but not his intelligence and foresight. With improved condition, he coveted the comfort and luxury of the higher classes of the people whose manners and customs he imitated during marriages, and in place of ten spent a hundred. Being unaccustomed to purchase articles of luxury, the dealers in them took advantage of his ignorance and sold them to him for prices twice or three times the amount of their value. He acquired an emulative spirit, anh desired to gain superiority over others in the matter of expenditure in marriages. He thus exhausted all his resources, and became a dependent upon the money-lender who became his capitalist, without whose assistance he could do nothing.

AP. I. QN. 9.

BERAR.

ri Krishna Narhar.

The wholesale cultivation of the land and the high prices of the produce raised the prices of labour, and the demand for money the rate of interest, and, what amounts to cheating, introduced a practice of paying less consideration than that stated in the bond. For every hundred in the bond the consideration has been Rs. 82 or 85, or less. The circumstances in America have changed and the price of cotton is reduced, but the ostentatious habit of the cultivator and the usurious practice of the money-lender remained unchanged, and are still continued. The pressing need which obliged the agriculturist to give his passive acquiescence to the usury practised upon him encouraged the money-lender to advance a step further. He untimely demands liquidation of his debts, and compels the debtor to sell to him the produce of his land before it is raised at a low rate, to be delivered at the harvest; and if he fails to fulfil the contract debits him with the prices at the rates, which are always high, prevalent in the market. He then receives a bond for the whole amount, or the debtor's acknowledgment of the accounts in his books, by causing him to affix a stamp thereto, and thus secures his interest against the contention of the debtor.

The combination of all these facts, which have been originated by the improvidence of the agriculturist, does not place it in his power to escape from the money-lender's grasp at his will, if he once falls into it. The result of this is that the original cultivator of the soil is day by day losing his hold, and his place is being taken up by the Marwadi and the other classes of money-lenders. Government, being alive to the interest of the agriculturist, has withdrawn the power from the civil court of sanctioning the sale of the land in execution of decrees, and has divided it between itself and the Commissioner, according as the property is ancestral or self-acquired respectively, and I often see that the sanction for sale has been refused by these authorities; but this measure has not proved a success, for by private arrangement the land is being transferred from the owner to the money-lender.

I believe 75 per cent. of the agriculturists of this district to be in debt, and that their average indebtedness is four times the average of their yearly income.

Mr. W. B. Jones.

EXTRACT from the REVENUE REPORT for 1877–78.

Economic position of the Agricultural Classes, and transfers of Agricultural Holdings.

The first subject of this chapter is one regarding which there is happily at present but little necessity to say much. The Berar cultivator is probably as well-to-do as any man of his class in this part of India, and, thanks to our almost perfect system of tenure and settlement, does not appear to go down in the world as cultivation advances and the value of land increases, as all but the privileged members of his class are apt to do where the malguzári system prevails.

The Deputy Commissioner, Bassim, remarks that the extent of land available to cultivators enables them at present to set even saucars at defiance; for if pressed too much, they can move off to other villages and saucars; but he apprehends that, as cultivation increases, the cultivator will be more and more at the mercy of the banker. There is no doubt something in what Captain Bullock states; but, as far as I am aware, there is no proof that what he apprehends is actually happening. I have never heard that the cultivators of Akola, where cultivation has almost reached its utmost limit, are worse off than men of this class elsewhere; and statement L. certainly lends no countenance to Captain Bullock's theory. The figures for Akola are somewhat large; but the district and the number of occupied fields and the value of land are high also.

It is, in fact, one of the distinguishing merits of the Bombay system of land tenure and settlement that under it the cultivator is far less *ad scriptus glebæ* than he is under the malguzari system.

When circumstances turn him out of one village, the world is all before him where to choose, and he has not to make terms with any proprietary body, or conciliate any powerful landowner. The State offers him land in all its districts; and there can be no doubt that the facilities which a Berar cultivator has for transferring himself where he pleases is an important element in his prosperity, and a great economical advantage besides.

Comparing Berar with the Nagpur province, I have remarked that pátels here are much less frequently the village bankers than malguzárs are there. The fact, if true, has its unfavourable as well as its favourable aspects; but it is no doubt the result of the difference in the system of tenure in the two Provinces. The pátel here is less impelled towards banking than the malguzár there, because his office is not permanent in his own family, and he cannot aid his banking operations by the despotic power which a malguzár wields over his tenants. It has also to be admitted that the patel is a less wealthy person than the malguzár, and is therefore less able to lend.

It has already been stated in Chapter I. of this report that the fine cotton crop, and generally fair joár crop, of the present year, have, combined with high prices, brought a great deal of money into the Province and assisted (as is believed) in reducing agricultural indebtedness. The statement now submitted confirms this favourable view. Considering the number of decrees constantly being given and now in force, the number of cases in which the sale of land is applied for is surprisingly few, and the number in which it was actually sold perfectly insignificant.

I have even come to doubt whether the restrictions which we place on the sale of land are beneficial. When in the Central Provinces I advocated such restrictions, and were I there now should do so again. But in Berar I find all the arguments which I have been in the habit of urging in the Central Provinces in favour of restriction cut from under my feet. There is no political danger here in unrestricted sale, and much economic advantage. A malguzar in the Central Provinces who has lost his village is ruined, but the Berar cultivator who loses his field can start again in another as soon as he pleases. A discretionary power which, like that in question, does not (at least such is my experience) admit of being exercised on well-known and recognised principles, is by that very fact condemned. If the refusal to sell were of much use to the judgment debtor there would be some excuse for refusing, but we know that even this justification is wanting and that the judgment creditor can, notwithstanding refusal, make the field quite valueless to the judgment debtor. My view, then, is that, while the uncertainty which the discretionary power produces tends to diminish the credit of every kunbí in Berar, and is therefore a grave economic evil, the cases in which the power can be exercised with fairness are very few, and those in which it can be exercised with any advantage to the judgment debtor still fewer; and that its exercise should now be limited to a few clearly-defined and selected cases. The matter would, of course, need to be thoroughly discussed; but some Deputy Commissioners I know think as I do. The principle I now go on is to sanction every application that comes before me, unless there are clear reasons for refusing to sanction.

The prices realised at sales by decree of court were, considering that in numerous cases there were liens on the land, quite as good as I should have expected. The smallness of the prices realised in sales for arrears of revenue has been already explained.

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Mr. Bahman Jamasji.

If the Berar agriculturist's condition was to be inferred from the income he ostensibly derives in comparison with the outlay he is apparently put to, the conclusion would be that he was literally rolling in accumulated wealth hoarded with the most miserly intent, for his person and belongings, his habitation and his wants to superficial view betoken most miserably limited expenditure. But if inquiry were directed beyond the domestic thresholds of these people, it would soon be discovered that very far from effecting hidden hoards of gain they really live in the most precarious manner, that their income in most cases meets, and barely meets, their necessities, and while of them a favoured few may have enough and to spare, their number is more than counterbalanced by those who really have not a sufficiency to meet their most ordinary wants, and whose state is practically an endless bondage of indebtedness.

Before proceeding further, a point of obvious inquiry merits notice. It has to be admitted that, judged by the difference of prices, the income of the Berar agriculturist should have immensely increased over what it was 20 years ago. That he has not undergone a corresponding improvement in his condition is a fact sufficiently apparent to need explanation, and this explanation is contained in the following causes :—

(1.) Although the rates at which field produce is marketably disposable are now more favourable in the ratio of 1 to 5 than they were 20 years back, the producing capacity of land in Berar has been diminished in an almost equal proportion. The rapid succession on which crop succeeds crop in the present day was not known in the bygone period in reference, and field land has therefore undergone an exhaustion of its fertile elements which the cultivator, in his constant need of means and his consequent avarice, has not been enabled to supply by the agricultural expedients which would have been possible of application were the soil given a period of rest and recuperation. Such periods of rest were of frequent intervals when the land was not surveyed nor measured, and portions of it set apart to cultivators, who used to take for their use as much land as they pleased for a nominal rent, thus enabling themselves to allow rest alternately to portions of the land; whereas now it is different; all land has been surveyed, measured, and duly apportioned between cultivators, who cannot now take an inch more than is allotted to them, and try to realize out of it as much crop as they can to defray Government demand, as also to satisfy their avarice, which has considerably increased on account of high prices.

(2.) The cultivator is now put to expenses which in former times he did not know. His pecuniary wants are so pressing that often the whole produce of a crop is disposed of by him without provision being made from it for his own subsistence, and very often without his even reserving from it a sufficiency of seed grain for future sowing. He now pays more for his cattle than he did of yore, and he can no longer fell a tree from any place he likes to provide him with a shaft for his plough, or a yoke for his oxen, He has now practically to expend coin where before he needed only to labour, and the grass with which he annually thatches his hut has now to be bought, and not merely cut and carried as it used to be.

(3.) The manure the cultivator now uses has to be paid for by him both practically and dearly. The days when large areas of waste lands adjoined villages in Berar and afforded free and abundant pasture to village cattle have now departed, and in the present time the cultivator has to either pay the possessors of pasture lands for the privilege of grazing his cattle on them or to set apart a portion of his own land for the purpose—an alternative which represents loss on his part to the extent of the value of the crops that might have been raised on such land and the amount of revenue that has to be paid for it all the same. Thus the difficulties attending the keeping and rearing of large herds of cattle by the Berar agriculturist have increased so as to limit the number of head he now possesses to the actual requirements of tillage, and in this way the supply of the only description of manure used in Berar has been, in the cases of the mass of cultivators, so reduced as to be altogether insufficient to meet the demands of the soil for nourishment.

The above are material causes which have tended to impoverish the Berar cultivator by reducing his income. There are, besides, other causes of habit and condition which co-operate with these in keeping him in a state, as regards worldly means, not much, if at all, in advance of the original condition of not only himself but his forefathers. In a ready market for his produce he has acquired facilities for coming by ready money at frequent intervals, the possession of which has tempted him towards luxuries and extravagances which his fathers never dreamed of. The increase of trade and commercial prosperity has brought the agriculturist in contact with people whose ways in some respects he has been apt to imitate at the expense of his purse. He has acquired habits of laziness and indolence which keep him at home in a Bombay or Manchester "dhoty," when his father would have been out in his fields tending his crops, scantily clad, but with this further difference that while the father's *jarness* were well filled the son's are empty, and that while the father never owed man a pie the son has made frequent acquaintance of local law courts and law agents in the capacity of both plaintiff and defendant. These are broad assertions, but the following details of facts present to both the recollection and the experience of Berar officers will amply substantiate them.

As regards the unwillingness of the cultivator of the present day to personal labour, a modified exception may be made in the case of *malis*, *baris*, and *pajnis*; the rest of the different agricultural classes consider it derogatory to work with their hands, and employ labour instead until reduced to the very last stage of indigence and want. This disinclination is participated in by the entire household, and where mothers worked, and worked hard, weeding and gathering crops, their daughters employ themselves simply in the performance of domestic duties.

The extravagance of the Berar agriculturist is to be seen in his superfluous belongings. A cultivator of these times is seldom without his special *sowari* cart, his pony, and his buffalo; these are pure luxuries, perfectly dispensable; they do not contribute towards any agricultural ends, and they represent sources of primary outlay and continuous expense; but the penalties of debt and impoverishment will not induce their possessors to forego them. The convenience they afford him is small, but the conceit they enable him to indulge in is a great object, which to his mind and limited vision quite justifies equivalent sacrifices on his part. Extravagance, misplaced as it is in a class of persons whose frugality is generally above that of any other class, simply because it is an absolute necessity to comfortable rural existence, is an evil much aggravated in the instance of the Berar cultivator by the most downright improvidence. In every caste ceremony he recklessly undertakes the most ruinous expenses, not always indispensably necessary, and as regards the ceremony of marriage, he is here to be seen in his most spendthrift mood. Guests are invited from some times a hundred miles away. They come down in cartloads; their journeying expenses are all paid, and for days together they and their cattle are fed and treated after the most lavish fashion. Institutions as "*nautch*" girls are an indispensable adjunct, not because the extravagance can be indulged in by reason of ample means, but because it must be committed for appearance sake. In the neighbouring Presidency of Bombay a marked contrast might be found in the manner in which the agricultural communities conduct and manage their marriages. There also is a tendency to considerable extravagance, but it is well tinctured with providence and forethought in this much, that when in the Satara, Nuggur, or Poona districts a cultivator gives or receives in

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marriage one half of his ceremonial expenses takes the form of presents of jewels—the most favourite Indian method of saving money. The all-absorbing feeling in Berar is to present an affluent outward appearance, which if not possible from means at hand must be effected by indebtedness. Superfluous caste ceremonies not known elsewhere have grown and do now flourish amongst the population of Berar, and these are instituted on the smallest pretexts; thus, the arrival at maturity of a girl entails rejoicings and feastings akin almost to the ceremony of marriage.

The tenacity with which the Beraree will prosecute a grudge against his neighbour, or press a claim for anything he considers obtainable, is another prolific cause of his being usually the possessor of very limited means. These disputes are generally confined to *mirasdars* and *watandars* of land whose class is very extensive, and who are principally fond of, first their land, and, secondly, their "*watan.*" Fortunes are squandered, and want absolutely invited to overthrow a rival, to substantiate a claim, or to revenge a wrong. The Beraree, while he never forgets or forgives, will hope, and hoping, expect the most impossible things. He will use the means he may have as instruments of attainment, retaliation, or revenge without the smallest regard of his present state or his future prospects. Instances like the following are of frequent occurrence. Two brothers will conceive a claim to a certain acre of what they consider ancestral land. They have both of them much other land, but an especial fancy for this acre takes hold of them, a claim and counter-claim is generated. Proceedings are launched with the declaration on the part of each individual that he will press for possession even to Her Majesty's Privy Council, in village parlance "*Nandanlugoo,*" and each will reduce himself from comparative affluence to absolute beggary in the contention for the possession of this coveted and charmed, albeit miserable acre of land. Similarly, the origin of a grudge or dispute is often most trivial and contemptible; for instance, in Berar there exists a practice during weddings of presenting as a mark of especial consideration a "*Beeda*" (a couple of "*pan*" leaves rolled together with a few pieces of nut, &c.,) to the head man of the village, and of marking him on the forehead with a "*Tilluck*" generally a dot of turmeric. Two brothers will enter into competition for this very empty distinction, and will squander their all in contending their rival claims to it. It would be, perhaps, interesting and instructive here to proceed to details, and to give an instance exemplifying the manner in which the ordinary agriculturist impoverishes himself to a greater degree in his pursuit of an indefeasible end. Having generated in his mind a claim or a process of retaliation or any other cause, he thus furnishes himself with means for carrying it to fancied accomplishment. He happens to have land paying a revenue of Rs. 102–9–0 to Government, and requires immediately, in March 1853, a sum of Rs. 100. He has recourse in this situation to a "*sowkar*" from whom he receives Rs. 95. In return for this he executes a bond for Rs. 50, payable on the reaping of next "*kharif*" harvest, *i. e.*, November of the same year, with interest at 2 per cent. per mensem, conditioning in default to pay an excess rate of interest to be calculated at Rs. 3–2–0 per cent. per mensem. For the moiety of Rs. 50 he enters into legal arrangement to deliver by February of 1854 five maunds of wheat and a kandy of gram, and in further default to deliver the same quantity, with 50 per cent. added, or the value of the whole at bazaar rates at some other date. Now, reading between the above lines it will be evident to anyone acquainted with normal agricultural conditions that as the "*kharif*" crop is never stored before the end of December, and the "*rabi*" before the end of February or the early part of March, that the contracting parties in the above transaction have agreed to, and accepted, conditions simply impossible of fulfilment, actuated to do so on the one side, the creditor, by prospective quadrupled returns, and on the other, debtor, by fancied or real want. On the date of the first payment becoming due, the sowkar demands liquidation; the borrower has not the money to meet the demand, nor has he any produce equivalent in value to its extent; he therefore temporizes, and ultimately replaces the original bond of Rs. 50 with another of Rs. 65, in which he conditions to deliver in the month of *Magh, i.e.*, February, two kandies of cotton at Rs. 32–8 each, albeit the selling rate of cotton at the time of effecting this agreement is Rs. 40 per kandy. It is further stipulated and agreed to, that in the event of failure to transfer the two kandies of cotton above-mentioned, payment shall be made in coin calculated at the selling rate of the staple at the time of failure. Now the total receipts of the borrower in the form of *kharif* field produce, from the harvesting of which he has to meet the obligations above incurred, is two kandies of cotton and six kandies of jowari. The two kandies of cotton he sells forthwith at 35 Rs. each, to be enabled to meet the Government revenue, the first instalment of which (Rs. 51–4–6) just then becomes due. The unexpended balance of Rs. 19 he retains for his household expenses. As regards the jowari two kandies are stored for seed, and for grain payments for field labour, the remaining four kandies being reserved for household consumption. Now the Rs. 65 bond falls due, the borrower has no cotton to deliver as agreed; the sowkar is importunate, the borrower cannot meet his wishes, and begs to be allowed to fall back on the alternative already provided for in the bond, and by virtue of which he acknowledges himself to be under a liability of Rs. 100 for two bojas of cotton. It should be remembered here that the selling rate of a boja at this time is only Rs. 45. The second agreement about the delivering of the *rabi* crop is now due; but the crop is not ready, and the borrower is compelled to adopt the alternative in this last agreement also, and to meet the "*dedhi,*" *i.e.*, 50 per cent. added, agrees to deliver 11¼ maunds of wheat and 2¼ kandies of gram by end of March. In this month he harvests his "rabi" crop, which yields a kandy of wheat, 17 maunds of gram, and 3 maunds of "til." This he disposes of as follows:—

Of the wheat 12 maunds are kept for household consumption, the remaining 8 maunds being sold for Rs. 40. The *til* is sold for Rs. 12, and this just pays the balance of the Government revenue for the year, *viz.*, Rs. 51–4–6. The 17 maunds of gram the borrower offers to the sowkar who refuses to take it, as it is not the full quantity agreed, *i.e.*, 2¼ kandies. To please the sowkar the borrower again accepts a liability of Rs. 300, made up of Rs. 225, for 2¼ kandies of gram, and Rs. 75 for wheat, and in immediate liquidation pays Rs. 85, received by selling the gram refused by the sowkar, and executes a bond for the balance of Rs. 215. Reviewing the transaction above detailed, it is evident that, for a principal of Rs. 95 actually borrowed, the borrower has, in such a circuitous and mysterious manner, been compelled to pay Rs. 430, of which Rs. 85 are to his credit, the net liability thus amounting to Rs. 345. The transaction is thus continued from year to year, and the poor *kunbi* sold to the sowkar outright. The instance above quoted is between a common *kunbi* and a respectable Marwari. But if I were to point out cases of other money lenders, such as Marwaris, Rajputs, and others dealing with the *kunbi* in every village, it will be seen that instead of Rs. 430 in the instance quoted there would be Rs. 615, and a case recently came before me in which a sum of Rs. 150 only was borrowed, and though the defendant paid this Rs. 150 and more there was a balance of Rs. 160 for which suits were brought. Many such cases occur before me. I would mention here a celebrated money-lender of Nagpur, who goes by the name of "Bootwala." This sowkar pays only Rs. 67–8–0 for a Rs. 100 bond, which accounts for the sum as follows:—

Rs. 80 principal, with Rs. 25 added to it as "*sawai*" (*i.e.*, Rs. 25 per cent.) payable by Rs. 4 a month, first instalment as also other charges on account of god Balaji and discount, aggregating in all to

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Rs. 32–8–0. In about two years a sum of Rs. 126 is made of the Rs. 67–8–0 originally lent. And when the original debtor, as above, dies, the *sowkar* knows full well that the deceased's liability extends to his assets only, under Act XXVII. of 1867, and that by a suit his interests will be damaged, so he avoids a court, and prevailing upon the four sons and the widow of the deceased by promises, brings them into his clutches by inducing them to execute a fresh bond in their names for the balance due by the deceased. To effect his purpose he lends them a small sum, such as Rs. 5 or Rs. 25, thus showing them that he is very lenient, giving also a further remission of about Rs. 50 from the said balance. He thus leads the sons and the widow to think that he, the *sowkar*, is very kind, and that they should not play tricks with him. In this way the sons and the widow saddle themselves with the deceased's liability. The *sowkar* again commences robbing these wretches as he robbed the deceased, being, in the renewal of the debt, much better off, inasmuch as he has now a hold upon five persons instead of one (the deceased debtor). This transaction expands as each of these sons get sons and deaths occur. But the *sowkar* was able to do as above, on account of the ignorance of the heirs; but when these happen to be clever they drive the *sowkar* to a court, who, having in his possession a legally executed document, obtains a decree against the deceased's estate (now it is to be seen how this clever heir runs to the *sowkar's* house). In executing this decree (which, suppose is for 1,000 Rs.) two fields belonging to the deceased and worth about Rs. 200 are attached. (It is well known that a Beraree will not see his ancestral lands taken away by others at any cost, for a piece of land valued at Rs. 10 he would spend Rs. 500). After attachment the heir is compelled to go to his *sowkar*, and he goes and executes a bond for his father's debts with whatever interest the *sowkar* was obliged to let off in the suit, aggregating in all to Rs. 1,250, mortgaging at the same time the fields under attachment. But that ignorant man does not see that the Rs. 200 worth of fields will go away in a few days without reducing a pie in the Rs. 1,250. The poor man is thus deceived, and the *sowkar* not only keeps up his debtors either way, namely, avoiding a court, and going to it, but increases their number. I have found by my experience that a third of the cultivators of Berar is in debt in the above manner. I have come to this conclusion by the information I got, and inquiries I made from the tahsildars, and the conversation I had with the cultivators themselves.

BOMBAY.

BOMBAY.

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An inquiry into the economic condition of the ryot embraces considerations of the character of the country in respect of its fertility, of its climate, the state of agriculture, the social condition of the people, and their habits and customs. Of these, fertility and climate are elements most variable and uncertain in their nature, being affected by uncontrollable and eccentric influences. Nor are the other considerations less complicated and indefinite in their character. The task proposed, therefore, is somewhat difficult, and the success of the inquiry will depend in a great measure on the quantity and quality of the information available.

It would perhaps facilitate the inquiry if we consider separately, firstly, the ryot's income, and, secondly, his expenses.

It is very difficult to form an exact conception of the ryot's income and resources. If asked, he estimates the value of the grain produced on his land, and of the sugarcane and other garden products if his land admits of such cultivation, and says that is all the income he enjoys. But this does not represent his total receipts; it only forms the most important item of his income. He has other sources of gain, direct and indirect, which materially assist him in the maintenance of his family and his establishment. His land, even when he has no special grass lands, produces grass, by which he is enabled to maintain his cattle. He is even sometimes able to sell grass and thus add to his resources. He produces cucumbers and other vegetables on his ordinary fields, which his wife sells in a neighbouring market. His cattle give him milk, manure, and fuel in the shape of cowdung cakes, and his butter and ghee fetch a good price in the neighbouring town. He is often able to sell young bullocks and buffaloes with great advantage to himself. The karbee (straw) forms a very lucrative source of his income. He is seldom required to employ hired labour, unless he happens to have a very large holding, his wife and children assisting him in the labours of the field. He assists his neighbours, and they are willing to assist him in return. His children look after the cattle, and his women do sundry works, the value of which it is difficult to estimate accurately. When disengaged from his farm, he occasionally employs himself as a cartman or as a labourer, and thus adds to his income. In cotton districts his women are employed in the work of picking cotton, for which they are paid in kind, in proportion to the quantity of work done. They spin the cotton thus obtained and sell the yarn, the amount realised being expected to provide the family with ordinary clothing.

It will thus be seen that the sources of the ryot's income, though apparently insignificant when separately considered, are so many, that in the aggregate they enable him to realise a sufficient amount for his maintenance. In the statements received, the ryots' incomes are represented to be rather low, and one may at first sight wonder how he is able to maintain his family within an income so narrowly circumscribed. But when the sundry sources of income enumerated above are taken into account, the mystery becomes perfectly explicable.

But it would be unfair if we omit to take an equally comprehensive view of the ryot's expenses. As a general rule he is never required to spend any cash in the purchase of grain for food. In nine cases out of ten he is able to sell his grain products after satisfying the wants of his family. He likewise never buys grass or fuel, but he has to pay for oil and condiments, as also for tobacco for himself and bangles for his wife. His payments are made partly in cash and partly in kind. In almost all the purchases made by his wife the latter mode of payment is resorted to. But it requires to be noticed here that in making payments in grain he is always a loser, though he is never conscious of it. In his eyes grain has comparatively little value, for it is produced in his fields, and half and quarter of a seer of it is nothing to him. The shopkeepers, however, are not so simple and generous, and they always manage to take from his ignorant wife more grain than the value of the goods or other articles which they exchange with her.

His expenses in clothing are regulated by his circumstances. But as a rule his dress is very simple, consisting of a little piece of cloth to hide nakedness, a small turban or rumal as a covering for the head, and a kamblee or a scarf hanging upon his shoulders. Cultivators very seldom use coats or jackets. Their women have each one or two sarees and cholees (bodices), made of very coarse fabric. Their infants are given jackets, but as they grow up and play about in the street, they are generally seen without any clothing on. As he is required to spend cash in procuring his clothing, he generally keeps himself very poorly clothed. His clothing consequently is by no means an index of the quality of the food he uses; for he even uses milk and other simple luxuries at his meals sometimes, though he may be very wretchedly dressed. When he is in pretty easy circumstances, he

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tries to provide his wife with a holiday dress, which lasts her for about 10 years.

On the occasion of festivals and fairs he uses better food, and spends some cash in buying sweetmeats and toys for his children, when his circumstances permit him to do so. Marriage is perhaps the most costly event in a native family. Even the poorest ryot is required to spend Rs. 25 or 20 at least. The birth of a child also puts him to some expense. Occasionally he has to incur expenses for funeral ceremonies, which vary from Rs. 3 to Rs. 10.

His expenses in agriculture form a very important item also. He has to purchase manure for his fields, and occasionally has to pay for cattle for agricultural purposes. He seldom thinks of constructing a new well as long as he is in straitened circumstances, but if his well requires repairs he cannot neglect them, however poor he may be. He has occasionally to buy a mota or a leather bucket to work his well, and a cart to fetch his manure.

The implements of husbandry have to be oftentimes repaired. It appears from a comparison of the statement appended that a ryot's expenses on agriculture are, roughly speaking, equal to about one-tenth of his land produce.

The above estimate does not include the land assessment and local cess. These latter are equal to about one-eighth of his land produce.

In speaking of a ryot's expenses, it deserves to be mentioned that he is generally hard up for cash, and therefore minimises his expenses where ready payment in cash is necessary. In spending his grain, vegetable, grass, karbee, and other things produced on his lands, he is generally lavish.

When a cultivator is able to save, he lays out his savings in buying bullocks, in providing himself and his family with better clothing, in making small improvements in his dwelling, in drink, in providing ornaments for his wife, in buying a cart, and in constructing a well. His expenses on marriages, births, clothing, &c. keep pace with his prosperity. He often likes to extend his support to his poorer relatives, and to enjoy the luxury of a tat or a conveyance.

Under ordinary circumstances, the ryot is generally able to manage his expenses within his income. But he is somewhat improvident and saves little, though he is often in a condition to do so. When he is required to undertake any extraordinary expenses, such as those for buying cattle suddenly lost, or purchasing a cart, repairing or constructing a well, his savings seldom come up to his requirements. He has then recourse to the village saucar, and this introduces a new element into his affairs. The ryot is simple, ignorant, and improvident; the saucar is clever and calculating, sometimes flattering and sometimes overbearing. In the long run, therefore, the cleverness of the one generally gets the better of the simplicity and ignorance of the other. In plain words, the cultivator is seldom able to get out of the clutches of the village saucar.

We have said above that extraordinary expenses compel the cultivator to go to the house of the village saucar, and as such occasions arise in the lifetime of every cultivator, a large proportion of the cultivating classes is to be found in a state of indebtedness. It appears that about 75 per cent. are in debt, 50 out of them being hopelessly involved, and the debts of the remaining 25 being so moderate as to enable them to retain credit.* The indebtedness of the ryot is readily but vaguely ascribed to heavy assessments demanded by Government, but it would not be too much to state that the ignorance, simplicity, and improvidence of the ryot, and the saucar's high usury, have much to do with it. In many villages it appears that the amount paid by the ryots as interest to the saucars for sums advanced by them is equal to the whole amount of the land revenue recovered by the State. It even exceeds in certain cases. The rates of assessment as a general rule are fair, with a few exceptions, perhaps, that may be found in some talukas in which revised rates have been introduced. It is probably in the manner of recovering the land revenue that severity is sometimes perceptible. Extraordinary misfortunes often befall individual cultivators, such as destruction of the crop by fire, inundation, mildew, &c.; but practically relaxation is sparingly shown in recovering the assessments, because in good seasons higher rates are not demanded, while inamdars and native darbars show some indulgence under such circumstances. They perceive the ryot's helplessness, and show him a degree of leniency which his condition deserves. The arrears are, however, afterwards recovered when the ryot gets a better crop, and he does not grudge to pay it. But when he is straitened in his means, he finds it a hardship to have to satisfy demands if they are rigorously enforced. He is then compelled to call in the aid of the village saucar, which places him entirely under his power. It is thus to the rigour used by the officials in recovering assessments, and not, as is vaguely supposed, to the rates of assessment levied, that the ryot's indebtedness is to be partially and indirectly ascribed.

There is another reason why the present system of assessment is sometimes found fault with by the ryot. Under the native régime the cess was calculated on lands which were actually under cultivation, the fallow and grass lands being generally excluded, and though the rates used were often high, yet the cultivator submitted to them ungrudgingly. At present, however, he has to pay assessment on all lands in his possession, fallow lands as well as those which he has actually cultivated. As a general rule, lands which bear dry crops, and those situated near the foot of mountains and hills, are cultivated by rotation, intervals of rest being deemed necessary to enable them to recover their usual powers of production, and sometimes to suit the convenience of the landholder. In this manner a large quantity of land remains uncultivated, and yet the cultivator has to pay his assessment indiscriminately for all lands at the rates fixed. The present rates are generally fair, and are in the long run likely to prove beneficial to an intelligent, careful, and provident peasantry. But the sensitiveness of an ignorant ryot to a present grievance, however slight, is somewhat keen, and he is not shrewd enough to discover the advantages of a system to realise which the profits and losses of several years have to be taken into account, and which, moreover, in many cases are rendered almost nugatory owing to his ignorance and improvidence.

For the purposes of a direct reference, a few typical instances of cultivators stating the number of persons in their families, the quantity of land in their possession, the produce of their lands, the assessments, and other important particulars of their economic condition, are given below for some of the districts from which information has been obtained. The value of karbee (straw) is included, but not miscellaneous items.

Belgaum.—Shidappa bin Takappa Terni is an inhabitant of Shirgaum, in the Belgaum collectorate, and has in his possession 119 acres and 22 gunthas of land, which is represented to yield an annual income of Rs. 1,706, the amount of assessment payable being Rs. 111.9.0. His family consists of 24 members, and he has 31 head of cattle. His expenses on agriculture amount to about Rs. 150, and he has to spend about Rs. 351 in purchasing articles which he cannot produce on his lands. His extraordinary expenses amount to about Rs. 100. His estate is worth about Rs. 4,000, and the store of grain about Rs. 500. He is considered to be in well-to-do circumstances.

Balu bin Linggouda, Pátel, is an inhabitant of Danwad, in the same collectorate. His holdings amount to 30 acres and 35 gunthas, which give him an annual income of Rs. 245, while he has to pay in the shape of assessments Rs. 22.5.0. His family consists of 11 members, and he has 7 head of cattle. His expenses on agriculture amount to Rs. 15.10.0, and he spends Rs. 113.8.0 in buying things which cannot be produced on his lands. His estate is worth Rs. 50, and he has no store of grain. His debts are put down at

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* The average income of a ryot and his average indebtedness stood in the proportion of 4 to 5.

Mahade Wasude Barvé.

Rs. 345, and he might be said to be in bad circumstances.

Balgouda Gingouda, Patel, is an inhabitant of Nandgaum, in the Athani taluka, and holds 636 acres and 12 gunthas of land, which yields him an income of Rs. 2,932, while he has to pay Rs. 403 as assessment. His family consists of 20 members, and his cattle are 71. His expenses on agriculture amount to Rs. 480, and he spends Rs. 266 in the purchase of things which he cannot produce on his lands. His estate is worth Rs. 3,400, and his store of grain is worth about Rs. 750. He is in good circumstances.

Balgouda bin Amgouda, Patil, is an inhabitant of Ainapur, a village in the Athani taluka, and has in his possession 168 acres and 8 gunthas of land, which yields him an annual income of Rs. 1,264, while he has to pay Rs. 133.11.0 as assessment. His family consists of 34 members, and he has 31 head of cattle. His expenses on agriculture amount to Rs. 280, and he spends Rs. 389 in purchasing necessaries which he cannot produce on his lands. His estate is worth about Rs. 150, and he has no store of grain; his debts are put down at Rs. 1,000, and he is considered to be in middling circumstances.

Basana bin Ningana Siduhal is an inhabitant of Sampgaum, in the Belgaum collectorate, and has 65 acres of land in his possession, which yields him an annual income of Rs. 343, while he has to pay as assessment Rs. 92.7.0. His family consists of 10 members, and he owns 18 head of cattle. His expenses on agriculture amount to Rs. 90. and he spends Rs. 106 in buying necessaries which cannot be produced on his lands; while his extraordinary expenses are put down at Rs. 51.9.0. His estate is worth Rs. 1,041, and the store of grain in his possession is worth about Rs. 342. He is represented to be in good circumstances.

Baslinga bin Basana Chawati is an inhabitant of the same village, and holds 10 acres and 13 gunthas of land, which yields him an annual income of Rs. 52.8.0, while he has to pay as assessment Rs. 15.15.0. His family consists of eight members, and he has in his possession five head of cattle. He spends nothing on agriculture, but is required to spend Rs. 129.12.0 in purchasing necessaries which he cannot produce on his lands. His estate is worth Rs. 8; he has no grain in store, and his debts are put down at Rs. 200. He is evidently in bad circumstances.

Native States. Kolhapur. — Bapu bin Ambaji Mali is an inhabitant of Shiradwad, in the Ichalkaranji State of the Kolhapur territory. He has in his possession 50 acres and 37 gunthas of land, which yields an annual income of Rs. 875. The assessment on his land is Rs. 122.1.0, while his expenses on agriculture amount to Rs. 210. He has a family consisting of 26 members, and he owns 33 head of cattle. He spends Rs. 421 in purchasing necessaries which cannot be produced on his land, while his other expenses are put down at Rs. 62. His estate is worth Rs. 400, and he has a stock of grain valued at Rs. 180. His debts amount to Rs. 1,600, and he is said to be in good circumstances.

Dhondi bin Govinda Mane is an inhabitant of Jakhale, in Peta Panhala of the Kolhapur territory. He holds 25 acres and 10 gunthas of land, which give an annual income of Rs. 290. He pays Rs. 114.2.0 as assessment, and he spends Rs. 72 on agriculture. His family consists of four members, while the head of cattle in his possession are seven in number. He spends Rs. 26 in purchasing things not grown on his land. His estate is said to be worth Rs. 10, and his debts are put down at Rs. 400. He is represented to be in middling circumstances.

Babaji bin Yesu Kothar is an inhabitant of Sakbari, in the Baura state of the Kolhapur territory. He possesses 3 acres and 30 gunthas of land, which yields him an annual income of Rs. 57. He pays Rs. 26 9 0 in the shape of assessment. His family consists of six members, and he has only one head of cattle. He spends Rs. 19 in purchasing things not grown on his land. His debts are put down at Rs. 100. He is said to be in bad circumstances.

The above instances will suffice. Of the several districts the condition of whose ryots is described above Belgaum, Sattara, and the native state of Kolhapur are blessed with a soil and a climate very favourable for agricultural purposes. They are mostly situated near the Western Ghats, and are intersected with rich valleys and watered with ever running streams. The rainfall in these districts is generally sufficient. The districts of Dharwar, Kaladgi, and a portion of the Belgaum Collectorate and the native states of Miraj, Sangli, Mudhol, Jamkhandi, &c. have a rich black Deccan soil, but the rainfall is here fitful, and the facilities of irrigation therefore uncertain. The districts of Ratnagiri and Kolaba are situated on the coast below the ghats, and generally enjoy a copious rainfall. The monsoons burst here first in the Presidency, but the soil is for the most part rocky and poor. The Kolaba district is not so badly off in this respect as Ratnagiri, but the soil in both is vastly inferior to the districts above the ghats.

These physical peculiarities have differently affected the character of the ryots residing in different districts. The poverty of the soil below the ghats has stimulated the industry of the cultivator, while the fertile plains in Dharwar and other districts have fostered indolence in their occupants. The former is parsimonious, careful, and enterprising, and the Deccan ryot is extravagant, improvident, and sluggish; for the black soil fields with comparatively less labour give plentiful returns to their owners, while the poor ryot below the ghats, notwithstanding his exertions all the year round, is scarcely able to earn a decent subsistence.

There does not appear to exist any striking contrast in the condition of the ryot in a Native State as compared with that of his brother in the British districts, for, owing to long minorities, the territories of native Rajas and chiefs on this side have been managed directly or indirectly by British officers for several years past, and consequently the system of administration has been gradually made to assimilate with that obtaining in the districts directly under the British rule. It is only in those Native States which have long remained under an indigenous administration that materials for an instructive and interesting comparison would be available.

Mr. P

What is the condition of the agricultural population, and if depressed, what is the reason of their depression? Is it a fact that there is no net produce and that the land assessment is a tax on the wages of the ryot's labour? What does a ryot family spend yearly according to its present standard of comfort, and what proportion is this of the gross produce of an average holding? What proportion do the cost of cultivation and the land assessment bear to the same?

The present assessment of land in Bombay is based on a careful study of the past history of each district, what revenue has been demanded, what paid, and with what effect on its prosperity; that is to say, the basis is the rent which the district is found to have paid in past times without retrograding. This rent is apportioned among and assessed on the fields by an elaborate calculation of the quality and position of the land. For land watered by the rain in the Deccan districts the highest average rate per acre is Rs. 1.1.10, and the lowest 6 annas 8 pies; in Guzerat the highest Rs. 4.3.11, the lowest Rs. 1.3.5. Inferior land is assessed as low as three farthings per acre, and very inferior land is not assessed at all, as being unable to pay any rent. Garden and rice land pay a higher rate. The assessment is thus strictly a rent. The rent is fixed for each field, and it is at the option of the ryot to take up any field or resign it. If an increased extension of cultivation is any test, the Bombay settlement must be pronounced liberal and judicious. But as enlarged cultivation may be due

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to increased population, and the peasantry are not in a position to indicate excess in the rents by leaving the fields unlet, it is necessary to have recourse to other criteria.

Private rents form one criterion. The incidence of the Government assessment on land has been ascertained by careful experiments to be less than one-sixth of the gross return on very ordinary cultivation. The new cash rents of the Bhownagar State are about one-third of the gross produce, in some districts more, and yet the state is very flourishing. The talukdars of Ahmedabad, after a few deductions, divide the entire gross produce with their tenants in equal shares, yet they have no difficulty in keeping their tenants. The rule between the khotes of the Concan and their tenants is that the produce rent is not to exceed half the gross produce of rice, yet the khotes retain their tenants. That is to say, about three times the Government assessment may be taken without forcing the tenants to give up the land. The recent careful crop valuations give the value of gross produce in a large number of instances. On a field of wheat in Poona, the Government assessment is 8 annas per acre, the value of the crop is Rs. 28 7 0 per acre, and the private metayer rent would be at least Rs. 12 per acre. In an inferior crop the assessment is Re. 1 4 0 per acre, the value of the crop Rs. 11 per acre, and the private metayer rent would be about Rs. 5 per acre. In rice lands in Canara, the experiments give Rs. 74 8 0, Rs. 62 4 0, Rs. 44 6 0 as the value of the crop per acre on various fields, whereon the assessment is Rs. 2 3 6, Rs. 2 3 6, and Rs. 3 11 0 per acre.

Of course the produce rent varies with the season. But if Rs. 12, Rs. 6, and 0, are taken as the produce in a good, a middling, and a bad season, of an acre assessed at Re. 1, the produce rent on the three years will be about Rs. 8, while the Government assessment will be Rs. 3.

An inspection of the cases of individual ryots collected by Mr. Barvé leads to the conclusion that the assessment is not an oppressive proportion of the ryot's necessary expenditure. Of course good cultivation will make it a much more trifling proportion than bad cultivation. The merest quit-rent will be heavy to an idle and slovenly cultivator. It seems fair to argue on the results of tolerable industry and skill.

It is evident that the present assessments are far less than the produce rents sanctioned by immemorial custom, and that even the last are paid and yet allow a subsistence to the tenants of private proprietors.

It is said that the produce rents are popular because they adjust themselves to bad seasons; the tenant pays when he has wherewith to pay, and not when he has not. This suits the people. On the other hand the customary Indian produce rent keeps inferior lands out of cultivation, and taxes the earnings of superior skill and industry. These are evils. And the advantage of an elastic rent may be secured in case of the Government land revenue, by a moderate use of the plan of suspending collections in bad years, so that the ryot may pay, say 8 annas in a bad year and Re. 1 8 0 in a good year following, in lieu of Re. 1 in each of the two years.

The average production of food grains per acre has sometimes been assumed as Rs. 4 Indian maund, and the value Rs. 7 per acre. But 4 maunds is much below the average production, and, as the result of a number of experiments, it appears that the average value of gross produce (including straw) was, for wheat, in one experiment Rs. 19 per acre, in another Rs. 11, in a third Rs. 27, in a fourth Rs. 15; for joár, in one experiment Rs. 10, in a second Rs. 14; for rice, in one experiment Rs. 36, in another Rs. 27, in a third Rs. 44; for ragi, Rs. 27 per acre. The assessment bears to gross produce in these cases the proportion of $\frac{1}{10}$, $\frac{1}{12}$, $\frac{1}{13}$, $\frac{1}{14}$, $\frac{1}{18}$, $\frac{1}{29}$.

In the instances collected by Mr. Barvé, the average income from land admitted by the British ryots questioned is Rs. 9 per acre, and while the lowest is Rs. 4½, the highest is Rs. 25 per acre.

The expenses of cultivation are also commonly over-estimated. Mr. Stormont, manager of the Government farm in Khandesh, states the amount of seed used at 6 lbs. per acre for bajra, 3 lbs. for joári, 48 lbs. for wheat.

Then as to cash spent for labour. Mr. Barvé's examinees state it at a fraction over 1 rupee per acre on the average. The fact is that the ryot has the labour of his own family and ryots help each other. The expenditure in coin on farm labour in small holdings is very trifling.

If these data are applied to the average Deccan holding of 40 acres consisting of fair dry crop land * assessed at 1 rupee per acre, the result is as follows:—

	Rs.	a.	p.	Rs.	a	p.
Gross produce of 40 acres, at Rs. 9 per acre.				360	0	0
Deduct—						
Assessment - -	40	0	0			
Local cess - -	2	8	0			
Seed at 6 lbs. per acre = 240 lbs., at 30 lbs. per rupee.	8	0	0			
Interest and depreciation on estate of Rs. 215.†	40	0	0			
Labour at 1 rupee per acre.	40	0	0	130	8	0
Balance for ryot's living - -				229	0	0

What then does it cost a family of, say, six people to live?

A table prepared by Mr. Barvé from the results of careful observation (printed below) shows that the food of a middle class adult cultivator on full diet costs 2 annas ‡ a day with grain at 32 lbs. per rupee. The food of a labourer costs 1½ annas a day, in the Concan even less. If the family consists of four adults and two children, his outside daily expense is 10 annas, or Rs. 228 for the year for the middle class cultivator, and 8 annas a day or Rs. 180 per annum for the labourer. Scarcity is habitually met by reducing the quantity of food.

The actual transactions, however, may be better represented thus:—

	Lbs.	Lbs.
Gross produce at 5 maunds of 82 lbs. per acre on 40 acres.		16,400
Deduct—		
Seed at 6 lbs. per acre - -	240	
Food 10 lbs. per diem - -	3,650	3,890
Balance of produce available for sale -		12,510

	Rs.	a.	p.	Rs.	a.	p.
This is worth at wholesale price, 40 lbs. per rupee - - -				312	12	0
Deduct— Expenditure in cash—						
Assessment - -	40	0	0			
Local cess - -	2	8	0			
Labourer - -	40	0	0			
Replacement of implements, &c.	40	0	0			
Purchase of condiments, &c., according to table, at 3 annas 8 pies per diem.	83	10	4			
				206	2	4
				106	9	8

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* The average dry crop rate is 9 annas.

† The calculation of the Deccan Riots Commission.

‡ Deducting the charge for fuel, which is collected, not bought.

The margin for clothes, ornaments, ceremonies, repayment of debt, is thus Rs. 106.9.8.* The ryot has besides the straw of his grain crop and the grass on the margin of his fields to feed his cattle with or sell. The cattle give him milk, fuel (cowdung), manure, butter, and ghó. The women earn some cotton for picking and spin it into yarn, and the men earn hire as carriers, when not engaged in their fields.

It will be observed that; allowing for bad and good farming and the presence or absence of debt, the above calculation tallies pretty nearly with Mr. Barvé's typical instances, and appears to be a fair statement of a middling ryot's condition in an average year.

It may be thought too favourable to be consistent with the known indebtedness of the peasantry. As to that, the fact seems to be that no one is less familiar with the above calculation than the ryot himself.

The peasant keeps no accounts; all his transactions are in the books of the village saucar and purveyor, into whose store the surplus passes and from whose store supplies are drawn. Grain is credited at a low valuation, and money advanced at high interest. The balance is commonly against the peasant, for every peasant has experienced a year now and then when the margin of surplus was wanting and supplies were obtained on credit. The effect of a fall in prices or a series of bad seasons on the above relations is obvious. The debit balance once started is manipulated by the saucar. At best, few of the peasants ever get a clear view of themselves as independent yeomen possessed of a little capital applicable to improvements; their idea of the connection between the grower and purchaser of produce takes the form of a running loan account. Their minds are never worked upon by the charm of possession, and it is natural that they should be apathetic and unenterprising. Of course there are well-to-do peasants who are not thus enslaved, nor is the system incompatible with the possession by all but the most bankrupt ryots of ornaments which come into use as a resource in time of famine, as was remarkably proved in 1876-77. But the system seems to exist everywhere, and is most powerful where the soil is poorest and other conditions of cultivation most unfavourable. It is not to be concluded that the ryot is therefore habitually miserable or desperate. It is the state of things to which he and his fathers were born and bred, and the effort to be self-reliant and enterprising would no doubt be to him much more uncomfortable than drifting in the hands of the village factotum.

It is a curious fact, but it is generally agreed that the great rise in prices at the time of the American war (1862-7), which would have emancipated a sagacious and provident peasantry from debt, actually added to the indebtedness of the Deccan ryots, as it inflated their credit and led them into extravagance. Another cause assigned on good authority for their embarrassments is the indifference and thriftlessnes caused by the caprice of the rainfall, which gives now a year of great plenty and again a year in which the crop is insufficient to furnish the ryot's food and necessary cash payments.

Unfortunately the assumption of the Bombay Survey Settlement was that the peasant would be found capable of forethought, energy, and self-reliance. He has not proved so, and the experiment has failed. It is now asked whether the boon of heritable and transferable property in the land a ryot holds, so long as he pays the assessment, should not be withdrawn so far as to prohibit the sale of occupancy right for debt.

The heritable and transferable right is the point in which the British ryot differs from the tenant of a Native ruler. The latter pays a much higher assessment, and both are about equally in debt, but the Native ruler would never allow his land to be put up to auction for the benefit of the tenant's creditors. The credit of his ryot is therefore smaller. The ryot is a valuable chattel, and the saucar is not allowed to press the ryot by aid of the more rigorous process of the chief's civil court.

It seems hardly possible for the Government to resume a proprietary right in the land which it has formally ceded to the peasantry. Nor is this measure so unmixedly expedient as to recommend itself strongly, if what is amiss in the ryot's condition can be remedied in any other way. Perhaps the failure above noted is capable of yet being retrieved if the system is as sound as it is believed to be.

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* The Survey Commissioner in an independent calculation makes the margin on a similar holding with the same number of persons living on it, Rs.143 80.

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ARTICLES required to make up the ordinary Meals of a Field Cultivator and Labourer in the Deccan, and of a Kunbi in the Konkan.

No.	Names of Articles.	Poona, Middling Maratha Cultivator.				Poona Kunbi Labourer.						Kunbi of Kolhapur.				Kunbi of Ratnagiri.				
		Grown up and working Male and Female.		Boy of 10 years.		Grown up Male.		Grown up Female.		Boy of 10 Years.		Grown up Man.		Boy.		Grown up.			Boy.	
		Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.	Weight.	Value.		Weight.	Value.
			A. P.		A. P.		A. P.		A. P.		A. P.		A. P.		A. P.		A. P.			A. P.
1	Rice, 2nd sort	½ lb.	0 6	1 lb.	0 6	—	—	—	—	—	—	—	—	—	—	—	—		—	—
2	Joari, 2nd sort	1½ lb.	0 9			2 lb.	1 0	2 lbs.	—	1 lb.	0 6	1 lb.	0 6	—	—	—	—		—	—
3	Bajra	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
4	Wheat	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
5	Gram	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
6	Rági or Nachni	—	—	—	—	—	—	—	—	—	—	1 lb.	0 6	—	—	2 lbs.	0 11		—	—
7	Ghi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
8	Oil	180 gr.	0 1	90 gr.	0 ½	180 gr.	0 1	—	—	—	0 ½	180 gr.	0 1	—	—	180 gr.	0 1		—	—
9	Salt	400 gr.	0 1	180 gr.	0 ½	400 gr.	0 1	—	—	—	0 ½	400 gr.	0 1	—	—	360 gr.	0 ¾		—	—
10	Vegetables or pulse	About 4 oz.	0 3	—	0 1	—	0 3	—	—	—	0 1	—	0 3	—	—	—	0 3		—	—
11	Milk	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
12	Kokamb or Tamarind	1⅔ oz.	0 4	—	0 2	540 gr. 1¼ oz.	0 3	—	—	—	0 2	540 gr.	0 3	—	—	540 gr.	0 3		—	—
13	Cocoanut kernel																			
14	Chilly powder																			
15	Turmeric																			
16	Coriander																			
17	Jira																			
18	Asafœtida																			
19	Onions																			
20	Garlic																			
21	Salt fish																			
22	Jagri	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—	—
23	Fuel	3 lbs.	0 3	—	—	3 lbs.	0 3	—	—	—	—	3 lbs.	0 3*	—	—	3 lbs.	0 3*		—	—
			2 3 30		0 10 30		1 11 30		—		0 10 30		1 11 30		—		1·9¾ 30	—0·3—		1 6¾ 30
			Rs. 4 3 6		Rs. 1 9 0		Rs. 3 9 6				Rs. 1 9 0		Rs. 3 9 6				Rs. 3 8 0			Rs. 2 14 8

PRICES.—Rice at 16 lbs. to the rupee.
Joari, 32 " "
Bajra, 36 " "
Nachni, 32 " "

* This charge is generally avoided by collecting fuel here and there.

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Sindh.

Col. Haig.

SINDH.

Dividing the agricultural population into larger and smaller holders, it may be said that the former are nearly all heavily encumbered with debt. The latter are, as a rule, indebted, but to a less extent in proportion to their means than the larger holders, who are for the most part wanting in the thrift and energy essential to success in agriculture, and too frequently extravagant and dissipated.

I subjoin two instances taken from the tribe of Shekhs, in the Sukkur taluka. The information was collected by a trustworthy employé of this department while revision operations were in progress a few years ago. A family consisting of two men (brothers), the son of one of them, a boy, two women, and five young girls; in all 10 persons. Their property consists of four bullocks, two cows, and a cart. They cultivate—

	A.	G.
Land irrigated by well and under superior crops.	0	30
Land irrigated by well and under wheat -	1	20
Land irrigated by flow from canal under wheat.	2	20
Land irrigated by flow from canal under joari.	2	20
Total -	7	10

The average cereal produce is—	Mds.
Wheat - - - - -	52½
Joár - - - - -	29
Total -	81½

The annual consumption of the family is -	60
And seed required - - - -	9½
Total -	69½
Balance sold - - - - -	12

The produce of superior crops is—	Rs.
Ghur, 30 maunds, at Rs. 6 - -	180
Tobacco, 18 „ at „ 5 - -	90
Total -	Rs. 270
Add 12 maunds of grain at Re. 1 8 0 -	18
Total money income from the land -	288

Deduct expenditure—	Rs.	
Manure, cane-seed, preparation of ghur, and assessment.	144	
Provisions, such as fish, meats, sweetmeats, and condiments.	51	
Clothing - - - - -	35	
		230
Balance -		Rs. 58

Other income—	Rs.	
Sale of butter - - -	11	
Earned by the women (spinning) -	24	
Carting for about two months -	30	
		65
Total net income -		Rs. 123

The family live in a house worth about Rs. 200, and are free from debt.

In the next case the family consists of two men, the wife of one of them, two boys (about 10 years old), and four girls,—in all nine persons. They cultivate—

	A.	G.
Well-irrigated land under superior crops -	0	30
Well-irrigated land under wheat - -	1	0
Irrigated by flow from canal under wheat	2	0
Irrigated by flow from canal under joari -	1	10
Irrigated by lift from canal under joari -	1	20
Total - -	6	20

The average yield of cereal produce is—	Mds.
Wheat - - - - -	39
Joár - - - - - -	36
Total - - -	75

The consumption of the family is—	Mds.	Srs.
Grain - - - - - -	54	39
Seed required - - - - -	7	27
Total - - - -	62	17
Balance of grain sold - - -	12	23

	Rs.	a.	p.
Ghur and tobacco fetch - - -	270	0	0
Grain, 12½ Mds., at Re. 1 8 -	18	12	0
Karbi (joar straw) - -	10	0	0
Total money income from land -	298	12	0

Deduct expenditure—	Rs.	a.	p.
Cane-seed, manure, oil-cake, preparing ghur, and assessment.	146	0	0
Provisions purchased - -	46	0	0
Clothing - - - - -	30	0	0
Total Rs. - -	222	0	0
Balance of income - - -	76	12	0

Other income—				
Sale of butter - -	Rs. 11			
Earned by women - -	„ 12			
	—	23	0	0
Total net income -		99	12	0

The family live in a house worth Rs. 150, and are free from debt.

The above information may be considered trustworthy. I hesitate to give other instances, as generally so little reliance can be placed on the accounts given of their condition by the people themselves. I should roughly estimate that four-fifths of the agriculturists of the Province are more or less in debt.

ap. I. Qn. 9.

Madras.

Mr. Price.

. Goodrich.

MADRAS.

Mr. Price.—Cuddapah.—As a rule, in this district the cultivators, whether proprietors or occupying farmers, look mainly to the land as their means of subsistence. I do not in this category include the holders of puttahs below Rs. 10, as these can hardly be held to be farmers in the proper sense of the word.

The ordinary ryot lives upon the produce of his land. Where he is a small holder, all the members of his family assist in agricultural operations; where he is a man of some substance, he employs, upon a monthly salary, farm-labourers to the extent that he requires. Any surplus remaining after deducting the cost of maintenance and the payment of the revenue due to Government or of the rent to the landlord is devoted to the purchase of clothing and petty luxuries. Any balance which then remains is spent either in acquiring cattle or land, or, if the ryot thinks that he has enough of these, is either buried or converted into jewels for the females of his family. It is only when the ryot has acquired as much as he thinks necessary in the way of cattle, land, and jewels, that, if he does not bury his money, he assumes the character of money-lender, and gives loans at heavy interest to his less fortunate brethren.

One peculiarity of the rustic of Southern India is his fondness for borrowing. He wishes to marry his daughter or to bury a relative and perform the funeral ceremonies, his riches consisting chiefly in grain, cattle, and so on; he goes to the village saucar or the money-lending ryot, and borrows what is a comparatively high sum. It is a point of honour with him not to be niggardly in his display on such occasions, and he will obtain a loan for this purpose out of all proportion to his financial position, and incur thereby responsibilities which will hamper him for years.

Take, for instance, the following case: Although last year was one of famine, and he cannot be called a rich man, he spent Rs. 300 on his father's funeral ceremonies. He is a respectable individual of the fairly well-to-do ryot class, and this fact no doubt led him into a decided extravagance. Had he been economical, the village would have commented upon it, and he been put to shame.

I know for a fact that during the famine in the Cuddapah District, any one but a substantial ryot could not obtain a loan. I often made inquiries of the people on this point, and the almost constant reply was that the saucars said that land was of no value, and that the cases of "alive to-day, dead to-morrow" were so frequent that they would not lend without substantial security. Indebtedness is undoubtedly an institution of rural life in India; but I do not think that it is, as a rule, the result of the want of means of living, so much as of the inexplicable extravagance which mingles with marked economy in the life of the people of this country.

What the degree of indebtedness of the cultivating classes is, it is not possible for one to say or even estimate with any degree of useful accuracy. The period through which the country has passed has been of the most abnormal character, and the people have, since the famine has taken a turn for the better, gone to the money-lender for the means of starting again. The law courts are no test of the extent to which this has taken place, for the major part of these transactions will never appear before them, the loans having been received from wealthier ryots, friends, or relatives. I asked the most intelligent native that I know in the district what he thought, and though himself a man of the legal profession, he told me that he could form no opinion.

Mr. Wilson.—Kistna.—I can answer this question only in the most general manner, and only with reference to the district I know best, the Kistna.

The ryots of the delta-irrigated villages of this district are as a rule in most comfortable circumstances; not a few are rich, and combine commercial with agricultural pursuits. The generality of the upland ryots are in fair circumstances so far as can be judged from external appearances; they are strong, hearty, and healthy to look at. With hardly an exception every ryot, even the poorest, owns his own ploughing cattle and implements of agriculture. There are few of the well-to-do ryots who do not own at least one bandy; those chiefly in use in the western taluks are known as "Oopara bandloo," small carts with wheels of solid stone or wood; they are not used much beyond the limits of the village. In the delta the dwelling-houses are chiefly of mud roofed with tiles or thatch; in places the ordinary mud hut has given way to a considerable extent to buildings of a more substantial character. In the western taluks the houses are of mud, or of stones in mud, with flat roofs constructed of wattle and dab.

I can give no opinion regarding the extent of the indebtedness of the ryots, but I know from my experience as a judge that the poorer classes of ryots are generally in the hands of the village saucar, who advances the expenses necessary for cultivation, recovering them in kind at a much lower value than the market rate of the day.

Mr. Goodrich.—A ryot paying an annual assessment of Rs. 100 spends about Rs. 50 in manuring land, paying wages to hired labourers, purchasing salt and other expenses paid for in cash. The value of the out-turn on the land may be estimated at Rs. 300. After deducting from this amount the annual rent and the land-cess (at the rate of half anna in the rupee) there remains a balance of Rs. 150. Of this Rs. 100 will go towards household expenses and maintenance of his family, whose labour is the mainstay of the farm. The balance is spent either in lending, in paying interest on old debts, or in purchasing ornaments, or in celebrating marriages. The above estimate refers only to cases where the ryot gets an average crop. If the crops fail so that he has not a saleable surplus to the amount of his sist, he will be obliged to borrow to pay the sist and must stint himself in food. The ryots in most cases have large families, consisting of from 10 to 20 souls. They all work in the field, and hired labour is employed only at the time of transplantation and reaping. They generally live in thatched houses containing two or three terraced rooms (with clay ceilings and a thatch over all) to suit the requirements of the family. A ryot paying Rs. 100 rent keeps two or three pairs of bullocks and one or two cows, whose calves he sells. It used to be estimated that about one-third of the families in the district were in debt, their debts amounting to half of their annual income.

It is believed that recent high prices have very greatly reduced the debts of the class.

The following statement has been compiled from the only tabular returns of typical instances furnished by district officers in Madras Presidency.

The returns are very defective, no information regarding the consumption of food grains nor miscellaneous income (except incidentally in the case of the Kistna district) being included. The former omission has been approximately made good from statements furnished by the Board of Revenue of the average consumption of food grain per head, of seed per acre, and of the average value of each kind of grain in the districts in question.

The accuracy, however, of the statement is at best very questionable.

Madras.—Economic Condition of the Agricultural Population.

—		Kistna District.	Nellore District.
1. Number of holdings enquired into		7	10
2. Average number of persons in family		7·857	8
3. „ „ cultivated acres	per holding	34·857	25·238
4. „ out-turn of food grain	„	Kandies 11·628	Kandies 15· 3
5. „ consumption of food, grain and seed	„	„ 8·892	„ 9·38
6. „ amount of surplus food	„	„ 2·736	5·92
7. „ value of „ „	„	Rs. 104·181	Rs. 122·437
8. „ net value of non-food grains	„	„ 31·857	„ 17·65
9. „ amount of other miscellaneous income	„	„ 24·285	—
10. „ total cash income over and above consumption	„	„ 160·323	140·087
Outgoings.			
11. „ revenue, rent, and cesses	„	„ 114·035	Rs. 117·863
12. „ payments for hired labour and village menials	„	„ 89·142	„ 101·05
13. „ expenditure on non-homegrown necessaries	„	„ 33·571	„ 88·
14. „ total outgoings	„	„ 236·748	„ 306·913
15. „ surplus or deficit of income over outgoings	„	„ 76·425	„ 166·826
16. „ number of cattle :			
Oxen		7·428	6·6
Cows		4·142	14·2
Other animals		6·285	12·4
Total		17·855	33·2
17. „ possessions, value of :			
Grain		Rs. 46·857	Rs. 11
Ornaments and cash		„ 892·857	259
Chattels		„ 34·857	53
Total		Rs. 974·671	Rs. 323
18. Number of persons indebted		4	8
19. Average amount of debt		Rs. 300	Rs. 737·5

MYSORE.

Mysor

Colone Pearse

The ordinary ryot rarely if ever spends any large sums on what might be called luxuries or extravagancies; his chief expenses are the purchase of cattle, the purchase of clothes for his family, and of a few ordinary silver jewels for the women, and the usual expenditure on the occasion of a marriage or other ceremony. He lives almost entirely on his own produce. He generally keeps a moderate stock in hand, and the rest he disposes of and hoards the money, and after a series of good seasons there are few Mysore ryots who have not got coin buried in their houses of greater or less amount, and this is one of the reasons why, through the whole of the late prolonged famine, the cultivating ryots had as a rule sufficient to enable them to maintain themselves and their families, whilst the artizans and labouring population, who mostly live from hand to mouth, have died in thousands. In the earlier months of the famine, though many ryots came to relief works, the holder of a puttah rarely if ever came to a feeding establishment.

The ordinary ryots almost invariably sell their share of the rice crop, as they depend upon the dry crop for the support of themselves and their families. I also exclude grazing land from the extent of the holding, as in all unsettled taluks, and even in settled taluks during the famine, such lands were made free to the villagers, therefore the ordinary cultivator has been able to graze his live stock, consisting generally of two or three pairs of bullocks, some cows and she buffaloes free of cost, or at a very trifling charge, without let or hindrance over the extent available in the vicinity. The smaller ryots avoid the employment of hired labour as much as possible; they may have one or two low-caste servants permanently on the establishment, but as their families are usually large, ranging from five to 10, and as all are made to work, the bulk of the extra labour is employed by possessors of large holdings only.

The women and children of the ordinary cultivator also contribute largely by other means to the family earnings. Throughout the year, whenever they are not employed on field labour, they cut grass and take it to the large villages and towns for sale. They also collect and carry minor produce, such as fruit, vegetables, chillies, dairy produce, woollen thread which they have spun, and sundry other articles, to the different fairs held in the vicinity. In fact every member of the family is bound to give assistance to the best of his or her ability, and industry and frugality are the leading characteristics of a ryot's household in this part of the country.

The ordinary rates of assessment per acre are for—

Wet	6	0	0
Dry	1	8	0
Garden	9	0	0
Grazing land, when rented	0	7	0

The ryot's house generally consists of one block divided into several rooms, with cattle sheds and a granary, or sometimes grain pits dug in the cattle-shed. The house is generally built of thick walls of glutinous mud with a thatched or flat roof, and prior to the famine tiled houses were to be seen in almost every large village, which showed that the people were prosperous and had money to spare for such purposes.

Until the recent calamity came upon them it was quite proverbial that even the smallest landholders or puttahdars were well-to-do, and the per-centage of those in debt was known to be very small indeed. This was made evident by the almost entire absence of poverty in the villages, by the people being invariably well clad and well nurtured, and by the fact that there was little or no arrears of revenue. The kists, in so far as the cultivating ryots were concerned, being paid punctually; the defaulters, as a rule, being either non-agriculturists, middlemen, or public servants who held lands and were liable for candayem.

P. I. QN. 9.

MYSORE.

olonel Hay.

As contrasted with 1848–49, the number of registered cultivators has risen from 120,114 to 211,732, being nearly 76 per cent. The area under cultivation has similarly increased from 758,213 acres to 1,159,820 acres, the difference being 401,607 acres, or nearly 52 per cent.; but the average area under cultivation per head of the total number of registered cultivators has fallen to some extent, that is, a cultivating ryot had on an average 6·37 acres in 1848–49, or about 30 years ago, whereas the average is now not more than 5·20 acres. This coincides with the generally received opinion that increase of cultivation has risen much more from petty ryots, labourers, and others taking up small portions of land than from the size of the holdings having increased. Many causes have contributed to this: population increased, the savings of those who have earned money on the coffee estates and in other ways have enabled them to start on their own account, the battai system has been abolished, restrictions in taking up and resigning lands removed, and prices of agricultural produce have risen; and the majority of those who save a little money prefer to set up for themselves rather than work under others. Hence the larger holders find it more difficult to get land and labour than formerly, and are unable to extend their holdings as they might perhaps wish to do.

There can be very little doubt that within the last 40 years, the position of the ryots has generally improved. During the early years of the late Maha Rajah, their condition deteriorated in consequence of a general fall in the prices of agricultural produce occasioned by the reduction in the number of troops, and from the want of occupation to the same extent as before of classes of people not agricultural, and low prices continued until communications were opened in every direction, and a demand arose on the east from the collectorates of the Madras Presidency and on the west from the Coffee District extending from Magar in the north to the Neilgherries in the south, and including Munjarabad, Coorg, Manantoddy, and Wynad.

It would certainly be supposed that when the great majority of the agricultural classes pay such small sums, the bulk of the people would be paupers, just able to pay their cesses in a good year and on the verge of starvation in a bad one, but the experience of the late famine following on several bad seasons shows that many even of this class had more resources of their own than was supposed, or that they were able to obtain support from others.

It is admitted universally that the condition of the ryots has improved for a series of years past, and that this is apparent in their houses, utensils, clothing, and ornaments; that the standard of living has been raised; that capital has increased, and that the wages of agricultural servants have risen.

With regard to the amount to which ryots are indebted, different accounts are given in different places, and debts are of varied character. In many cases temporary loans are contracted, which are repaid within the year, and in others the family becomes permanently burdened. Loans in grain or money are constantly made by the richer ryots to poor men of their village, but this is in many cases as much for the sake of retaining the services ot the borrower as an investment.

No absolute rule can be laid down as to the disposal of any surplus income. Generally a ryot looks in the first place to growing sufficient grains for his own wants, storing as much as possible as a reserve, and selling his other produce for cash. Formerly grain was hoarded to a large extent, but high prices tempted the people to dispose of it, and the practice is much less common now, although in the opinion of many the risk of famine was much lessened by the former usage. Savings are first invested in ornaments, and are said to be seldom applied to marriage expenses, for which the resource is borrowing. The gold and silver ornaments accumulated in past years saved many families from starvation during the late famine. I cannot give any exact statement of the proportion of the agriculturists in this division who are in debt, or what proportion their average indebtedness bears to their average yearly income. The number must have increased during the famine, but I have been surprised to hear in several places that fresh debt so increased was much less than would have been supposed, and the explanation given is that the people maintained themselves to the last by the sale of cattle, sheep, and ornaments, and that the prospects of the year were so bad that loans were not procurable.

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jor W. Hill.

The greater part of the Mysore country is an undulating plain with a red soil, well suited for the growth of cereal crops, which are dependent on the ordinary showers of rain, which fall between the months of June and November. The cultivators of such lands, which are known by the term Kushki (dry), are much the most numerous. The cultivators of Tari (wet) lands under tanks, and in the Malnad (rainy country bordering on the western ghâts) are comparatively few in number. The following remarks may be held to apply chiefly to the economic condition of the ryot holding land in the Maidan (open country) directly from Government. The most marked features in their tenure is the very great number of petty holdings. In this district the average holding of a ryot is 15 acres in the Maidan and 30 in the Malnad. Unquestionably by such a system a comparatively large number of inhabitants is supported by the soil; but they are in a state little removed above penury. So far as the theory supported by Mill of the advantage of small holdings applies to Mysore, it is a mistake to imagine that the tenure leads to any great development of the resources of the land, or to greater attention being given to agriculture: on the contrary the smallness of the original capital possessed by a Maidan ryot, which amounts to not more than the sum needed for his support for three years, combined with the limited size of his holding, precludes him from turning the land to the best account. He must sow primarily for his own consumption more than for the market. It may be allowed that by following a system, which is based on the experience of centuries, he succeeds in obtaining from the land the maximum return possible for a minimum expenditure; but of course with a heavier expenditure, which he is unable to give or afford, the yield of the land would be proportionately greater. He sows the cheapest of all grain—râggi, with a little oil-seed; while in many places the soil could yield cotton and even wheat. He is content with being the owner of a wretched breed of bullocks and buffaloes, which fare well enough in the rains, when grass is abundant, but in dry season exist on the few dry blades of grass that can be picked up in the fields. A larger breed of cattle would necessitate the growth of hay or joàri, which the ryot from the smallness of his holding is unable to undertake in sufficient quantities for their support.

It would be unfair under such circumstances to draw any comparison between his economic condition and that of an English farmer; but on the whole his position is far advanced above that of the ordinary labouring class, and is certainly not worse than that of agricultural labourers in the Midland Counties of England. We can only look to the spread of education, the force of example, and the demand for any valuable product suited to the soil to cause any material improvement in his status.

In this district his habitation consists generally of a miserable thatched hut, divided into two partitions, without light or ventilation, the one for cooking the other for sleeping, and is shared not only by his family but by all his cattle. The walls are of mud, the floors are cleanly plastered with cow-dung, but are without a vestige of any furniture. He may be, and generally is, ignorant, apathetic, and superstitious; still he is raised above need; and as he is temperate in his habits, perfectly content with his humble lot, and not overburdened with children, his wants are few. He has ordinarily food grain enough and to spare for himself and the members composing his undivided Hindu family, and by parting at the end of the season with his surplus stock of grain to dealers, or at the weekly markets, he is able with ease to meet the Government demand on his land as it falls due, also to buy the necessaries of life, such as pots, cloths, and cumblies (woollen blankets generally worn by men in Mysore), &c. He generally adds to his income by the sale of the dairy produce of his cows and buffaloes, retaining only the buttermilk for home use; and on special occasions when he may require money, he is able to raise it by the sale of a bull-calf. Some of the ryots in the open country keep also a small number of sheep and goats, which add to their means. As every individual member of the household, from the little boy who herds the cattle up to the old mother who spins, cooks, and looks after the children, is expected to contribute their quota of labour either at home or in the field, there is seldom or ever occasion for hiring extra hands, except during the harvest. The ryot makes it also a point to lay by a store of grain, sufficient toas t the year and more; and it is only when the crops fail two or three years in succession, that he and his household are pinched for food.

Whenever the value of land is enhanced by means of irrigation, or the soil is that known as black cotton, more valuable crops are raised and the circumstances of the ryots as might be expected are better. They live in better houses, they dress better, gain more, and have consequently more to spend: also such ryots as have extensive holdings are able to employ one or two agricultural servants to whom meals are given with a rupee a month as wages, and the yearly gift of a cumbly. Their houses are generally tiled in the form of a court yard (arium), and they are occasionally the owners of three or four head of good cattle. In the Malnád many of the landholders are Brahmins, most of whom have large isolated holdings, and are owners of valuable arecanut gardens. They live in large thatched houses. The condition of their sub-tenants corresponds to that of the ordinary ryot in the Maidān (plain) taluks; but many are in a very impoverished condition, owing to their crops being pledged beforehand to lenders of money, who are also traders, and are known by the term of Sutigédars.

Condition of the Labouring Class.—If the condition of the ryot of Mysore is regarded as low, that of the farm labourer is much worse. His wages, if he is engaged by the year, are almost nominal, and when hired occasionally for field work he receives As. 2 a day, and his wife one anna in the villages of the Chengiri taluk; but in the Malnad the former earn as much as As. 4 a day in the heart of the season. Such payments are almost invariably made in kind. The agricultural labourers, who belong chiefly to the lower castes, generally in addition sub-rent lands from Brahmins and others, who do not cultivate themselves. If they are farm servants hired by the year they live with the ryot and are dependent on him for their meals and clothing, and receive a small wage in money, generally from Rs. 12 to Rs. 24 in the year. In good years the ordinary sub-tenant class have enough grain for their subsistence, but as they have not ever more than a few months' stock of grain in hand and are frequently intemperate in their habits, they are the first to suffer whenever a famine takes place. When they wish to marry their children, or at times when there is no field work, they borrow from their masters and forestall future payments, owing to which circumstance they can seldom or never free themselves from obligation. Their ignorance and apathy are such that they are at the mercy of those who are better informed, and wherever there is no extraneous demand for labour their position is one almost approaching to serfdom. As was to be expected, it was by this class that the miseries of famine were chiefly experienced; but, as pointed out in paragraph 15 of my printed memorandum on the queries put in Chapter III., the famine has not been altogether an unmixed evil. There is this ray of hope for this class, that they may, though at a terrible cost, have learnt a lesson of independence; while their masters may be forced, owing to reduced numbers, to give them better terms in future. How Government may aid this class and save them from the evils of famine when famines come are questions well worthy of the consideration of the Commission. Some such system as the yearly hire of labourers at fairs, as in Scotland, suggests itself as a probable means of causing farm labourers to know their own value and of freeing them from the imposition to which they are subjected and the chains of debt by which they are bound; but so difficult is it in this country to overcome long established custom and prejudices that any premature attempt to force a change in the present method of hiring with advances would result only in failure. As temporary migration to coffee plantations has done much good in liberating them from serfdom it should be freely encouraged, especially in famine years. Loans of grain should also be given to them in famine times on the security of their masters; for it is a truth, though a painful one, that many of this class, having lingered on in a state of semi-starvation in their homes, were so sick and maciated when they joined the camps that they did so only to die.

RAJPUTANA.

Jodhpur and Jesalmir.—*Captain Barr.*—I am of opinion, both from my own observations during the limited period I have been in political charge of this district, and from information collected in the records of my office, that the ordinary economic condition of the portion of the agricultural population directly engaged in the cultivation of the land and possessing proprietary or occupancy interest in it, bears favourable comparison with the condition of a corresponding class in British territory. The description of proprietary and occupancy tenures which follows in my reply to question 10 will bear this out in some measure; I am unable to give typical instances to illustrate this, but I think the terms on which land is held, the extent of land generally held by even the smallest proprietor, the cheap rates at which labour can be employed, the simple tastes of the agricultural population of this district, all tend to show that the opportunities afforded for accumulating wealth are considerable, while the proof that advantage is taken of these opportunities may be seen in the herds of valuable cattle, horses, and camels which landed proprietors possess. The agricultural population having proprietary rights are as a rule decidedly well off, a great deal of money is spent by them in marriages, and as a matter of course the older and more respectable the family is, the larger is the outlay under this head. Surplus incomes are generally invested in gold and silver ornaments, but there are few heads of families in Marwar and Jeysulmere who have not the reputation at any rate of buried wealth.

Among the chief Thakoors and Jagirdars of the State, who may be said to head the list of landed proprietors, there are many who have contracted debts, but in most cases this is the result of reckless extravagance or of an attempt to do more than is compatible with the income of the holding, the further down the scale of landholders we look, the more we observe freedom from indebtedness; probably much of this may be attributed to the fact that debts are not easily incurred by those whose means are ostensibly small, in a native state, where the procedure of the Civil Code, which gives the Bunniah in British territory so much ease and confidence, is unknown, or at best works with difficulty and uncertainty.

AP. I. QN. 9.

CENTRAL INDIA.

ieut-Colonel Bannerman.

CENTRAL INDIA.

Bhopal.—None of the agricultural classes have any proprietary right in the land.

Baghelkhand.—The labouring class in Baghelkhand is as a rule very poor. No proprietary or occupancy right exists. Nearly all tenants are tenants-at-will, and some of the best, viz., Kols, are not even that, but merely regarded as chattels on the estate.

The principal tillers of the soil are "Kunbees," "Kachees," "Gonds," and "Kols." A Kol is as a rule fed and clothed by his master, who defrays all expenses connected with his own marriage or that of any children there may be of such, and the Kol on his part binds himself to work this out, and thus as it were contracts a voluntary slavery, and is styled "Hurwaha" or "lugoa." The other classes are merely tenants-at-will, and as a general rule it may be estimated that one may till by one plough about 12 khaurees* of land, and about one-fifth of this is kept for grazing of cattle. In general the members of his family are five and sometimes six.

A.—Cultivator himself - - -	1
His wife - - - -	1
His two sons - - -	2
His one daughter - - -	1
Total - -	5

B.—Cultivator himself - - -	1
His wife - - - -	1
His one son - - -	1
His two daughters - - -	2
Total - -	5

The two sons of A. being married to the two daughters of B., make up the assumed number of five in each family. A tenant then, with five or six members of his family, has usually two ploughs to till 24 khaurees or 48 pucka beegahs of land.

In purchasing salt, oil, and clothes, not realisable from land, he spends between 20 and 25 rupees per annum on himself and family.

Beyond a few cooking utensils, lota (brass), thali (brass), tawa (iron), he possesses no other property.

He rarely, if ever, has any grain in stock; on the contrary, he generally disposes of his expected land produce long before it is reaped at extremely favourable rates to his creditor the Mahājan, from whom necessity has compelled him to borrow money or grain. The Mahājan supplies him with grain for food, for seed, for wages which are paid in grain to field labourers, and generally with all the tenant's wants.

The house of the Kol is the smallest and meanest of all, merely a hovel from three to four feet high.

The agriculturist has rarely any surplus income for either hoarding or lending; the ornaments of his family are generally of brass, bell-metal, or pewter.

His debts are payable either in money or in grain; the latter is generally borrowed at the time of sowing (for seed), to be repaid hereafter at 15 or 25 per cent. increase per half-year, at next harvest time. Amongst the lower classes of men a debt of money is incurred on the occasion of a marriage in the family, a sum of Rs. 20 being given to the parents of the bride.

From the absence of all reliable data it is impossible to answer this question very accurately, but from inquiries made it would appear that the amount of debt in a general way may be estimated at one-half of the yearly income, and rarely ever exceeds the total profits for a whole year.

Mir Shahamat Ali.—*Rutlam.*—The soil of Malwa needs no deep ploughing. Two bullocks for a plough are considered usually enough. A holding for a plough consists generally of 30 bighas of land, three of which are irrigated and 26 non-irrigated. On irrigated the cultivator raises opium and makka crops, and on the rest food-grains and other crops. Each plough is allowed on the part of the State four or five bighas of rent-free grass land. The produce of good crops of grass on the average is about 1,000 bundles each, being one pound in weight. The average rate of rent of irrigated land is Rs. 16, and of non-irrigated Rs. 1 12 0 per bigha. A cultivator, especially Hindoo, is generally very economical. His expenses of living and clothing are not very high. He lives within his means. His savings are often spent chiefly on marriages and deaths. His house also is not very roomy; one apartment for himself and family and the other for cattle are generally enough. Very few have separate houses for themselves and cattle. The houses are generally tiled. The number of cattle is estimated at the rate of 10 head per plough, viz., two bullocks for agricultural purposes and the rest for milk. He depends for manure on his cattle. The family of a cultivator consists on the average of not less than six souls. The proportion of the agriculturists believed to be in debt may not be more than 25 per cent., and the proportion indebtedness bears to the income may be about one-third. The debt is generally due to unforeseen circumstances, causing unusual loss in cattle or the produce of crops.

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* Grain in Rewah is measured by khauris. 1 khauri = 22 koreyes, and each koreye has in it about $2\frac{3}{4}$ seers of grain (wheat). Khauri is also a measure for land, and when applied thus means the quantity of land in which one khauri wheat or 20 koreyes × $2\frac{3}{4}$ seers = 55 seers are usually sown as seed.

Note.—Wheat is the standard by which an estimate has been made.

The exact size of a koreye or of a beegah differs in some localities of Rewah, but the measure noted here is in most general use.

In a khauri of land there are two bighas, each about 100 cubits or 50 yards long by 50 broad. A bigha in Rewah then is 2,500 yards, and one khauri is consequently 5,000 yards. An English acre is 4,840 yards, and the difference between an acre and a Rewah khauri is not much.

4840 : 5000 :: 1 : 1·03.

HYDERABAD.

Moulvie Mahdi Ali.

HYDERABAD.

Economic Condition of the Agricultural Population directly engaged in the Cultivation of Land and possessing any proprietary or occupancy Interest in Land.

Excluding inamdars and cultivators holding land in alienated villages and in the Surf-e-khas districts, the Dewani portion of his Highness's dominions contains about 450,000 registered occupants. The strength of their families may be roughly estimated at 1,750,000 souls, which give the total number at 2,200,000, or a proportion of about one to four. The sub-occupants, co-sharers, &c. may be estimated at about 200,000 and the other members of their families at 800,000, making a total of 1,000,000, which bears a proportion of one to four. Thus the total number of those directly engaged in the cultivation of land, with the other members of their families, amounts to about 3,200,000.

In 1284 Fusli, the province of Telingana contained upwards of 175,000 registered occupants, who possessed 358,095 acres of wet and 1,824,776 acres of dry land, in all aggregating 2,182,871 acres. The Government assessment thereon amounted to Rs. 71,90,248, of which sum Rs. 45,68,861 were for wet and Rs, 26,21,387 for dry cultivation.

The average area of wet land per registered occupant amounted to 2·04 acres and that of dry land to 10·4, giving a total of 12·44 acres. The average assessment per registered occupant amounted to Rs. 41 0 2, of which sum Rs. 26 1 10 were for wet and Rs. 14 15 2 for dry land.

District.	Number of Cultivators.	Land held by each Cultivator in Acres.			Average Assessment per Cultivator in British Rupees.		
		Dry.	Wet.	Total.	Dry.	Wet.	Total.
1	2	3	4	5	6	7	8
					RS. A. P.	RS. A. P.	RS. A. P.
Mayduk - - -	14,482	6·16	3·32	9·48	23 3 2	36 6 5	59 9 7
Indur - - -	27,744	5·91	1·31	7·22	15 1 8	29 10 1	44 11 9
Yelgundul - - -	39,548	8·15	2·8	10·95	12 13 0	26 8 6	39 5 6
Sirpur Tandur - -	12,484	14·38	·19	14·57	9 14 5	1 2 1	11 0 6
Kummum - - -	41,707	8·64	1·68	10·32	11 15 4	22 14 2	34 13 6
Nulgoonda - - -	22,023	19·65	1·88	21·53	22 6 10	18 5 3	40 12 1
Nagur Kurnul - -	17,322	15·93	2·78	18·71	14 0 10	46 1 0	60 1 10
Total Telingana -	175,310	10·4	2·04	12·44	14 15 2	26 1 0	41 0 2

The total quantity of food grains produced in the area mentioned above may be estimated at about 1,157,909 tons, which may be valued at British Rs. 3,26,52,798. Besides food grains, the outturn of other description of crops raised may be estimated at about 26,487 tons, which may be valued at Rs. 77,16,722. Thus the total produce of the land in the Telingana district may be approximately set down at 1,244,396 tons, the value of which may be estimated at Rs. 4,03,69,520. Calculating on these data, we may set down the value of the average produce of food grain per registered occupant at Rs. 186 4 7, and that of crops other than food grains at Rs. 44 0 3, giving a total of Rs. 230 4 4.

It may therefore be said that the agriculturist pays the Government assessment (which, as shown above, amounts to Rs. 41 0 2) from the sale of the latter description of crops, while he defrays the expenses of cultivation and maintains himself and his family from the produce of his crops of food grain.

District.	Average Assessment per Cultivator in British Rupees.	Average value of Produce of each Cultivator's holding in British Rupees.	Proportion of Revenue to Value of Produce.
1	2	3	4
Mayduk - -	60	392	6·59
Indur - -	45	200	4·47
Yelgundul -	39	216	5·49
Sirpur Tandur -	11	160	14·54
Kummum -	35	173	4·94
Nulgunda -	41	259	6·41
Nagur Kurnúl -	60	326	5·43
Total average Telingana	41	230	5·6

The rate of assessment per acre of wet land amounts to Rs. 12 12 2 and for dry Rs. 1 6 11, while the total average per occupied acre comes to Rs. 3 4 7. From the foregoing figures it will be apparent that the proportion which the Government demand bears to the value of the produce is from one-fifth to one-sixth. The staple grain of Telingana country is paddy, the total produce of which, spread on the entire cultivated area, gives 2·2 tons per acre, or a money valuation of Rs. 64 13 0 per acre. Of other food grains the quantity produced per acre is 0·25 tons or seven maunds, which may be valued at Rs. 7 13 0. Excluding grain, the quantity of other crops produced per acre amounts to 0·21 tons, and the value thereof Rs. 19 14 0. The quantity of all descriptions of crops raised averages 0·57 tons per acre, while the average value per acre comes to Rs. 18 7 11. Deducting the Government demand from the amount, the cultivator has left to himself the sum of Rs. 15 3 4 per acre, from which he has to meet the cost of manuring, the interest on the capital employed, the wages of labourers, and other expenses attendant on cultivation. This may safely be set down at about one-third of the value of the total produce. Thus out of every hundred rupees' worth of crops he raises the tenant has to pay Rs. 18 as Government revenue, and has to spend besides Rs. 33 for cultivation and for the interest on the capital employed. Deducting both these items, the amount left to the cultivator is Rs. 49, which represents the net profit that he makes, or, in other words, the cultivator has left to him for his exclusive use very nearly half the produce of the soil. These figures may perhaps lead to the supposition that the ryots of the Telingana province are flourishing and prosperous. To a certain extent this may be true, but these figures have to be taken with two reservations. In the first place the foregoing calculations have been based on the figures obtained for 1284 Fasli, a year in which there happened to be a particularly good rainfall, and which consequently resulted in a "bumper" harvest. Every season cannot be reasonably expected to be as favourable for the crops. In the Telingana districts the condition of the ryot is dependent on the state of the season; a good season makes him comparatively rich, while an unfavourable one leaves him miserably poor. Whenever the rainfall is copious the area of paddy cultivation is proportionately increased, and consequently the out-turn is plentiful. The cultivator endeavours to the best of his powers to extend cultivation, and the greater the area under cultivation the greater are his prospects of gain. In 1285 the rainfall was not so heavy as what occurred in the preceding year; in 1286 it was considerably below the average, while in 1287 it was very scanty indeed. The area under paddy in these years was consequently contracted to a considerable extent. As compared with 1284 Fasli the decrease in the area of cultivation was in 1285 Fasli 34·51 per cent., in 1286 Fasli 52·83 per cent., and in 1287 Fasli 44·32 per cent. The change thus wrought in the state of the cultivator by variations in the rainfall greatly affects his prosperity, and a single year's drought totally removes the good effects of the previous year's abundance, however great the out-turn of the produce for that year may have been. The second point to be taken into consideration is the circumstance that the above calculations are based on an average of the different classes of the cultivators, including both the prosperous and the indigent. I caused careful inquiries to be instituted respecting the different classes of cultivators entered in the rent rolls. The number of cultivators classified up to date is 127,516. The number of cultivators who pay an assessment of less than Rs. 15 per annum is 49·87 per cent., or one-half; of these the number that pay less than Rs. 5 per annum amounts to 25·42 per cent. It thus becomes evident, that of the entire number of registered occupants nearly one-half of them are in indigent circumstances, earning from the soil only a bare subsistence for themselves and their families. For the Telingana province the following

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statement gives a classification of the registered occupants with respect to the amount of assessment they pay:—

No.	Cultivators.					Number of Cultivators.	Per-centage.
1	2					3	4
			RS.		RS.		
1	Paying	below	5		-	32,406	25·42
2	,,	from	5	to	9	17,408	13·65
3	,,	,,	10	,,	14	13,778	10·80
4	,,	,,	15	,,	24	15,812	12·40
5	,,	,,	25	,,	39	14,069	11·3
6	,,	,,	40	,,	59	9,818	7·70
7	,,	,,	60	,,	74	5,685	4·46
8	,,	,,	75	,,	99	5,086	3·99
9	,,	,,	100	,,	124	3,366	2·64
10	,,	,,	125	,,	149	2,407	1·89
11	,,	,,	150	,,	174	2,001	1·61
12	,,	,,	175	,,	199	1,302	1·02
13	,,	,,	200	,,	249	1,320	1·4
14	,,	,,	250	,,	299	890	·70
15	,,	,,	300	,,	349	681	·53
16	,,	,,	350	,,	399	504	·40
17	,,	,,	400	,,	499	450	·35
18	,,	,,	500	,,	599	246	·19
19	,,	,,	600	,,	699	151	·12
20	,,	,,	700	,,	799	64	·05
21	,,	,,	800	,,	899	14	·01
22	,,	,,	900	,,	999	2	—
23	,,	,,	1,000	,,	1,499	4	—
24	,,	,,	1,500	,,	1,999	1	—
25	,,	,,	2,000	,,	2,499	1	—
26	,,	,,	2,500	,,	2,999	—	—
27	,,	,,	3,000	,,	3,999	—	—
28	,,	,,	4,000	,,	4,999	—	—
29	,,	,,	5,000 and upwards			—	—
	Total				-	127,516	100

The foregoing statistics relate to the year 1284 Fasli, which, as has been mentioned elsewhere, was an exceptionally good year for crops. The out-turn in that year was considerably above the average. Then, again, the calculations given have been, based on the returns prepared by the village Patwáris, which are not to be entirely trusted for accuracy. It therefore becomes necessary to give here a tolerably correct estimate of what would be the area under cultivation, and the out-turn of produce in an ordinary year. This could only be done by taking the average of a series of years, which would include both good and bad seasons. I have consequently worked out the figures for the past eight years, and have struck an average therefrom. These years commence with 1280 and end with 1287 Fasli. It thus happens that they include exceptionally good as well as exceptionally bad seasons, and this circumstance materially adds to the correctness of the data obtained. It may once for all be stated here that the figures given below are based on an average obtained for the past eight years.

In the Telingana provinces, the area under wet cultivation may be estimated at 229,526 acres. An increase of 50 per cent. has, however, to be made on the area recorded, for this reason, that on most of these wet lands double crops are annually raised, and besides this, as has been pointed out on more than one occasion, the area recorded in the village papers is considerably below what is actually cultivated. Calculating on this datum, we get an area of about 344,000 acres of wet land. Out of this, about 14,000 acres of land may be set aside for the cultivation of sugar-cane and vegetables: this leaves 330,000 acres for the cultivation of paddy. Estimating the out-turn at 30 maunds per acre, which is very moderate indeed, we get about 353,000 tons of paddy, which may be said to be equal to 213,000 tons of rice. The money valuation of this produce, at an average rate of Rs. 30 per khandi (20 maunds), may be set down at Rs. 1,48,26,000. Estimating the produce of the area set aside for the cultivation of sugar-cane and vegetables at Rs. 40 per acre, we get Rs. 5,60,000. The entire produce of the wet lands may, therefore, be estimated at Rs. 1,53,86,000.

We have now to estimate the produce of the dry lands. The area under dry crops may be set down at 1,595,392 acres. Allowing an increase of 60 per cent. over the recorded area, as has been done for wet land, we get about 2,553,000 acres. Out of this area we have to set aside 18 per cent. of land (about 459,500 acres) for the cultivation of other than food grains, which leaves 2,093,500 acres on which food grains may be raised. The out-turn of other than food crops may be valued at Rs. 45,95,000 at Rs. 10 per acre. The produce of food grains may be estimated at 374,000 tons at 5 maunds per acre, the value of which would amount to about Rs. 1,39,56,000, at Rs. 4 per pulla (240 lbs.). The money valuation of the produce of dry lands would therefore amount to Rs. 1,85,51,000. Calculating on these data, it may be said that the entire annual produce of the lands in the Telingana province amounts to British Rupees 3,39,37,000. The average Government demand on these lands amounts to Rs. 51,23,,000. Thus the proportion which the Government demand bears to the entire produce is as 1 to 6·6. The average number of the registered occupants may be set down at 165,000. Deducting the Government demand, which on an average amounts to Rs. 31 per occupant, the sum of about Rs. 174 is left to each of them. From this sum the ryot has to meet the expenses of cultivation and to provide for the maintenance of himself and his family.

We shall now estimate the average annual out-turn of food grains and of other crops, the amount that is consumed in the Telingana province itself and the quantity that is left for exportation, &c. The total out-turn may be estimated at about 213,000 tons of rice and about 374,000 tons of other food grains, amounting in all to 587,000 tons. From this produce we have first to deduct for seed 14,700 tons of paddy (at 50 seers per acre), and 9,300 of other grain (at 5 seers per acre), making a total of 24,000 tons. The balance left is 198,000 tons of rice and 365,000 tons of other food grains, aggregating in all to 563,000. Next, we have to deduct from these figures the wastage that takes place, which may be estimated at 5 per cent. and which amounts to 31,000 tons. The total population may be roughly estimated at 2,160,000 souls,* and allowing 6 maunds of grain per head per annum, the total annual consumption may be set down at 463,000 tons. The quantity of consumption and wastage, therefore, amounts to 494,000 tons. Deducting the quantity set down for consumption and wastage from the balance left, after allowing for seed grain, we get 69,000 tons of food grains available for export, which is mainly rice, and may fairly be valued at Rs. 57,96,000. Thus the quantity available for export is between one-eighth and one-ninth of the total out-turn.

This account is for the whole province of Telingana. Following Mr. Elliott's plan, adopted by him in his report on the Mysore famine, let us now see how this account bears upon the agricultural population itself. We may estimate the total agricultural community at about 70 per cent. of the whole population, which in round numbers amount to about 1,512,000. This number includes the village artizans, labourers, and others who gain their livelihood from the land. The amount of consumption, calculated at the rate given above, may be set down at 324,000 tons, and the amount of seed grain and wastage at 55,000 tons, making a total of 379,000 tons. Deducting this quantity from the total out-turn, we have left 208,000 tons, which may be valued at Rs. 1,02,00,000. The figures represent the value of food grains alone. Of the other description of crops raised, the estimated value of the out-turn (allowing for wastage and seed at 10 per cent.) may be set down at Rs. 46,35,000. The total value of the entire out-turn may, therefore, be roughly set down at

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* It may be mentioned here that according to the returns prepared by the Patwáris, the total population amounts to 1,662,103 souls, but it has been ascertained that the recorded population is much below the actual number, an increase of 30 per cent. is therefore made on the number given.

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Rs. 1,48,35,000. From this we have to deduct the Government demand, which amounts to about Rs. 51,23,000. The profits, then, left to the agriculturists from the cultivation of the lands may be estimated at Rs. 97,12,000. Distributing this amount over the total number of registered occupants (165,000), the average amount of profit left to each amounts to Rs. 58·14. Comparing the results now obtained with those given for 1284 Fusli, we find that our estimate of the prosperous condition of the Telingana agriculturist will have to be considerably modified. The uncertainty of the seasons has a telling effect upon the condition of the cultivator. But for this uncertainty the ryot in Telingana would be a great deal better off than his brother in the Mahratta country. As it is, he lives almost from hand to mouth, and when overtaken with one or two bad seasons, he has generally nothing to fall back upon. His life is one of continued toil and vicissitude.

Mahratwari.—In the Mahratwàri province the number of registered occupants in 1,284 Fusli amounted to about 267,000. They occupied about 8,281,000 acres of land, of which 176,000 acres were wet, and 8,150,000 were dry lands. The assessment on this occupied area amounted to Rs. 87,70,000, of which sum Rs. 9,12,000 were for wet, and Rs. 78,58,000 for dry lands. The average occupied area per cultivator stood at 30·94 acres, of which ·64 acres were wet and 30·3 acres were dry lands. The average assessment per registered occupant amounted to Rs. 3 6 6 for wet, and Rs. 29 6 6 for dry land, giving a total of Rs. 32 13 0.†

The total out-turn of food grains produced in this province during the year amounted to 1,599,000 tons, and of other than food grains to 230,000 tons, making in all 1,829,000 tons. The estimated value of this outturn may be set down at Rs. 8,26,56,000, of which sum Rs. 6,08,34,000 is the value of food grains, and Rs. 2,18,22,000 of other than food grains. Calculating on these data, the average value of produce per cultivator amounts to Rs. 309 0 9, of which sum Rs. 227 7 4 is the estimated value of food grains, and Rs. 81 9 5 of other than food grains.

District.	Average Assessment per Cultivator in British Rupees.	Average Value of Produce of each Cultivator holding in British Rupees.	Proportion of Revenue to value of Produce.
Aurungabad -	49	532	11·07
Bheer - -	35	575	16·42
Purbhani -	34	367	11·10
Beeder - -	34	198	5·80
Nandair - -	35	260	7·43
Nuldroog -	35	421	12·35
Raichore -	24	162	6·75
Lingasoogoor -	23	194	8·89
Shorapur -	22	198	9·00
Gulburgah -	48	218	4·54
	33	309	9·40

It may therefore be said that less than half the value of the latter description of crop suffices to pay the Government demand upon the cultivator, and thus the cultivator saves Rs. 176 3 9 for himself, after meeting the Government demand. The average assessment per acre of wet land amounts to Rs. 5 2 10, that for dry land Rs. 0 15 6, giving the total average rate per acre at Rs. 1 0 11. The per-centage of the Government demand, as compared with the value of the total produce, amounts to 11, and the proportion which the latter bears to the former is 9·09. As compared with the Telingana province, the quantity of paddy raised in the Mahratta Country is insignificant. We cannot therefore deal separately with the average produce of paddy per acre. The average out-turn of every description of food grains in these districts amounted to ·24 tons per acre, or nearly seven maunds, the estimated value of which may be set down at Rs. 9 2 0. That of other kinds of produce amounted to ·14 tons, the value of which may be estimated at Rs. 13 9 0. The total average for every description of produce was ·24 tons, which may be valued at Rs. 10. The difference between this sum and the Government demand amounts to Rs. 8 15 1 per acre, which gives the sum that is left to the cultivator per acre. As in the case of Telingana, the ryot has to meet the cost of cultivation, and the interest on the capital employed, which may be set down at 25 per cent. of the total produce. He has also to pay 11 per cent. to meet the Government demand. Deducting these items, the net amount of profit left to him is 64 per cent. of the total amount of produce raised by him on his land.

The following statement gives the classification of about 200,000 registered occupants of the various Mahratta districts, with respect to the amount of assessment they pay :—

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† *Note.*—

District.	Number of Cultivators.	Land held by each Cultivator in Acres.			Average Assessment per Cultivator in British Rupees.		
		Dry.	Wet.	Total.	Dry.	Wet.	Total.
1	2	3	4	5	6	7	8
					RS. A. P.	RS. A. P.	RS. A. P.
Aurungabad - -	29,955	46·02	1·45	47·47	42 4 1	6 10 0	48 14 1
Beer - - -	29,942	49·28	0·72	50·00	32 6 8	2 5 9	34 12 5
Purbhani - - -	30,062	32·09	1·38	33·47	30 1 3	3 7 7	33 8 10
Beeder - - -	21,567	17·43	0·31	17·74	31 4 8	3 3 9	34 7 9
Nandair - - -	32,876	25·37	0·30	25·67	34 4 6	—	35 0 7
Nuldroog - - -	10,137	48·59	1·14	49·73	29 15 8	4 13 3	34 12 11
Raichore - - -	33,562	23·30	0·43	23·73	21 5 9	2 3 10	23 9 7
Lingasoogoor - -	32,708	26·55	0·25	26·80	21 7 7	1 10 10	23 2 5
Shorapur - - -	30,843	18·06	0·20	18·26	20 3 5	2 2 1	22 5 6
Gulburga - - -	15,790	23·74	0·74	24·48	35 14 5	12 9 7	48 8 0
Total Mahratwari -	267,442	30·30	0·64	30·94	29 6 6	3 6 6	32 13 0

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No.	Cultivators.			Number of Cultivators.	
1	2			3	4
		RS.	RS.		
1	Paying below	5	-	22,552	11·45
2	„ from	5 to	9	23,808	12·90
3	„ „	10 „	14	26,036	13·22
4	„ „	15 „	24	41,224	20·94
5	„ „	25 „	39	35,775	18·17
6	„ „	40 „	59	21,263	10·18
7	„ „	60 „	74	9,029	4·59
8	„ „	75 to	99	7,363	3·74
9	„ „	100 „	124	3,880	1·97
10	„ „	125 „	149	2,109	1·07
11	„ „	150 „	174	1,253	·64
12	„ „	175 „	199	741	·38
13	„ „	200 „	249	823	·42
14	„ „	250 „	299	427	·22
15	„ „	300 „	349	244	·12
16	„ „	350 „	399	131	·07
17	„ „	400 „	499	130	·07
18	„ „	500 „	599	54	·03
19	„ „	600 „	699	29	·01
20	„ „	700 „	799	12	—
21	„ „	800 „	899	4	—
22	„ „	900 „	999	8	—
23	„ „	1,000 „	1,499	7	—
24	„ „	1,500 „	1,999	5	—
25	„ „	2,000 „	2,499	—	—
26	„ „	2,500 „	2,999	1	—
27	„ „	3,000 „	3,999	—	—
28	„ „	4,000 „	4,999	—	—
29	„ „	5,000 and upwards		—	—
	Total			196,908	100

From the foregoing statement it will be apparent that the number of cultivators who pay an assessment of less than Rs. 15 is only about 37·57 per cent., whereas in the Telingana province, the number is as high as 49·87 per cent. This shows that the condition of the cultivators in the Mahratta districts is somewhat better than in the Telingana districts.

In the Mahratta country, the uncertainty in the seasons is not so great as in the Telingana country. With a view, however, to obtain a tolerably correct estimate of the area under cultivation, and the produce derived therefrom, it will be better to base our calculations on an average of the past eight years (1280 to 1287 Fasli), which include good and bad seasons, as has been done in the Telingana district.

Estimating on these data, it may be said that the area of wet cultivation in the Mahratta province may be set down at 156,000 acres. From this area about 25 per cent. (39,000 acres) may be allowed for raising vegetable produce, which leaves about 117,000 acres for the cultivation of food grains. Estimating the out-turn at 10 maunds per acre, we get about 42,000 tons, which may be valued at Rs. 23,46,000, at the rate of Rs. 6 per pulla (120 seers). Estimating the produce of the area set aside for the cultivation of vegetables, &c., at Rs. 40 per acre, we get about Rs. 15,60,000. The estimated value of the total produce of wet lands may therefore be set down at Rs. 39,06,000.

We shall now estimate the produce of dry lands. The area under dry crops may be set down at 7,607,000 acres. From this, about 1,450,000 acres (19 per cent.) may be allowed for the cultivation of other than food grains. This leaves 6,157,000 acres on which food grains are raised. The out-turn of other than food crops may be valued at Rs. 1,74,00,000 at Rs. 12 per acre. The out-turn of food grains may be estimated at 1,319,000 tons, at six maunds per acre, which may be valued at Rs. 6,15,73,000, at the rate of Rs. 5 per pulla. The produce of dry land may therefore be valued at Rs. 7,89,73,000.

On these data, the total out-turn of the land in the Mahratta province may be valued at Rs. 8,28,79,000. The Government demand on these lands on an average amounts to Rs. 80,50,000.

Thus the proportion that the Government demand bears to the out-turn is as 1 to 10·3. The average number of registered occupants amounts to 260,000. Deducting the Government demand, which averages Rs. 31 per occupant, a sum of about Rs. 288 is left to each, from which the ryot has to meet the expenses of cultivation, and maintain himself and his family.

We shall now estimate the annual average out-turn of food grains and other crops, the amount that is consumed, and the quantity that is left for exportation. The total out-turn of food grains may be estimated at 1,361,000 tons. From this, we have first to set aside 33,000 tons for seed grain, at six seers per acre. This leaves a balance of 1,328,000 tons of food grain. Next we have to deduct for wastage, which may be estimated at 5 per cent., and which amounts to about 66,000 tons. The total population may be roughly estimated at 3,525,000 souls, and allowing six maunds of grain per head per annum, the total consumption may be set down at 755,000 tons. The quantity of consumption and wastage therefore amounts to 821,000 tons. Deducting this quantity from the amount of grain left, after allowing for seed grain, we get 507,000 tons, valued at Rs. 2,96,60,000, which is available for export. The surplus left is $\frac{1}{27}$ of the total out-turn.

This account is for the province at large. Let us now see how it bears upon the agricultural population. We may estimate the total agricultural population at about 65 per cent. of the whole, which, in round numbers, amount to about 2,291,000 souls. The amount of consumption, calculated on the datum given above, may be set down at 491,000 tons, and the seed grain and wastage may be estimated at about 100,000 tons, which gives a total consumption of 591,000 tons. Deducting this from the total out-turn, we have left about 770,000 tons, which may be valued at Rs. 61,70,000. But this account is only for food grains. Of the other description of crop raised, the estimated value (allowing for wastage and seed at 10 per cent.) may be set down at Rs. 1,70,64,000. The total value of the out-turn may therefore be estimated at about Rs. 5,32,34,000; from this we have to deduct the Government demand, which amounts to Rs. 80,50,000. The profit then left to the agriculturist, from the cultivation of the lands, may be set down at about Rs. 4,51,84,000. Distributing this amount over the total number of registered occupants (260,000), the average amount of profit left to each may be estimated at about Rs. 173·13.

We shall now combine the results obtained for the Telingana and Mahratta provinces, and give an account for the whole dominions. The total area under cultivation may be estimated at about 10,660,000 acres, of which 10,160,000 are dry and 500,000 wet. The area devoted to food grains may be set down at 8,698,000 acres, and for other description of crops at 1,962,000 acres. The aggregate value of the total out-turn of these lands may be set down at Rs. 11,68,16,000, of which Rs. 9,27,01,000 are for food grains (2,013,371 tons) and Rs. 2,41,15,000 for crops other than food grains. The total produce of the country amounts to 1,948,000 tons. From this may be deducted the quantity of food grains necessary for consumption, and for seed and the ordinary wastage. The seed grain may be estimated at 57,000 tons, the consumption for the country at large at 1,218,000 tons, and the wastage at 97,000 tons. The surplus grain left is 576,000 tons, which may be valued at about Rs. 3,54,56,000. The value of crops other than food grains may be set down (after deducting 10 per cent. for seed and wastage) at Rs. 2,17,03,000. The entire value of the produce, after making these deductions for consumption, seed grain, and wastage, may be set down at Rs. 5,71,59,000.

Let us now consider this account, as it bears directly on the condition of the agricultural population, who raise this produce. The estimated total agricultural population may be set down at 3,803,000, which include village artisans, &c. Their consumption would amount to 815,000 tons. Deducting this quantity as well as that set aside for seed grain and wastage, the surplus left to the agriculturists may be estimated at 979,000 tons of food grains, which may be valued at Rs. 4,63,70,000. Of other than food grains the value (after deducting 10 per cent. for seed and wastage) may be set down at Rs. 2,17,03,000. The total valuation therefore would be Rs. 6,80,73,000. Deducting from this amount the Government assessment, which may be set down at Rs. 1,31,73,000, we get Rs. 5,49,00,000, which may fairly be represented as the profits of production left to the agriculturists of the entire dominions. Distributing this amount over the total number of registered occupants (425,000), the average amount of profit left to each would be Rs. 129·3.

The foregoing accounts relate chiefly to the out-turn of the land and the profits left to the cultivators. As regards their social and economic condition, it will be best to quote here from two reports, one submitted by Moulvie Nazeer Ahmed, Suddur Talukdar Northern Division, as regards the Telingana province, and the other by Furdoonji Jamshedji, Superintendent Revenue Survey, as regards the Mahratta province. Moulvie Nazeer Ahmed states—

The cultivators of Telingana are, as a class, idle, shiftless, and improvident; these characteristics being induced and aggravated in a great measure by two special causes—toddy-drinking and the influence of climate.

In this part of the country there will rarely be found a single individual, whether cultivator or labourer, who is not addicted to toddy-drinking. Among the females, though the vice is not so very general, a large number of young women of the lower classes are given to it. From about an hour and a half before sunset up to 10 p.m., the toddy shops are thronged, and a large part of the village population apparently passes away that interval of time in this foolish and injurious mode of dissipation.

The usual diet of the people is a kind of gruel called ambil, prepared by boiling a coarse ground flour of joár, lachna, sauvan, or kodru in water. When ready it is well stirred and taken with buttermilk and salt. The ambil, which is prepared from kanki into a hard paste, is called gutka, and is the food usually taken during the day. At night they eat jowàr or lachna bread and rice. A seer of this food is the usual day's allowance for either man or woman. Cultivators are much given to smoking, and their wives chew pán or betel-leaves.

Supposing that a family consists of a man, a woman, a grown-up boy, and two children, they would require three and a half seers of grain daily to support them, thus:—

Man.	Woman.	Grown-up Boy.	Each of the Children.
1 seer.	1 seer.	10 chts.	6 chts.

The amount of grain yearly consumed by a family is 32 maunds, or (if joár is the article of food) the produce of eight bighas or six acres will be sufficient to carry them through the year.

Each ryot cultivates both wet and dry lands. Out of wet cultivation the out-turn of sugar-cane goes to furnish articles of convenience and luxury, that of paddy to pay the Government revenue, cesses, and taxes, while food is supplied from the produce of dry land; and if insufficient the surplus of the produce of wet area is sold to make up the deficiency.

The average dry holding of each cultivator appears to be more than sufficient to supply him and his family with food, and should the season be favourable a moderately good surplus from the produce of wet area can be stored after paying off the Government demand. Supposing that the season is favourable and both the abi and tabi crops of rice are cultivated and yield a good out-turn, it has been found from inquiry in the Maydak district that the average value of the produce of abi paddy from one acre amounts to Rs. 55, that of tabi to Rs. 80. Deducting from the total sum the assessment, which on the average is calculated to be Rs. 13 per acre of wet land and about Rs. 40 for the expenses of cultivation, the net amount saved per acre would be Rs. 80.

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From the above statement it will appear that the cultivators might be well off so far as their income is considered; but their extravagant and dissipated habits, which have been alluded to above, prevent them from living in ease and involve them in misery. A great portion of their profit goes to purchase toddy and its necessary accompaniments, consisting of roasted meat of the coarsest kind or parched grain; the remainder is spent in the purchase of cattle, a portion being also invested in ornaments and clothing for their wives.

Those that hold the largest areas are pátels and patwáris, who never let slip any opportunity to enhance their power and enlarge their holding at the cost of other and weaker holders. In 1275 Fasli, when the batài system was done away with and payment in money was enforced, the former suroastedars and the pátels and patwáris, who from their cunning and knowledge of official routine had obtained power and mastery over the ryots, seized the occasion for their own aggrandisement, and secured for themselves exclusively many of the rights intended for the cultivators as a body.

Now, as the cultivators begin to appreciate the rights that were conferred upon them and the consequent advantages of their position, they are regaining their freedom from slavery and emerging from dependence upon the zemindars, pátels, and patwáris. The necessary consequence will be that in Telingana the proportion of cultivators holding large areas will decrease. The number of tenants-at-will has not been entered in the above table, which, if taken into account, will still more lessen the proportion of large holders.

Furdoonji Jamshedji, Superintendent of Revenue Survey in the Aurungabad district, gives the following description of the condition, incomes, domestic occupations, &c. of the four classes of agriculturists in that portion of his Highness the Nizam's dominions.

"I may therefore class the landholders of this district as follows:—

	Per cent.
Prosperous by dint of other resources	15
In tolerably easy circumstances -	60
In poor and precarious positions -	25

"I will now proceed to describe some of the household arrangements of the various classes.

"*The Kunbi's Food.*—The domestic economy of the Kunbi's household is regulated by the eldest woman of the family, who makes an excellent housewife. Butter is made from the fresh milk of the dairy, and is sent to the market for sale, while the whey and curds go to improve the family meals. With respect to the cultivators of the first and second classes, the careful housewife sees that a supply of grain, calculated to last for a full year, is stored in the house, while the vegetables are supplied from the Kunbi's own garden land. The first class of cultivators generally take three meals a day. Breakfast is served out about 9 o'clock in the morning. It consists of hot joár or bajra cakes, a dish of milk curds, and some chutney. Between 12 and 1 o'clock they take their midday meal, which generally consists of joár or bajra cakes, some dâl, and curry made with whey. The supper at night consists of bread and some one kind of home vegetables; the brinjal (egg plant) seems to be one of the favourite dishes of the Kunbis about this part of the country. This is sometimes varied with a dish of bayson, made of gram flour. The men and the children take their meals first, and are waited on by the women. They eat off brass plates, called thâlis. When their lords and masters have finished eating, the women of the family sit down to their meals, and dine out of the same brass plates, without taking the trouble to clean them. The meals are served out to the labourers by the women, each man getting a daily ration of about four breads (=2 lbs.) and some dâl or curry. This class of Kunbis are tolerably clean in their habits; both men and women wash regularly, and change their clothing every three or four days.

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In the better class of cultivators, the eldest member of the family generally stays at home, while the rest of the men proceed to the fields at dawn, performing their morning toilet in a stream, or at a well on the way. They carry with them the remains of last evening's supper, on which they breakfast at about 8 or 9 o'clock. About noon the women bring them their meals, which generally consist of fresh cakes of bajra or joár and a dish of dâl (pulse), or curry made with whey or vegetables. Sitting under a tree, the men partake of their noon-day meal. Between 8 and 9 o'clock in the evening the men take their evening meal at home, which generally consists of fresh bread, and one dish of dâl or vegetables, with some chutney; it may be mentioned here that Kunbis eat chutney with every meal. Sometimes they dine off milk and bread. 'This class of cultivators wash and change their clothing every fourth or fifth day.

In ordinary years the middle class of cultivators also eat thrice a day, but instead of always getting a dish of dâl or vegetables, they have often to be contented with the more humble fare of onions or chutney and bread. This class of cultivators are also tolerably clean in their habits.

In years of plenty the poorest class of cultivators take three meals a day, but in seasons of scarcity they have to restrict themselves to two. These meals consist of coarse bread of bajra or joár, and often of kulthi or mutt, and this is eaten with chutney or onions, and, very seldom, with a dish of herbs or vegetables.

It may be mentioned here that in talukas where kharif crops are chiefly grown, the cultivators live on bajra all the year round; but where both kharif and rabi crops are raised, they subsist on bajra from the beginning of Kartik (November) to the end of Mâgh (March). From Phalgun (March) to Ashwin (October) joár is eaten. From the end of Paoosh (February) to the beginning of Phlalgun (March) the cultivators in the rabi talukas roast and eat the tender succulent joari and wheat in the ear. From the time that the tender grain is ripening in the ear till it is harvested, the families of the poorer classes of cultivators mainly subsist on the húldas, as the tender grain is called.

The Kunbi's Dress.—It will thus be seen that the cultivators of the better and middle classes live comfortably, while the diet of the poorest class is tolerably good and sufficient in quantity. The former are well fed and well clad; the latter have sufficient to eat and are fairly clad. The ordinary dress of a cultivator of the first or second class generally consists of a heavy turban of good stuff, an angurkha or long coat, and a dhoti, of good material. He also generally wears some ornaments of silver, and occasionally of gold, about his person. The ordinary dress of a cultivator of the third class is much the same as above, excepting that it is of very coarse material, and instead of wearing a jacket or angurkha, he very often wraps a cumbli or dhoti round him. It is seldom that he wears ornaments. The women of the first and second classes are clad in sadis (long entire robe) and cholis (bodices), of tolerably good material; those of the third class wear coarser materials. They also wear silver ornaments. But the cultivators of the fourth class are miserably clad. A piece of cloth round his loins; a dirty turban, often in shreds, over his head; a coarse blanket to protect him from the wind and rain; and a tattered jacket, reserved for festive occasions, generally comprise the sole wardrobe of a cultivator of this class. A couple of coarse sadis and the same number of bodices, form the only dresses which this class of Kunbi women can boast of. But, poor as this class of cultivators are, they are contented with their lot, and in prosperous seasons, when plenty smiles over the land, a more happy and cheerful set of people can seldom be met with.

Estimated Income and Expenditure of an Agriculturist of the Middle Class.—The proportion borne by the registered occupants to the agricultural population in the assigned districts is 1 to 4. The average holding of each cultivator is about 50 acres, and the average number of bullocks about four. I will now calculate the average annual income and expenditure, in ordinary years, of a Kunbi cultivator of the middle class, with his wife and three children, aged 10, 12, and 14 respectively, and holding 50 acres of land, which he tills with two pair of bullocks. It must be presumed that he is a hard-working, thrifty farmer, and that he grows joár (rabi) on 40 acres, and bajra (kharif) on 10 acres of his holding. His income from the land, and his total expenditure, will then stand much as follows:—

Income.	Seers of Grain and Bundles of Kurbi.	Aggregate Value.	Total.
		RS. A. P.	RS. A. P.
12,000 seers of joár and bajra, estimated produce of 50 acres of land at 6 maunds (480 lbs.) per acre, and valued at 25 seers (50 lbs.) per rupee.	12,000	480 0 0	
12,000 bundles of kurbi (joár stalks), estimated at 300 bundles per acre, and valued at 8 annas per 100 bundles.	12,000	60 0 0	
5,000 bundles of surrum (bajra stalks), estimated at 500 bundles per acre, and valued at 4 annas per 100 bundles.	5,000	12 8 0	
Total out-turn in Rs. - - -	—	—	552 8 0
Deductions made.			
Seed-grain to be reserved for sowing purposes, estimated at 5 seers of joár per acre, and valued at 25 seers per rupee.	125	5 0 0	
Baluta payments, estimated at about 4½ per cent. of the produce - -	500	20 0 0	
Grain to be stored for home consumption for the year for five persons, estimated at the rate of ¾ seer (1½ lbs.) per head per diem.	1,350	54 0 0	
Wastage, estimated at the rate of 5 per cent. on the total produce - -	600	24 0 0	
Kúrbi reserved for two pairs of bullocks for four months, estimated at about 25 bundles per two pairs per diem, and valued at the rate of annas 8 per 100 bundles.	3,000	15 0 0	118 0 0
Estimated balance in hand { Grain - - -	9,425	377 0 0	—
Estimated balance in hand { Kúrbi and surrum - -	14,000	57 8 0	434 8 0

Expenditure.	Seers.	Total.	Grand Total.
Expenses of Cultivation.		RS. A. P.	RS. A. P.
Two pairs of bullocks, valued at Rs. 60, at Rs. 30 per pair, estimated to last six years.	—	10 0 0	
Oil-cake, &c., two pairs of bullocks during four months of the hot season, estimated to cost about Rs. 3 per pair per mensem.	—	12 0 0	
Cost of agricultural implements spread over the number of years they last, including cost of ropes required to be renewed annually.	—	10 0 0	
Government assessment at the average rate of Re. 1 per acre	—	50 0 0	
			82 0 0
Expenses for Food, &c., excluding Grain.			
Oil, at 2 seers per mensem	24	5 0 0	
Salt, at 2 seers per month	24	2 8 0	
Red pepper, at 2 seers per month	24	5 0 0	
Spices, at 4 annas per month	—	3 0 0	
Vegetables and pot-herbs	—	4 0 0	
Festivals	—	10 0 0	
Average annual expenditure for births, marriages, and deaths	—	25 0 0	
Extraordinary expenses, including amount of interest, &c. paid to Saucar on rare occasions.	—	50 0 0	
			104 8 0
Dress.			
2 country blankets, at Rs. 1 4 0 each	—	2 8 0	
8 dhoturs, for four male members of the family, one to be used as waist-cloth, and the other for covering the body.		5 0 0	
4 khadi (home-spun) jackets for cold weather wear		4 0 0	
4 common turbans	—	4 0 0	
4 pairs of shoes	—	2 0 0	
2 sadis and 2 bodices for the cultivator's wife	—	4 8 0	22 0 0
Total estimated expenditure, Rs.	—	—	208 8 0
Estimated balance to be saved to meet bad seasons	—	—	226 0 0
			434 8 0

Out-turn of Grain per Acre.—In justification of the foregoing, as being within the average production, it may be mentioned that given a good season, the best black soil and good tillage, the out-turn of joár sometimes amounts to as much as 14 maunds (1,120 lbs.) per acre. At the village of Nevurgaon, situate on the banks of the Godavari, in the Vaijapur taluka, one of our survey classers holds some lands. He states that this year, notwithstanding the injury caused by excess of rain, the produce of his field, on which he had raised joár, was estimated at 12 maunds per acre. Mr. Rustomji Nusserwanji, the talukdar of the district, personally conducted several experiments in the Aurungabad taluka with a view to ascertain the out-turn per acre of the different kinds of rabi grain. His experiments were made this year, when, as has been stated above, the whole of the crops were more or less damaged by excess of rain, not to mention the depredations committed by rats. With all these drawbacks, the results arrived at were not unsatisfactory. Of 25 fields of joár experimented upon, the average out-turn per bigha amounted to 5 maunds 9½ seers, or 7 maunds 1 seer per acre. In the same way, the average out-turn of 45 fields of wheat experimented upon amounted to 4 maunds 11 seers per bigha, or 5 maunds 28 seers per acre. Of 10 fields of grain examined, the average out-turn came to 5 maunds 7 seers per bigha, or 6 maunds 36 seers per acre. Taking all these circumstances into consideration, I have adopted 6 maunds per acre as a fair average for valuation of a ryot's income.

It may be observed that the above statement does not include the cost of weeding, harvesting, threshing, &c. With a family of four, a cultivator is seldom obliged to employ hired labour for these purposes, as much work of this kind is performed by mutual help. One family will help a neighbouring family in reaping their harvest, and they, in return, will assist them likewise, and so on. Where this is not the case, the boys, when their services are not required on their father's farm, go out to work as labourers, and their earnings—not included in the above estimate of income—go towards the payment of hired labour, when it is required to assist in reaping, threshing, &c.

With a holding of 50 acres, 40 of which he devotes to jorá, and 10 to bajra, the cultivator, with his family, will work pretty much in the following order of time:—

Field Operations for the Year.—In the middle of Vaisák he will prepare his land for joár with the vukkhur; this will take him eight days with two vukkhurs, at five acres per day. Another day will be occupied by himself and his family in removing the scrub and thorns from the land so prepared. In the month of Jayste he will work his previously ploughed land on which he had raised bajra last year with a magdá (harrow). He will take seven days to do this with one harrow, at about 1½ acre per day. He will now prepare 10 acres of land for bajra with the vukkhur; with two of these implements he will do this in two days, at five acres per day. In Ashad he will level his land for joár with the vukkhur: this will occupy him a week. Then, for the third time, he will level his kharif lands with the vukkhur, which will occupy him two days. He will now take two days in which to sow his kharif lands. In Shravan he will, for the third time, level his rabi lands, an operation which, with two vukkhurs, will take him eight days. He will now weed his kharif lands with a bullock hoe, which he will do in a day. In Bhadurpud and Ashwin he will enclose his fields with a hedge of thorns; this work will take him and his family about four days. He will then sow his rabi crops; this will take about 16 days. His youngest boy will now watch the ripening bajra crop for 15 days—the latter half of Ashwin. In Kartik and Margayswur one of his sons will watch the kharif crop during the first week, while he weeds his rabi crops with a bullock hoe. He now cuts his bajra, and this, with the help of his wife and two elder sons, he will accomplish in a week. He then requires about four days to bind the sheaves and to stack them. After that he will begin ploughing that portion of his field from which he has just removed the crop: this will take him about 27

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days, or nearly a month. He will now separate the bajra heads from the stalks, which, with his family assisting, will occupy about seven days. In Paoosh he will thresh and winnow his bajra crop, which, with the assistance of his wife and one of his sons, he will do in about four days. He must now crossplough his kharif lands, and this will occupy him about 26 days. Now Mágh has arrived, and the joár has to be watched. Crops growing on high land where the roots cannot readily reach the sub-soil moisture, have now to be harvested, otherwise they wither. In this way about five acres will be harvested. Before the month Phalgun the Kunbi has to reap 35 acres of his jowar crop. With his wife, two of his elder sons, and four labourers, he will execute this work in about a fortnight. With the help of his family, he must then bind the sheaves and stack them: this will take him about four days. Afterwards carting the harvest yield to the threshing-floor will occupy about 10 days. While he is so engaged his wife and children will prepare the threshing-floor, plaster and smooth it with cattle-dung, and enclose it with thorns. In Chaitur and Vaisák the family break the joár heads from the stalks, which occupies them about 20 days. The threshing can be done in about six days, and the winnowing will take as many more. Giving out balutâ (village servants' shares) will occupy the cultivator about two days.

According to the above distribution of his time, the ryot and his family will be engaged in field work for the following number of days :—

Ploughing - - - -	53 days.
Harrowing with magada - -	7 „
Levelling with vukkhur - -	28 „
Sowing - - - -	18 „
Weeding with bullock hoe - -	5 „
Enclosing fields with thorns - -	4 „
Watching the ripening crops - -	30 „
Reaping - - - -	31 days.
Carting - - - -	10 „
Separating heads of corn from the stalks	27 „
Giving out balutá - - -	2 „
Threshing and winnowing - -	16 „
Total - - - -	231 „

It will thus be seen that, out of the 365 days in the year, the field work will occupy the cultivator and his family 231 days, leaving 134 days to be otherwise occupied. Some of these must be counted for holidays, illness in the family, executing repairs at the homestead and for various other duties. Yet, allowing for all these, the Kunbi has a few weeks left, which can be profitably employed by himself or members of his family, in labouring for hire in other than his own fields, in carting or on public works, when there are any going on in his neighbourhood."

The majority of the cultivators in the Telingana province are involved in debt. Those that employ their own capital to meet the expenses of cultivation and pay the Government demand are few in number, probably not exceeding 20 per cent. The rest are all involved in debt, and of these as many as 40 per cent. have to depend upon the money lender even for the pettiest loan. They draw on him for ordinary household expenses, for the purchase of agricultural implements or bullocks, and for meeting the Government demand.

Whenever they stand in need of money, they resort to the Saucar for assistance, and in return they place at the Saucar's disposal the entire produce of their land. Some of the talukdars in the Telingana districts have instituted minute inquiries into the state of indebtedness of several cultivators in certain villages of their districts, the result of which may be tabulated as follows :—

STATEMENT A., showing the Number of Cultivators in debt and not in debt in the districts of Telingana for the year 1287 Fusli.

No.	Name of District.	Number of Talooks.	Number of Villages.	Number of Cultivators			Per-centage	
				In Debt.	Not in Debt.	Total.	In Debt.	Not in Debt.
1	Khummum - - -	3	20	1,051	520	1,571	66·90	33·10
2	Nalgunda - - - -	5	25	815	294	1,109	73·49	26·51
3	Yelgundel - - - -	4	13	798	255	1,053	75·79	24·21
4	Sirpur Tandur - - -	3	—	9,621	4,534	14,155	67·97	32·03
	Total Telingana - -	15	58	12,285	5,603	17,888	68·68	31·32

It may be mentioned here that some of the talukdars have instituted inquiries as regards the proportion the indebtedness of the agriculturists bears to their yearly income.

From the result of these inquiries it may be assumed that, generally speaking, the amount of indebtedness of most of the cultivators does not exceed their income for two years.

The number of those in debt for sums below Rs. 50 is 38·34 per cent. These cultivators are the most indigent and poverty-stricken, and may virtually be regarded as depending upon the saucar even for the bare necessities of life. They are not able to pay their revenue instalments, nor purchase bullocks and other agricultural implements unassisted. It is the saucar who must help them in this respect. They do not strive to find a market where they could sell the produce of their fields with advantage to themselves, but they must needs make over the whole to the saucar at a rate considerably less than the market value of the commodities thus made over. These transactions entail double loss upon the cultivator. In the first place the saucar charges an exorbitant rate of interest, often as much as 24 per cent. per annum, on the loans that he advances.

Secondly, he demands higher prices than what prevail in the market for all commodities that he supplies to the cultivator, and in addition to this he charges interest on these loans. Then again, he purchases from the debtor the produce of his land at considerably lower rates than what rule in the market. It may fairly be said that in this way the saucar can in the course of three years or so double the amount of his principal, and this he can easily do, without in any way attempting to cheat the cultivator, by the simple process of charging high prices for the commodities he supplies, and accepting at a low valuation all that his debtor makes over to him in repayment of his debt, add to this his high rates of interest and compound interest, and the whole secret of his success is easily understood. Should the saucar, however, be inclined to defraud the cultivator, he has every facility for doing so, and could in the short period of a year double the amount of the loan he advances. Mr. Shapurjee Jevanjee, first talukdar of the Nagur-Kurnul district, in a report submitted by him on the subject, states :—

In their transactions with the money-lender, the cultivators of this district suffer heavy losses. The usual rate of interest charged on sums advanced to well-to-do

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cultivators is Rs. 2 per cent. per mensem, and at compound interest this amounts to Rs. 2 9 or even 3 per cent. per mensem. When borrowing grain and other commodities from the saucar, the cultivator has to pay 25 per cent. more than the market value of the commodity. This loan is not repaid in coin, but is returned in kind. If the cultivator borrows paddy seed for sowing his fields during the rains, he has, in repayment, to make over at next harvest double the quantity borrowed. If the seed is required for sowing during the hot season he has to return it at 50 per cent. above the quantity lent. As the saucar generally gets his loans of grain returned to him in about six months' time it may be said that in so short a time he realises a profit of from 50 to 100 per cent. With cultivators who do not enjoy good credit the saucar is still more exorbitant. When he advances loans of grain for consumption he stipulates that the loan will be repaid in grain of a much superior description to that lent. To give an instance in point. In the Devurgarh taluka the staple grain produced is joár or ragi, the area under wheat or rice being very limited. Now when a cultivator borrows a maund of joár or ragi he has to repay this loan by a maund and a half and sometimes two maunds of paddy. In this manner he has in the course of a single year to pay considerably more than double the amount of his original debt. Should the cultivator fail to discharge his debt within one year the grain is valued at a higher rate than what prevails in the market, and interest charged on the sum. When the cultivator borrows money to pay the wages of the labourers he employs he is subjected to extra losses in addition to the interest he has to pay. For instance, when getting his fields weeded the cultivator has to pay his labourers in cash. This money he gets from the saucar. As the cultivator requires copper for distribution the saucar makes advances to him in that coin. The amount of copper that he counts as equivalent to a rupee is less by far than the current rate, and the sum of rupees arrived at according to this calculation is debited to the cultivator's account; the interest of rupees 2 per cent. per mensem is charged on this amount, and when at the commencement of the ensuing season accounts are adjusted grain is accepted in return for the money loan. This grain is again estimated at a lower valuation than the rates obtaining in the market, and settlement of the account is thus finally arrived at. Interest is charged on the amount thus arrived at from the date on which the final adjustment is made.

Instances have been found in which the amount of interest has actually doubled the amount of principal in a single year.

Moulavie Nazir Ahmed, Sader talukdar of the Northern Division, in his report on the indebtedness of the cultivating population, states :—

Taking a general view of the indebtedness of the ryot no satisfactory explanation can be given. The chief incentive to borrowing money is in some cases need, in others habit, and in the rest the ruling desire to hide their prosperity. I know a number of tenants in Telingana who cultivate 10, 15, or even 20 bighas of sugar-cane, a circumstance in itself a criterion of the cultivator's wealth. Notwithstanding this they persistently pretended to have dealings with the saucar, and whenever rent is demanded they refer the matter to the saucar and transfer their liabilities to him. Where the habit of having dealings with the money-lender has become so general and so persistent as almost to constitute one of the conditions of tenancy it is extremely difficult to understand the cause. My own experience goes to show that the number of cultivators indebted as a matter of habit is greater than that of cultivators who have to borrow out of necessity. It might be that the custom of borrowing money had its origin in poverty and want, but has now become a fixed habit of which the cultivators have not the power to divest themselves. Even when they are in a position to employ their own capital they cannot resist the temptation of inviting outside help, just as men of lazy and slothful habits are always loath to use their own limbs and get others to help them in their needs. Those that enter into transactions with money-lenders in order to hide their own opulence are not impelled to adopt this expedient from a sense of insecurity, their motive generally is an habitual aversion to hear their wealth made a subject of general remark.

It cannot be denied that the liabilities of the cultivator have increased since the days when the payment in kind system of rent prevailed, and this may be an additional cause of his indebtedness. It often happens that when Government revenue is due, the cultivator cannot conveniently dispose of his produce or there is a tendency in the rates to rise, and he is naturally inclined to hold over his stock in the hope of making larger profits. Under such circumstances he is obliged to have recourse to the money lender. But the thread of debt once woven cannot soon be unwoven again. On the other hand it can be arithmetically proved that the cultivator has gained considerably by the abolition of the batai (payment in kind) system, and there is no reason why he should always remain involved in debt. Suppose, for instance, that a tenant has a bigha of wet land under his tillage. The lowest quantity of rice that might be raised on this land is not less than a khandi and a half, the price of which at the ordinary bazaar rate is Rs. 75. Under the Batai system the Government was entitled to a moiety of the total produce and the cultivator to the other half. Under the existing payment in cash system, the average share of the Government per bigha is Rs. 13, while the balance, Rs. 62, represents the cultivator's share in the produce of his field. In other words, under the latter system the amount of the cultivator's receipts is Rs. 62 instead of Rs. 37 8 under the former. It is now clear that the idea that the existing high rate of assessment is the chief cause of the cultivator's indebtedness, and that leniency in those rates will tend to free him from the saucar's grasp, is utterly unfounded. On the other hand, it is my impression that even if the Government demand were entirely remitted, the saucar would ever be flourishing at the expense of the cultivator, who would never rise much above his present wretched position.

Although the condition of the cultivators of the Mahratta districts is much better than what prevails in the Telingana districts, and although they are not necessitated to borrow to the extent their brethren in the Telingana province are compelled to do, yet on account of their profuse expenditure, they are no better off than their brethren in Telingana, as is forcibly shown by the following quotations from Mr. Furdoonjee's report :—

As has been stated above, the Kunbi cultivator does not rightly appreciate the value of money, and the better his credit the more profuse he is in his expenditure. In prosperous seasons he does not lay by money for years of scarcity. What he gets he generally spends, and leaves the future to take care of itself. During the American war, when the Berar cultivators enriched themselves by growing cotton, a few of the Kunbis made silver ploughshares to till their fields. Most of them spent extravagant sums in the purchase of silk dresses for the women of their families. The acute saucar knows the weak points of the Kunbis, and by freely lending money to the well-to-do, he encourages them in extravagant habits, knowing that he will profit thereby. The saucar understands his own interests.

From these and other considerations, it became evident to his Highness's Government that if the cultivator were not in some measure protected by his landlord the State, he would, by rushing headlong into debt, be completely ruined. It was decided by Government that this protection could be secured by diminishing, not destroying, the credit enjoyed by the cultivators. It was at first feared that by interfering with the freedom of contract the Kunbi would not be able to raise money for the purpose of improving his land, for purchasing cattle and seed, and paying the Government demand. But, on the other hand, it was thought by diminishing the facilities for borrowing,

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the cultivators would be saved from sinking into irretrievable embarrassment, as they are prone to do when they have unlimited credit. Under well-understood regulations, the saucar would himself exercise great caution in advancing loans for marriages, feasts, and other luxuries. And yet if the Kunbi requires a loan to effect any improvements on his land, or to pay the Government demand, or for any other obviously productive or necessary purposes, it would be to the interest of the saucar to make the advance, knowing that in such cases the investment would be safe under certain restrictions. Thus, while the cultivator would find it difficult to raise a loan to squander recklessly, he would always be able to get money for useful and productive works connected with his land. Next came the question as to how the cultivator's credit was to be judiciously restricted. This was effected by the adoption of the following measures, which were embodied in circular orders, and were from time to time issued by the judicial department:—

1. No ex-parte decree was to be passed by a civil court against any debtor, until the creditor should have proved, by his books or otherwise, to the satisfaction of the court, that the bond was executed for veritable and fair consideration.

2. If a usurious rate of interest had been charged, it was to be reduced to a reasonable rate. When the amount of interest did not exceed the amount of the principal, the rate of interest entered in the bond could be adhered to, but when the amount of interest did exceed the principal, the Hindu law of Dâm dupat was to be enforced. Of however long standing the debt might be, the amount of interest given by decree was never to exceed the amount of principal.

3. When the cultivator was unable to pay at once the amount of the decree passed against him, the court could order it to be paid by reasonable instalments. If the circumstances of the case warranted interest being allowed to run on the decree, 1 per cent. per annum only was to be allowed, until the debt was liquidated.

4. When attachment was issued against a cultivator's property, his house, his agricultural implements, his cattle, and a supply of grain, enough to support him and his family till next harvest, were to be exempted from execution.

5. No judgment-debtor was to be imprisoned for debt, unless suspected of having concealed his property to evade payment.

So far as can be ascertained, these measures are judicious, and seem to work satisfactorily. We shall now give a brief account of the different terms on which a cultivator may borrow money from a money-lender.

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Where a cultivator is well off, he does not take petty loans, but borrows a lump sum from the saucar, for the payment of Government assessment, or for any other purpose, and the interest to a borrower enjoying good credit does not usually exceed one per cent. per mensem. The cultivator agrees to repay the loan at the next rabi or kharif harvest, but the agreement is generally verbal, and not written. If, at the time of harvest, the cultivator sees that the prevailing prices of grain are low, and if he thinks that there is a prospect of obtaining better prices further on, he reserves his stock of grain until such time, and asks the saucar to let the loan stand over till then. Where the cultivator's credit does not stand very high, he has generally to pay more interest, say about Rs. 1.8.0 per cent. per mensem. When one of this class resorts to a saucar, he has, in the first instance, to pass a bond, but when he becomes known to the money-lender this formality is no longer necessary. Very frequently the saucar takes payment in grain, which is sold to him at the market rate, the only difference being that, in weighing, about four or five seers (8 or 10 lbs.) is added to a pulla (240 lbs.) as kussur. Cultivators of this class do not generally borrow anything under Rs. 10; nor do they, as a rule, borrow seed grain or grain for consumption from the saucar.

If a cultivator does not enjoy good credit, the saucar lends him money on any of the four following terms:—

1. *On interest and compound interest.*—The borrower passes a bond to the saucar, say, for Rs. 100. For this he receives Rs. 98 in cash, Rs. 2 being deducted as munnoti by the saucar. The cultivator agrees to pay interest at a rate which varies from Rs. 1 8 to Rs. 2 per mensem, and to repay the advance at the next kharif or rabi harvest. If he fails to do this and defers payment till the subsequent harvest, compound interest is charged. The saucar, after getting the bond executed, does not pay down the amount in a lump sum, but lets the cultivator have it in sums sufficient to pay the Government assessment, or to buy cattle, &c. The saucar frequently pays the Government assessment direct to the patel and patwadi in Halli Sicca rupees, but he recovers the amount from the cultivator in British rupees, making a profit of one or two per cent. in the rate of exchange.

2. *Batta Mubadla.**—The saucar pays the Government assessment direct to the pátel and pádwádi in Halli Sicca rupees, and recovers from the cultivator at harvest time the same amount in British rupees. The profit he makes in the difference between the value of Halli Sicca and British rupees is not inconsiderable, because the rate of exchange varies from Rs. 14 to Rs. 22, and the period of the loan seldom or never exceeds three months. If the loan is not repaid at harvest time, interest at one or one and a half per cent. is allowed to run on the sum till it is repaid at next harvest.

Rágwáddá or *Láoni.*—The cultivator raises a loan, passing a written agreement to repay it from the produce of his fields. The saucar forms an estimate of what would be the probable ruling prices at harvest time, and, leaving a margin of 10 or 15 per cent. profit, agrees to purchase the crops at certain prices fixed between them. This contract is generally entered into four or five months before harvest time. If prices fluctuate meanwhile, either the saucar or the cultivator loses, but the former is generally the gainer by this transaction. If the cultivator fails to make over the grain at the allotted time, according to one of the terms of the contract, he has to give the saucar, in the year following, 25 or 50 per cent. over and above the quantity of grain originally agreed upon.

Suvvái.—The cultivator raises a loan, promising to repay it within a year by two instalments, the first falling due on the kharif, and the second on the rabi harvest. The bond is executed for a sum of 25 per cent. over and above the amount actually paid; this is equivalent to a rate of about two per cent. interest per mensem. Besides this, when paying the cash down, the saucar deducts two per cent. as munnoti.

One of the terms of the agreement is that, if the amount of the bond is not repaid within the times specified, interest at the rate of about one or two per cent. per mensem is to run on until such time as the loan is repaid.

It may be mentioned here that in bonds of this sort the cultivator mortgages to the saucar the produce of his fields, his cattle and house. Sometimes the fields themselves are mortgaged. It need not be stated that the property so mortgaged remains in possession of the owner, the saucar merely keeping an eye on him to see that he does not dispose of it in any way.

Besides loans in cash, some of the cultivators take loans in seed-grain, on condition that it is to be returned at harvest with 50 per cent. over and above the quantity lent; but if the loan is made at a time when the prices are high, the quantity is doubled. In transactions of this nature, written agreements are seldom entered into, the cultivator considering it a religious debt, which he is anxious to pay at the first opportunity. Hence, suits for transactions of this nature seldom or never come into civil courts.

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* Under transactions with this designation, the conditions are similar to those given above.

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When a cultivator raises a loan in grain for home consumption, he has it on condition of returning the loan at 25 or 50, and in seasons of scarcity at 100 per cent. over and above the quantity lent. A bond is generally passed for this loan. The borrower does not carry away from the saucar the whole amount of the grain at once, but receives it in such quantities as may be required. If unable to return the loan at the time agreed upon, the debtor is allowed to repay it at next harvest, with 50 per cent. over and above the total quantity due.

When a cultivator breaks down, and is unable for a period of four or five years to repay his saucar's debts, his accounts are made up, and a settlement is generally effected in this way. The cultivator enters into an agreement, by which he binds himself to till, for a certain number of years, a certain portion of his holding, and after sowing it at his own cost to make over the field to the saucar, who takes charge of it, and reaps the crops when it is ready. And so, at a little cost, the saucar gets a part of the produce of the cultivator's fields, and is thus enabled to recover what would have been a bad debt.

CENTRAL INDIA AND HYDERABAD.

Mahadeo Wasudeo Barve.

Note by Mahadeo Wasudeo Barve, one of the members of the Famine Commission, on the experience acquired by him during a tour in Central India.

From my inquiries into the condition of the ryots in four Native States, viz., Jaipur, Oojein, Indore, and Hyderabad, which may be taken fairly to represent their class, it appears that the rate of assessment is invariably higher than in British territory; that the cultivators there are as deeply involved in debt as here, if not more so; that the living and the status of the cultivator is in no way better in the Native States; and that, in short, it can by no means be said that a cultivator living under a native rule fares better than his compeer in British dominion. The glowing colours in which the fate of the British tiller of land is sometimes bemoaned, and that of the cultivator in the Native States extolled, by many, vanish before the observation of actual facts. The paucity of reliable information available on the subject has afforded those visionaries an opportunity to palm on the public, without a fear of contradiction, certain products of their imagination as undisputed facts. My own observation has led me to believe that our cultivator enjoys certain advantages over one under native rule; and that an exposure in its nakedness of condition of the latter will not fail to open the eyes of the former to the superiority of his lot.

As observed above, there is an essential difference between the systems of realising assessment obtaining in the Bombay Presidency and in the Native States. In the ryotwari system that prevails to a very great extent with us, the ryot is directly responsible to Government for the assessment due from him. There is in Native States, on the other hand, always a middleman in the farmer of the revenue of the village. So far as the pressure of the assessment on the ryot is concerned, the above-mentioned difference in the mode of the realisation of revenue is of no consequence; inasmuch as it is immaterial whether a certain demand is made by the Government direct or through the medium of another individual, so long as that demand remains unaltered. It is indeed said that the Government mode of realising revenue, viz., that of distress and sale, is stringent and not accommodating to the different mishaps to which a cultivator's calculations are frequently liable. But there appears to me no ground to expect greater leniency from a private farmer, who has only a temporary interest in the prosperity of the peasantry, than from Government, whose interests are indissolubly wound up with those of the subjects. The respite in payment that he occasionally allows to disabled ryots is deemed by those ignorant people a great boon; but they hardly know at what price that is purchased in the shape of interest paid for arrears.

The absence of anything like alienable interest in the land operates in the case of the cultivators in a Native State to make their condition much worse than that of their brethren in British India. The social status of a man varies directly as his credit; and all circumstances combine to reduce this credit to a minimum when a peasant can neither sell, mortgage, nor otherwise alienate his holding. The necessary result of such absence of credit is the difficulty of obtaining loans without stringent terms. The British ryot, on the other hand, has a tangible interest in his holding, which can serve as good security to the creditor, and which therefore helps him to borrow on comparatively moderate terms. The estate of the ryot in the land is indeed of an inferior kind, and terminable at the end of a certain period; but this interest, limited as it is, satisfies the requirements of a wary money-lender, because it is certain. The British ryot thus enjoys a privilege which is denied even to inamdars in Native States. The practice in Native States of annually farming revenue is again detrimental to the investment of capital in land on the part of the cultivators, while there is a direct incentive thereto in British territory, owing to the 30 years' tenure guaranteed by the Revenue Survey settlement, being long enough to secure to the cultivating capatilist a fair return for his outlay. It is indeed true that the assessment is not practically subject to frequent revisions in Native States; but this circumstance does not count for much in the calculations of the cultivator because the freedom from revision is not guaranteed, and cannot be depended on.

It cannot be, however, denied that the Native States hold out one advantage which the British cultivator does not enjoy. While the ryot here is made to pay his fixed assessment due on his registered holding, irrespectively of the actual cultivation, the Native States levy assessment only on the land actually cultivated. This appears to be fair, for land will never be thrown up until it ceases to yield a fair crop; and it is harsh if, owing to the diminished productive capacity of the land, or the absence of capital, a cultivator should have to leave his holding fallow, that he should have his difficulties enhanced by having to pay assessment without reaping any harvest in compensation.

A word here about the origin of the indebtedness of ryots will not be out of place. Anything like an exhaustive inquiry of this matter is impossible within the short limits of a minute of this kind. But it may be said, in brief, that I believe those who have searched for the poverty and indebtedness in the different revenue administrations have busied themselves only with the surface, and have left the interior unexplored. Experience shows that, among all the multifarious tenures obtaining in different parts of India, not one can be named which pre-eminently guards against the ryot's indebtedness. The conclusion follows that the source of that mischief does not lie in the nature of the tenures. It is my idea that the present revenue system, viewed as a whole, is fair both to Government and the ryots, and that therefore the origin of the existing evils must be sought elsewhere. It appears to me that it is the wide gulf in point of intelligence which separates the Indian cultivator from the other classes of the society that is the source of the vast disparity in their status. The same law by which the whole lower creation is made subservient to the will of man operates in the case of transactions between man and man; and it cannot be but that one more intelligent must prey on another less gifted. The absorption of the gains of the cultivators by the higher classes in this country, therefore, is no strange phenomenon, and is only an illustration of the said law. If this notion of mine is correct, it follows that the remedy to be applied must be such as raises the cultivator in the scale of intelligence, so as to enable him to utilise the powers of nature, and guard against

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the rapacity of his neighbour. This done, I am sanguine the ryot will prosper, even under the present much traduced revenue system.

Some suitable remedy for ameliorating the condition of the Indian peasantry, by means of fresh legislation or otherwise, is being devised by the statesmen of the day; and I hope their benevolent efforts will end in such a way as would afford a suitable relief to the poverty-stricken and heavily indebted land cultivating ryots, without interfering much with the class of money-lenders, who form no doubt a necessary element of the society.

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PUNJAB.

Major Wace.

CHAPTER I.—QUESTION 10.

Describe the tenures of land (proprietary and occupancy) which are most common, and as nearly as you can the area of cultivated land held by each kind of tenure. How far does the character of the tenure appear to affect the economic condition of the person holding it? Are there any conditions of tenure (such, for instance, as unrestricted freedom of transfer) which might be changed with advantage to the holder and without injury to other parties?

PUNJAB.

I append the latest statistics of land tenures in the Punjab. They are the returns on the subject furnished with the annual Revenue Report for 1875-76, and consist of two statements. The first shows the tenures held direct from Government, that is to say, the proprietary tenures, and also leases of Government lands; the second shows the tenures not held direct from Government, that is to say, tenancies of all descriptions held under proprietors.

Proprietary tenures.—Of the proprietary tenures, I extract the following description from the Punjab Administration Report for 1872-73, a description of which Mr. G. D. Barkley, one of the senior members of the Punjab civil service, is the author:—

Taking the Province as a whole, it may be estimated that between one-fifth and one-sixth of the area is the property of Government; while upwards of four fifths belongs to private owners.* The greater part of the area belonging to Government is, however, little better than a desert, and could not profitably be brought under cultivation without the aid of extensive works of irrigation. Some of the more favourabiy situated portions are preserved as forest or grazing lands, and others are held under lease from Government for purposes of cultivation; but almost the entire cultivated area of the Province is included in the lands of private owners.

These lands are held subject to the payment of land revenue to the State, or grantees holding from the State; and this revenue at present exceeds Rs. 2,20,00,000 per annum, of which more than Rs. 32,00,000 are received by assignees who had, on various grounds, claims to consideration from Government. In some cases these assignments are of the nature of the release of the revenue of lands belonging to the assignees, but they have no necessary connexion with proprietary right, and in the majority of instances the grantees are merely entitled to receive the revenue payable to Government, the amount of which is limited in the same way as if it were paid direct to Government.

The great mass of the landed property in the Punjab is held by small proprietors, who cultivate their own land in whole or in part. The chief characteristic of the tenure generally is that these proprietors are associated together in village communities, having to a greater or less extent joint interests, and, under our system of cash payments, limited so as to secure a certain profit to the proprietors, jointly responsible for the payment of the revenue assessed upon the village lands. It is almost an invariable incident of the tenure, that if any of the proprietors wishes to sell his rights, or is obliged to part with them in order to satisfy demands upon him, the other members of the same community have a preferential right to purchase them at the same price as could be obtained from outsiders.

In some cases (technically known as Zamíndári tenures) all the proprietors have an undivided interest in all the land belonging to the proprietary community,—in other words, all the land is in common; and what the proprietors themselves cultivate is held by them as tenants of the community. Their rights are regulated by their shares in the estate, both as regards the extent of the holdings they are entitled to cultivate, and as regards the distribution of profits; and if the profits from land held by non-proprietary cultivators are not sufficient to pay the revenue and other charges, the balance would ordinarily be collected from the proprietors according to the same shares.

It is, however, much more common for the proprietors to have their own separate holdings in the estate, and this separation may extend so far that there is no land susceptible of separate appropriation which is not the separate property of an individual or family. In an extreme case like this, the right of pre-emption and the joint responsibility for the revenue, in case any of the individual proprietors should fail to meet the demand upon him, are almost the only ties which bind the community together. The separation, however, generally does not go so far. Often all the cultivated land is held in separate ownership, while the pasture, ponds or tanks, &c., remain in common; in other cases the land cultivated by tenants is the common property of the community; and it frequently happens that the village contains several well-known sub-divisions, each with its own separate land, the whole of which may be held in common by the proprietors of the sub-division, or the whole may be held in severalty, or part in separate ownership and part in common.

In those communities (technically known as bhyáchára and pattidári) with partial or entire separation of proprietary title the measure of the rights and liabilities of the proprietors varies very much. It sometimes depends solely upon original acquisition and the operation of the laws of inheritance; in other cases definite shares in the land of a village or sub-division different from those which would result from the law of inheritance have been established by cus-

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[*] It is necessary to observe that the number of holders or shareholders shown in the returns is rather the number of separate holdings and shares in such holdings than of proprietors,—a person who has two distinct holdings, or shares in such holdings, being counted twice over. Thus in Kángra, with a total population of 743,882, of whom 527,086 are agriculturists, 276,245 proprietors and 34,898 tenants are returned.

tom; in other cases reference is made not to shares in the land, but to shares in a well or other source of irrigation; and there are many cases in which no specified shares are acknowledged, but the area in the separate possession of each proprietor is the sole measure of his interest. It is sometimes the case, however, that while the separate holdings do not correspond with any recognised shares, such shares will be regarded in dividing the profits of common land, or in the partition of such land; and wells are generally held according to shares, even where the title to the land depends exclusively on undisturbed possession.

In some cases the separate holdings are not permanent in their character, a custom existing by which the lands separately held can be redistributed in order to redress inequalities which have grown up since the original division. Between the Indus and the Jumna this custom is rare, and is probably almost entirely confined to river villages, which are liable to suffer greatly from diluvion, and have little common land available for proprietors whose separate holdings are swept away. Even in river villages, it is often the rule that the proprietor whose lands are swept away can claim nothing but to be relieved of his share of the liabilities of the village for revenue and other charges.

Trans-Indus, however, in the tracts of country inhabited chiefly by a Pathán population, periodical redistribution of holdings was by no means uncommon, and the same is stated to have been formerly the case in some of the villages of the Pathán iláka of Chach, Cis-Indus, in the Rawalpindi district. The remarkable feature in the redistributions Trans-Indus was that they were no mere adjustments of possession according to shares, but complete exchanges of property between one group of proprietors and another, followed by division among the proprietors of each group. Nor were they always confined to the proprietors of a single village. The tribe, and not the village, was in many cases the true proprietary unit, and the exchange was effected at intervals of 3, 5, 7, 10, 15, or 30 years between the proprietors residing in one village and those of a neighbouring village. In some cases the land only was exchanged; in others the exchange extended to the houses as well as the land. Since the country came under British rule, every opportunity has been taken to get rid of these periodical exchanges on a large scale by substituting final partitions, or adjusting the revenue demand according to the value of the lands actually held by each village; but the custom is in a few cases still acted upon amongst the proprietors of the same village, though probably no cases remain in which it would be enforced between the proprietors of distinct villages.

Throughout the greater part of the Province the organisation of the proprietors of land into village communities has existed from time immemorial, and is the work of the people themselves, and not the result of measures adopted either by our own or by previous Governments. Indeed these communities have sometimes been strong enough to resist the payment of revenue to the Government of the day, and before our rule nothing was more common than for them to decide their disputes by petty wars against each other, instead of having recourse to any superior authority to settle them. But in some localities the present communities have been constituted from motives of convenience in the application of our system of settlement. Thus in the Simla hills and in the more mountainous portions of the Kángra district the present village communities consist of numerous small hamlets, each with its own group of fields and separate lands, and which had no bond of union until they were united for administrative purposes at the time of the Land Revenue Settlement. In the Mooltan division, again, while regular village communities were frequently found in the fertile lands fringing the rivers, all trace of these disappeared where the cultivation was dependent on scattered wells beyond the influence of the river. Here the well was the true unit of property; but where the proprietors of several wells lived together for mutual protection, or their wells were sufficiently near to be conveniently included within one village boundary, the opportunity was taken to group them into village communities. The same course has been followed in some parts of the Deraját division, where small separate properties readily admitting of union were found. These arrangements were made possible by the circumstance that the village community system admits of any amount of separation of the property of the individual proprietors, and by care being taken that in the internal distribution of the revenue demand it should be duly adjusted with reference to the resources of the separate holdings. They also in general involved making over in joint ownership to the proprietors the separate holdings of waste land situate within the new boundary, in which no private property had previously existed.

In some cases the village communities, while holding and managing the land as proprietors, are bound to pay a quit-rent to superior proprietors under whom they hold. The settlement is made according to circumstances, either with the superior proprietor who collects the Government revenue as well as his quit-rent from the communities, or with the communities in actual possession of the land, who pay the land revenue to Government, and the quit-rent to the superior proprietor. In either case, the amount which the superior proprietor is entitled to collect is determined at settlement as well as the amount of the land revenue demand.

There are sometimes also proprietors holding lands within the estates of village communities, but who are not members of the communities, and are not entitled to share in the common profit, nor liable for anything more than the revenue of their own lands, the village charges ordinarily paid by proprietors, and the quit-rent, if any, payable to the proprietary body of the village. The most common examples of this class are the holders of plots at present or formerly revenue free, in which the assignees were allowed to get proprietary possession in consequence of having planted gardens or made other improvements, or because they had other claims to consideration on the part of the village community. In the Rawalpindi division also it was thought proper to record old-established tenants, who had never paid anything for the land they held but their proportion of the land revenue and village expenses, and had long paid direct to the collectors of the revenue, but were not descended from the original proprietary body, as owners of their own holdings, while not participating in the common rights and liabilities of the proprietary community. Except in the Jhelum and Rawalpindi districts, where a small quit-rent was imposed, these inferior proprietors were not required to pay anything in excess of their proportion of the Government revenue and other village charges. In Gujrát, at the time of the first regular settlement, this class held no less than 10 per cent. of the total cultivated area, and in Rawalpindi it paid nine per cent. of the revenue. In Rawalpindi the persons recorded as proprietors of their own holdings only were in some cases the representatives of the original proprietary body, jágírdárs having established proprietary rights over what were formerly the common lands of the village.

In Mooltan and Muzaffargarh, and perhaps in some other districts in the south of the Punjab, a class of proprietors distinct from the owners of the land is found under the name of Chakdárs, Sililandárs, or Kasúrkhwárs. These are the owners of wells, or occasionally of irrigation channels, constructed at their expense in land belonging to others. They possess hereditary and transferable rights, both in the well or irrigation channel and in the cultivation of the land irrigated from it, but may be bought out by the proprietor repaying the capital they have expended.

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They are generally entitled to arrange for the cultivation, paying a small fixed proportion of the produce to the proprietor, and being responsible for the Government revenue. Sometimes, however, the management of the property has been made over to the proprietor, who pays the Government revenue, and the Chakdár receives from him a fixed proportion of the produce called *hak kasúr*. Or a third party may manage the property, paying the Government revenue and the *hak kasúr*, out of which the Chakdár pays the proprietor's allowance.

In Rawalpindi also there is a small class of well-proprietors in the position of middle men, paying cash rent to the owner of the land and receiving a grain rent from the cultivator.

Thus far Mr. Barkley's description of the tenures. In proceeding to summarise the statistics of the extent of each tenure, contained in the returns appended, I shall endeavour to avoid repeating the remarks with which they are prefaced.

Unassigned Government Waste.—The area thus returned is 15,964 square miles; but there are two large errors. The portion of the hill waste of the Rawalpindi district belonging to Government is over-estimated by about 1,500 square miles; and that which belongs to Government in the Jhelum district, some 555 square miles, is wrongly returned as held by lessees, instead of being shown under this head. Allowing for these corrections, the result still is, that the right to the soil in nearly one-sixth of the Province, or about 14,900 square miles, vests solely in Government. Of this, the Hazára hill forests contribute 240 square miles; the hill wastes of the Rawalpindi district 800 (I fear this is still an over-estimate); those of the Jhelum and Shahpur hill wastes 700. The rest, some 13,000 square miles, consists of the waste Bár lands between the Sutlej and the Indus, and are situate almost entirely in the Mooltan and Deraját divisions, and in the districts of Shahpur and Gujránwála. This area in its present state is sparsely covered with stunted trees and bushes, and in ordinary years large tracts in it bear a good deal of nutritious grass during the autumn rains. Large numbers of camels and kine are consequently grazed on these waste lands. But it is in truth little better than a desert, and must remain so till irrigated by canals. For such extension these wastes offer great facilities; the soil is fertile, there are no engineering difficulties to contend with; and the Indus, Jhelum, and Chenab rivers contain an exhaustless supply of water fed from the snows of the Himalayas. In short these extensive wastes are of limited present value, but probably of great prospective value.

Grantees and lessees of the British Government.—These tenures are over-stated in the returns. For instance, in the Jhelum district, as above noticed, all the hill preserves (rakhs) seem to have been so returned, because the grazing was leased out annually; and it is probable that similar errors have occurred in other districts. But at the outside these tenures, enjoyed by 24,000 persons, cover only 1,400,000 acres, or less than 3 per cent. of the total agricultural holdings. Of these, the area held by lessees (*i.e.*, persons to whom the right of ownership has not yet been alienated) is at least three-fourths of the whole. For in making grants of waste land, it is usual to give in the first instance only a lease for a term of years (usually 20); and at the expiration of the lease, if the lessee has used the land well, it is granted to him in proprietary right or sold to him at a fair valuation. This course is followed to prevent speculative purchases of waste land by persons who lack the capital or enterprise to put them to a profitable use. Lands so leased and sold are subject to the same revenue and police responsibilities as apply to the older settled lands.

Landholders who have redeemed the revenue.—These number 595 with 51,001 acres. No such redemption is now permitted.

Zamíndári Estates.—These, it will be observed, cover but a small portion of the area of the Province. The return draws a distinction between the larger estates in which the owners are mainly rent receivers, tenants cultivating under them; and those in which the owners are also for the most part the cultivators. Omitting the latter, and also the great estate (776,960 acres) of the Khattak chief in the Kohát district, there remain of the total agricultural tenures only 1,914,034 acres, or 3½ per cent., in which the coparcenary owners of the villages are not also the principal cultivators.

Proprietary cultivating communities.—These in one or other of the several forms noted in the return (*i.e.* holding and paying revenue on an undivided tenure, or having their holdings divided) make up the great majority of the tenures. The various methods, by which the relations of the members of these communities to each other are regulated, are of little importance for the purposes of the present inquiry. Thus, where a cultivating community is said to hold its lands in common, this only means that the right of ownership is joint, and as a matter of fact the extent of land cultivated by each member is not usually very disproportionate to his proprietary share in the estate. Or, to take the much more numerous instances, in which the majority of the holdings which make up the community are separate, the economic condition of the holders depends principally on the size of the holding. Whether its relations to the rest of the community can be described in a stated share, or merely by the proportion which its area happens to bear to the whole, is an accident of the tenure which possesses an important bearing on the revenue assessment of the holding, and on its share in the village common and village management; but what really makes the holder well off, or the contrary, is the size of the holding and the relation which its profits bear to his expenses. So, neglecting all details of tenure, we can confine our attention to the total area owned by these cultivating communities. The total area is about 92 per cent. of the entire agricultural tenures.

The area per holder or shareholder is according to these returns 20 acres; but this requires explanation and modification. It includes both cultivated and waste land. Also, as stated above in a foot-note, where a man holds two distinct holdings or shares in two holdings, he has been counted twice over. It is consequently not possible to give from these returns the average area held by each agriculturist, nor to state how much thereof is cultivated. This point belongs rather to question 9; and I trust that it has been sufficiently answered therein.

Tenancies.—When I spoke above of 92 per cent. of the agricultural tenures being owned by cultivating communities, I did not mean that none of their lands are tilled by tenants, but only that the greater part were cultivated by the proprietors themselves. I now proceed to show the proportion cultivated by owners and by tenants respectively in the whole Province.

The second of the statements appended gives the area of the tenancies. This area may include a small amount of waste; but tenants usually have the use of the common waste, and their holdings consequently include little except cultivated land. The total area held by tenants is returned as 10,108,745 acres; which is 44 per cent. of the total cultivated area of the year in which the returns were prepared. But before arriving at the true area cultivated by the tenant class, some deduction has to be made from this figure. A proprietor who cultivates a portion of his neighbour's holding in the capacity of the tenant is necessarily so returned; and similarly, if he cultivates part of the common lands, he does so as a tenant. Consequently the true area of the cultivation of the tenant class, strictly so defined, is less than 44 per cent. On the whole I think it may be asserted with safety that proprietors cultivate 60 per cent., and tenants 40 per cent. of the tota larea under the plough.

The proportions in each division reckoned without any such rectification strictly on the figures of the return appended, compared with the cultivation returns of the same year, are :—

Division.	Per cent. of cultivated area cultivated by	
	Owners.	Tenants.
Delhi	66	34
Hissar	45	55
Umballa	77	23
Jullundur	69	31
Amritsar	59	41
Lahore	61	39
Rawalpindi	60	40
Mooltan *	34	66
Derajât	54	46
Peshâwar	52	48

It remains to indicate the character of the tenancies. A third of the whole tenant cultivation is held by 512,070 holdings with right of occupancy. On two thirds of this area the rents are paid in cash; on the rest the rents are fixed at a share of the produce, which varies, according to locality, from a fifth to a half. The average size of these tenancies with right of occupancy is 6½ acres; the holdings paying cash rents average nearly 6 acres, those paying rent by a share in the produce average 8 acres.

Only 1 per cent. of the whole tenancies are held on written leases.

Tenants-at-will, whose holdings number 1,096,595, cultivate of the whole tenancies a fraction less than two-thirds, viz., 6,488,313 acres. Of this area 43 per cent. pay cash rents, the holdings averaging 5 acres; 27 per cent. pay rents of half produce, the holdings averaging 6 acres; and 30 per cent. pay produce rents pitched at a smaller share than half, the holdings averaging 8½ acres.

The figures of the return give 6 acres as the average size of tenancies of all descriptions. This is not of itself equivalent to saying that a tenant on the average cultivates 6 acres. For in the return one man who holds tenancies under two separate owners would necessarily be counted twice, for he has two distinct tenancies; and, on the other hand, two brothers jointly holding one tenancy, are shown as only one holding. Setting off these two elements of error against each other, we may, I think, accept the result shown in the return, and say that on the average of all classes of tenants the holding is usually 6 acres.

The tenant with right of occupancy cannot be ousted, except by decree of the civil court passed consequent on the failure of the tenant to satisfy promptly a decree for arrears of rent. But if he himself voluntarily deserts his holding, his right of occupancy at once fails.

The tenant-at-will cannot be ousted except at the close of the agricultural year. He is in fact a tenant from year to year; and if he is not served with notice of ouster in due time before the commencement of the agricultural year, he is entitled to hold on for another year.

No useful purpose would be served by my detailing the grounds on which the occupancy rights of tenants have been awarded in the settlement and civil courts. They have not been created by us on abstract grounds of policy, but are the judicial and legislative interpretation of the privileges, which the older tenants possessed in the times immediately antecedent to our rule; an interpretation no doubt open to argument, but none the less the one arrived at by the majority of our revenue officers and judges whose duty it was to decide the matter, who had the best opportunities for doing so, and whose decision has been finally accepted by the Legislature.

The possession of such a right of occupancy has two principal results :—(1) it protects the tenant from ouster; and (2) it protects him from excessive enhancement of rent. A tenant cannot claim a reduction of rent on the ground of his occupancy; but if the owner sues to enhance his rent, the tenant's occupancy right prevents its enhancement to the level paid by tenants-at-will, according to a scale laid down in the Punjab Tenancy Act. The protection thus afforded varies from 50 to 15 per cent. of the full rent, but is only 15 per cent. in the great majority of cases.

How far does the character of the tenure appear to affect the economic condition of the person holding it?

This amounts to an inquiry how far the occupancy tenants are worse off than the owners, and the tenants-at-will than the occupancy tenants. It has to a considerable extent been answered in the replies to question 9. It is obvious and easy to reply that the size of the holdings being equal, in the long run the tenant-at-will must be worse off than the tenant with an occupancy right, and the owner better off than either. But, as a matter of fact, the differences are frequently not so great as we should *primâ facie* expect.

For instance, the appended tenure returns show that of 3,382,598 acres cultivated by occupancy tenants, 1,364,674 acres pay no higher rent than the revenue demand, or that demand plus a small cash seignorage (Malikâna—generally 2 or 3 annas per rupee of revenue).

Again, among these tenants are some of the best and most industrious of the agriculturists.

The truth is, that the character of the tenure, though clearly the most important influence, is not the only effective influence in determining the condition of the tenure holder. Besides the influences of industry and character, a very strong influence is attributable to the past history of the country under previous native governments. Revenue and rent were identical terms; the Government usually, and so far as was practicable, levied the whole rent, and dealt directly with every cultivator, ignoring proprietary privileges. These governments have passed away, but the conceptions which they created in the minds of the agriculturists are of very old standing, and change more slowly. We thus constantly find that where the tenants are a settled body of some standing, whether possessing an occupancy right or not, there is not that sharply defined difference between their welfare and that of the village proprietary which the difference of tenure would lead us to expect. No doubt the owners are rapidly realising the power which our law gives them over their tenants, especially that of enhancing rents. Besides this, our rule has greatly enhanced the power of the owner to borrow money on the security of his holding (a power which existed only to a much more limited extent under native rule); and though the tenant also can now get a larger credit than in former days, still, as compared with the owner, he stands at a great disadvantage in this respect.

Perhaps the incident which of all others gives the strongest effect to the difference between the owner's and tenant's status is the payment of rent by a share of the produce. Such produce rents are usually confined to the division of the grain, but extend occasionally even to the division of the straw. And they almost invariably reduce the tenants who pay them to an economic condition very much below that of adjacent owners with holdings of a similar size, and also distinctly below that of similar tenants paying cash rents. On fertile lands the liability to such rents is often contested by the tenants with periodically recurring bitterness. On dry lands, with uncertain crops, produce rents are not unfrequently preferred. The relative prevalence of cash and kind rents in each division is :—

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* Excluding the Jhang district, of which the figures seem to be wrong.

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Division.	Land cultivated by tenants who pay rents.		Land held by tenants on lease or on other special terms.	Total land cultivated by tenants.
	In kind by a share of the produce.	In Cash.		
Delhi - - -	79,764	6,19,841	38,218	7,37,823
Hissar - -	1,97,883	15,49,086	41,428	17,88,397
Umballa - -	1,99,527	1,88,695	5,668	3,93,890
Jullundur - -	2,55,831	3,37,656	34,255	6,27,742
Amritsar - -	4,23,749	5,77,989	19,247	10,20,985
Lahore - -	3,87,430	7,04,250	39,662	11,31,342
Rawalpindi - -	6,92,462	4,78,676	4,735	11,75,873
Mooltan* - -	8,26,201	92,034	33,589	9,51,824
Peraját - -	8,47,267	69,508	8,208	9,24,983
Peshâwar - -	2,59,397	3,26,121	1,12,818	6,98,336
Total -	4,169,511	4,943,856	337,828	9,451,195

Are there any conditions of tenure (such, for instance, as unrestricted freedom of transfer) which might be changed with advantage to the holder and without injury to other parties?

In the Punjab there are not. The freedom of transfer which the landowner possesses is materially restricted both (1) by law, and (2) by social feeling.

(1.) Testamentary dispositions of property are almost unknown; and property devolves almost universally by equal division among sons. In respect of transfers *inter vivos*, the law of pre-emption is a powerful obstacle to careless alienations. In the vast majority of transfers this right is not asserted; and a man selling under sufficient necessity and for just purposes is practically little troubled with the claims of pre-emptors. But a spendthrift, or a man acting in opposition to the feeling of the proprietary community of which he is a member, is nearly certain to find an ill-considered sale met by assertions of the right of pre-emption on the part of his village coparceners; the result being that he may succeed in parting with his land, but he will part with it not to strangers, but to other members of the same community. Occupancy tenants of the most privileged classes are permitted by the Tenancy Act (sec. 34) to sell their right of occupancy, provided local custom (sec. 2 of the Act) does not distinctly deny them this power; but they must in every case first offer their right at a fair price to the landowner. The landowner's feelings are usually strongly opposed to such sales; which are consequently few in number.

(2.) The influence of social feeling in restricting transfers is even stronger than the laws above described. It is universally esteemed utter disgrace to a man to part with his ancestral land; and, constituted as their society is, such a man has little or no chance of substituting any respectable calling for his ancestral livelihood. So that landholders throughout the Province will endure all possible straits before finally parting with their heritage.

Some further remarks on this subject will be found in the reply to question 14 of this chapter.

Statistics of Land Tenures in the Punjab.

The following is a summary of the tenures:—

Superior Tenures.	Number.	Area in acres.
Zamíndári estates held by individuals or families - - - -	1,695	26,90,994
Village communities paying in common	3,392	27,78,920
Village communities divided upon ancestral or customary shares subject to the law of inheritance - -	4,088	46,00,559
Village communities in which possession is the measure of the right in all lands - - - -	8,568	1,50,36,578
Village communities in which the lands are held partly in severalty and partly in common - - - -	16,972	2,58,61,787
Grantees or lessees of British Government - - - -	1,584	17,72,342
Landholders who have redeemed the revenue - - - -	63	51,001
Purchasers of Government waste land -	64	17,078
Government waste unassigned - -	—	1,02,16,872
Total - - -	37,659	63,026,123

Inferior Tenures.	Number.	Average area of holding.		
		A.	R.	P.
With right of occupancy paying rent in cash at different amounts (a detail of which will be found in the statement)	3,69,849	5	3	13
Ditto ditto, paying rent in kind ditto ditto - - -	1,42,221	8	1	4
Tenants holding conditionally - -	28,417	6	2	17
Tenants-at-will { Paying in cash -	5,70,352	5	4	10
Tenants-at-will { Paying in kind -	5,26,238	7	0	5
Holders of service grants cultivating the land so held - - -	40,409	1	3	2
Total - - -	1,677,486	6	0	4

The following general facts may be deduced from this statement. Of the total area of the Province, 16 per cent., and of the cultivated area, 44 per cent., is held by tenants. This fully bears out the statement which has often been made that the land is held largely by cultivating proprietors. This is a point which greatly affects all questions of revenue administration, and cannot be too prominently noticed. The number of tenants with right of occupancy amount to 30 per cent. of the total number. The majority (about 72 per cent.) of tenants with right of occupancy pay rent in cash; 52 per cent. of tenants-at-will pay cash rents. The average area of holdings of tenants who pay in cash is a little more than 5 acres; that of tenants paying rent in kind is larger.

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* The figures of the Jhang district have been omitted, as they seem to be wrong.

STATEMENT of TENURES not held direct from Government.

1.	2.	3.	4.			5.			6.			7.
Nature of Tenure.	Number of holdings.	Area of land held.	Average area of holding.			Average cash rent of each holding.			Average rent per acre.			REMARKS.
	Grand Total.											
			A.	R.	P.	RS.	A.	P.	RS.	A.	P.	
I.—*Tenants with right of occupancy.*												
Paying cash-rates. (1.) Paying only the amount of the Government revenue to the proprietors - - -	88,001	4,47,701	5	0	14	5	4	3	1	0	7	The figures in columns 2 to 6 are for 31 districts only, *i.e.*, excluding Muzaffargarh, for which no details have been given.
(2.) Paying such amount, plus a cash Málikána -	1,88,281	9,16,973	5	0	13	5	15	1	1	2	8	
(3.) Paying at stated cash rates per acre - -	38,149	4,11,206	10	3	5	5	3	4	0	7	9	
(4.) Paying lump sums (cash) for their holdings -	49,077	3,14,299	6	1	25	6	8	2	1	0	3	
Total paying rent in cash - -	3,69,849	21,57,111	5	3	13	5	13	10	1	0	1	For entire Province, including Muzaffargarh.

1.	2.	3.	4.	5.	6.	7.
Nature of Tenure.	Number of holdings.	Area of land held.	Average area of holding.	Average cash rent of each holding.	Average rent per acre.	Remarks.
	Grand Total.					
			A. R. P.	RS. A. P.	RS. A. P.	
Paying in kind. (1.) Paying by a stated share of the produce in kind. A. (a.) ½ produce and more	41,248	2,03,966	4 3 31	—	—	The figures in columns 2 to 6 are for 31 districts only, i.e., excluding Muzaffargarh, for which no details have been given.
(b.) ⅓ Produce and less than ½ produce	47,588	397,586	8 1 17	—	—	
(c.) ¼ Produce and less than ⅓ produce	25,408	2,21,825	8 2 37	—	—	
(d.) ⅕ Produce and less than ¼ produce	9,286	2,04,554	22 0 5	—	—	
(2.) Paying by a stated share of the produce, plus a further cash contribution. B. (a.) When the share of produce paid is ¼ and more	8,836	64,679	7 1 11	6 3 5	0 13 7	
(b.) When the share of produce paid is less than ¼	3,033	32,232	10 2 23	4 6 9	0 6 8	
(3.) Paying a fixed amount of grain for their holdings with or without a further cash contribution. C.	826	3,988	4 3 12	13 3 10	3 9 9	
Total paying rent in kind	1,42,221	12,25,487	8 1 4	—	—	For entire Province, including Muzaffargarh.
Grand total of tenants with right of occupancy	5,12,070	33,82,598	6 2 17	—	—	
II.—*Tenants holding conditionally.*						
(1.) For life	537	2,858	5 1 4	6 1 10	1 2 7	
(2.) For period on lease (a.) Written	14,289	1,05,834	7 1 25	9 7 10	1 4 6	
(2.) For period on lease (b.) Not written	10,141	33,795	3 1 13	7 9 8	2 4 6	
(3.) Subject to village service and payment of rent	3,450	15,757	4 2 11	6 13 5	1 7 9	
III.—*Tenants-at will.* (a.) Paying in cash	5,70,352	27,88,089	4 3 22	5 4 10	1 1 4	
(b.) Paying in kind ½ produce and more	2,95,273	17,45,436	5 3 26	—	—	
(b.) Paying in kind Less than ½ produce	2,30,965	19,54,788	8 1 34	—	—	
IV.—*Holders of service grants cultivating the lands held* (i.e., *parties enjoying freeholds from proprietors being excused all revenue*).						
(1.) Sankalap or Dharmarth	22,332	50,107	2 0 39	—	—	
(2.) Conditional on service	18,077	29,483	1 2 21	—	—	
Total	16,77,486	101,08,745	6 0 4	—	—	

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinc. and Oud.

Mr. Ellic and Mr. B

The oldest form of proprietary tenure found among the village communities of the North-Western Provinces is the bhaiachara. The essence of this tenure, is, that the division of the land is based not according to ancestral right, by which each member or cluster of members owns a share resting on his relation to the common forefather and his position on the genealogical tree, but it is based on actual facts, each member of the brotherhood taking that portion which at the moment of crystallisation he actually holds; so that the stronger members got a larger, the weaker a smaller share. Where the division is minute, as it generally is (since such communities have always been on the land for many generations), a certain number of representatives called lambardars are elected, who collect from each sharer his quota of the land-revenue and pay it into Government. All are mutually responsible for the revenue; that is, if any sharer falls into arrears, the rest are liable to have it collected from them, and must take their own measures to recover from the defaulter.

All other tenures are more recent in their origin, the mode of division indicating that the proprietary body have not yet forgotten their common ancestor or lost their family feeling, but divide their estate according to ancestral shares. There are two forms of such division—complete and incomplete, or, as they are called, perfect and imperfect.

3. When such a body of proprietors cannot any longer agree to act together or to accept the common headship of one representative, they generally proceed

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to a division. In former times they usually divided the cultivated land only, leaving the fallow waste in common; and this is called an "imperfect partition." Each shareholder, or each set of shareholders who still agree to hold in common, pays a share of the revenue proportionate to the share of cultivated land that has fallen to him or it. By degrees the fallow land is broken up and cultivated, and the rent received from it is generally taken in the first place to pay the revenue, the remainder only being distributed among the owners of the separate shares.

4. This, however, implies some remnant of communal action; and when party-feuds are bitter, the shareholders cannot agree as to the management of the undivided land, and the collection of rents from those who cultivate it. In this case they proceed to a "perfect partition," the whole of the village lands being divided, whether cultivated or waste. Each share or patti bears its portion of the revenue; and if the owner or owners of one patti fall into arrears, the other pattis are not responsible, and their owners can only be called on to pay up if they agree to take over the management of the defaulting patti for a term of years.

5. As all communal life leads to quarrels and feuds (especially in peaceful times, when the village community no longer have to maintain their existence by the sword), the undivided village tenure is necessarily the most recent in its origin, and is ordinarily not more than three or four generations old. This is known as the "zamindari tenure," in which there is no division of land, profits being divided among the owners according to the arithmetical fraction ($\frac{1}{2}$, $\frac{1}{4}$, &c.) of the share which each holds, after payment of revenue and common expenses. Ordinarily speaking, one man acts as the representative of the proprietors, collects all the rents from the tenants, pays the Government revenue and other charges, and distributes the profits. If the proprietors themselves cultivate land, a light nominal rental is written against it; and when the accounts are made up, it is assumed that each has already received that sum towards his share of profits.

6. These tenures, as will be easily understood, melt imperceptibly into each other. In bhaiachara estates there was sometimes at the time of partition a portion of land left undivided, so that they might be classified as perfect and imperfect bhaiacharas. In such cases the division of the common land is fraught with many difficulties; and if new land is taken into cultivation there is sometimes a new arrangement of rates, leaving possession of the new land to the proprietor who has taken it instead of new distribution of land. In all kinds of divided tenures the owners of any share or patti may hold it among themselves undivided on the zamindari tenure, or may subdivide it completely or incompletely. It would be easy to conceive that every kind of tenure might co-exist in a large bhaiachara village.

7. As time goes on, the shareholders multiply and crowd on the original soil; feuds and quarrels spring up; new purchasers get in who have no interest in common with the old owners; common land is broken up and rented; and from all these causes a process of differentiation goes on, and partition is called for. This takes the form of—

(1.) Conversion of zamindari estates into imperfect pattidari estates;

(2.) Conversion of zamindari or imperfect pattidari into pattidari estates; or

(3.) Complete separation of all rights and interests, and conversion of the share or patti into a new and distinct estate.

8. This right of partition carries with it undoubted advantages. It enables a shareholder to escape from the frauds and oppressions of an astute or overbearing lambardar, or the encroachments of a money-lending purchaser. It limits his liabilities, and defines his rights. It is in harmony with the general process of individualisation which is going on, and which civilisation and law encourage. But that very process entails social and administrative evils of the gravest character. The unlimited right of partition encourages the multiplication of numbers which may tread too closely on the productive power of the soil. There is no stimulus to instigate the younger son to go out into the world, to adopt a profession, or to emigrate, if he can always claim to divide off his inherited share in the paternal acres and to enjoy them as his sole property. From an administrative point of view, the multiplication of numerous properties from which the revenue has to be collected separately is a great evil. If they are distinct estates, the task of collection falls on the Government establishment, which must be strengthened. If they are only distinct shares in an estate, the task falls on the lambardar; and Mr. Alexander (Moradabad) has pointed out how great an evil this intricate subdivision is; and he mentions that in some parts to appoint a man lambardar is considered equal to fining him Rs. 200. He proposes, as a remedy, to limit the number of zamindars, *i.e.*, that Government should refuse to recognise any subdivision of land, or of rights in land, below a certain minimum area. It is likely that, as the Deputy Commissioner of Kheri notices, the smaller the proprietor becomes, the harder he presses on his tenants. There is no doubt that the cost of collection to Government will become seriously greater as the process continues; and such has been found to be the case in some of the permanently settled tracts where subdivisions have been excessive.

9. It is an evil from an agricultural point of view that the land of each holder should be broken up and separated (for, even if the proprietor does not cultivate himself he has to give his tenants broken holdings), and it would be a great advantage to distribute cultivators' holdings as far as possible by blocks. It has been advocated that the rules under the partition law should make it understood that inability to divide an estate into compact blocks will bar partition, and that the power which is given by the law to the highest revenue court of appeal to disallow partition on this ground should be more strictly exercised by the lower courts except in special cases. The number of partition cases before the revenue courts in 1876–77 was between 4,000 and 5,000.

10. Other proprietary tenures may now be noticed, which arise from difference of circumstances as to the payment of revenue.

Revenue-free estates are held by possessors of valid grants made under native rule. A large number of grants were assessed some years ago as invalid, and the estimated revenue of those still free of all revenue demand is Rs. 1,08,727.

Nazarána estates, in which a fixed sum (nazarána) is paid "representing the tribute which revenue-free "holders paid to the amils (Muhammadan revenue-"collectors or governors) to secure their favour" (Moradabad reply). These estates are found only in the Meerut and Rohilkhand divisions.

Quit-rent holdings are few, having an estimated revenue of Rs. 7,697 only.

Ubári estates are those estates in the Jhansi division of which a fixed portion of the revenue is remitted.

Fee simple estates are those in which grantees have been allowed, under a law now obsolete, to buy up or redeem land-revenue; they occur in the Sub-Himalayan and hill tracts.

The following is an abstract of the remitted revenue (*i.e.*, of the revenue estimated as lost to Government):—

—	Nazarána holdings.	Quit-rent holdings.	Ubárí tenures.	Lands wholly revenue-free.	Fee-simple estates.
	Rs.	Rs.	Rs.	Rs.	Rs.
1876–77 - -	25,623	7,270	5,524	1,08,727	1,147
1875–76 - -	26,719	3,646	5,149	1,07,465	1,141

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11. The above tenures belong to the North-Western Provinces. Circumstances are somewhat different in Oudh, because a different evolution has followed a different history. At the beginning of the century the conditions of the two Provinces were similar. There were in the North-Western Provinces (when ceded) two classes of large revenue-payers both known as "talukdars." Of these, one class were the heads or the representative men of clans or large brotherhoods; the others were court-favourites, revenue-collectors or contractors. They were treated in various ways by the British Government. Generally they were allowed malikána (or seigniorage); occasionally they were vested with full proprietary rights, to the exclusion of all subordinate rights; and sometimes were not acknowledged at all, but ousted as usurpers, the subordinate proprietors being alone recognised. The result at the present date is, that in a few cases only the existence of a malikána payment (limited to 10 per cent. on the old revenue) still gives evidence of the former existence of a dual right.

12. The talukdars of Oudh have, on the contrary, been allowed to retain their superior rights, although in 1800 they probably were on the same level as the large revenue-payers of the North-Western Provinces. But before Oudh came into our hands the claims of the sub-proprietors were better understood, so that the superior revenue-payers did not in Oudh, as they did so often in the North-Western Provinces, obscure the position and take the place of the inferior holders, while at the same time their own claim to a superior right was admitted.

13. The manner in which the Oudh talukdars have acquired their position, and the nature of the subordinate rights which the law has recognised as existing under the talukdar, are described in the following remarks of Mr. Woodburn, Deputy Commissioner of Faizabad:—

"The history of these estates (talukdars' estates), their origin and growth, is a familiar debating ground in Indian politics. The district illustrates every variety of them. In one of its talukas the landlord is even now a merely nominal chieftain, *primus inter pares*, the nucleus to an agglomeration of clansmen. In another he is the hereditary head of an ancient *sept*, supreme in his family dignity, and almost unfettered in his proprietary privileges. A third estate has slowly been accumulated by the successive members of a careful and respectable family. The largest of all was founded by a brilliant adventurer, and built up with the aid of official influence by a far-seeing and unscrupulous successor.

"In the lands of every talukdar there exist, in more or less degree, sub-proprietary rights. They are of various kinds, both in origin and in value.

"The strongest and most valuable of these is known as a 'sub-settlement.' The lands of a sub-settlement are ordinarily one or more entire villages, the property, as a rule, of one of those peasant communities which elsewhere hold an independent position. The owners, whether for the protection of their lands or to secure a lighter revenue demand, sometimes at their own instance, sometimes under pressure, had included their estate in the revenue engagement of a powerful neighbour; or their lands had always recognised the feudal superiority of the chief of the clan, or grants to cadets of the leading-house had been divided to the growing generations in continuous subordination to the parent race. The feudal relationship we found at annexation has been maintained. The owners are under-proprietors of their estates. They pay to the baron the revenue assessed upon their lands, with a per-centage, which varies according to the amount of their former rents from 10 to 50 per cent. More than a third of the taluka villages are held on this tenure.

"In taluka villages which have been purchased from the old proprietors, or in which their rights have been depressed to a lower tenure than sub-settlement, the former owners have received almost everywhere provision of some sort in the assignment of an under-proprietary right in the fields of their cultivating occupancy, rent free or at a privileged rate of rent. The latest returns report the number of sír-holders to be 3,290, with an occupancy of 21,878 acres, at a decreed rent of Rs. 47,585.

"In some instances the privileges and perquisites of the original owner had been so pressed out, that in the maintenance of the *status quo* which was the principle of the Oudh settlement there was found for them no place for favour. Cases of this sort were to a certain extent arranged for by the provisions of section 5 of the Rent Act. Owners of the soil who held their lands in independent tenure down to 30 years before the annexation are confirmed in the occupancy of the fields they held at the close of native rule at a rent 12½ per cent. below the rents ruling for similar lands. Two thousand five hundred and six persons have received decrees for occupancy rights in an area of 7,032 acres.

"These may be called 'hereditary rights.' There are, besides these, acquired subordinate rights of great extent common to both talukas and the estates of zamindari communities.

"Grants of birt and shankalap (rent-free grants) are everywhere common. These are sometimes purely religious grants. They are more commonly secular assignments thinly veiled in a religious form. It is almost invariably the form in which a landlord gives a plot of waste to a small capitalist to bring under cultivation. The district is peculiar for the remarkable number of small hamlets which break the stretches of plain between the regular villages, each hamlet a fresh centre of cultivation and verdure. They are almost always the settlements of shankalapdars. Sometimes they paid money for the allotment; but they invariably got a formal conveyance, fixing the rent to be paid on the cleared lands.

"In the south of this district there is another common sub-tenure known as biswi. It is a mortgage of cultivated lands at a rent which is as much lower than the full rent as the yearly interest of the mortgage money. In many cases the transactions are of very old date, and the relationship has become confirmed under the rules of limitation.

"Under these conveyances nearly 6,000 tenures have been settled by decree. They cover an area of 39,547 acres.

"The holders of these acquired subordinate tenures seem to inherit the prudence under which they were farmed. They are rarely in difficulties. The owners of the ancestral sub-tenures, on the other hand, are very commonly embarrassed, sometimes very gravely so. In the case of sub-settlements this is not surprising. They are held and managed by the same classes as in independent villages. In the latter the owners are not supposed by Government to be able to pay more than half the net assets. In the sub-settlements they have often to pay three-fourths. It is only a rigidly methodical and punctual system that can save them from difficulty. This they have but seldom had the courage to give themselves. It is only within the last two years that the law has furnished any effectual means of ensuring the punctual payment of sub-settlement rents; and the earlier period in which they were left almost to their own wishes has loaded them with a rent debt which must be in unfortunately numerous cases ruinous.

"It would have been happier probably for all parties if these sub-settlement holders, owners of the soil, but, in fact, in the course of events now middlemen, had been reduced at once to the position of sír-holders, giving them exceptionally favourable terms of occupancy. It would have broken certainly the principle of the *status quo*; but it would have been a step quite familiar to the rough practices of the nawabi, and, taken at the first, would have been quietly accepted. It is the point to which they are now gradually drifting."

14. The agricultural statistics of the Province are not yet in a sufficiently forward condition to return the total number of proprietors in each class, but the following statement shows approximately how the cul-

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tivated area is distributed between the different classes. It is an abridgement of Statement No. I., which will be found at the end of this reply :—

Holders of Superior Tenures.	N. W. P.	Oudh.
Talukdárs	3 per cent.	59 per cent.
Undivided communities	39 „	16 „
Divided „	51 „	20 „
Revenue free estates	4 „	2 „
Others	3 „	3 „

15. Land subject to different cultivating rights may be classed as follows :—

(1) land held as sír :
(2) land held by zamindars as tenants other than sír :
(3) land held by tenants at fixed rates :
(4) land held by privileged tenants :
(5) land held by occupancy tenants :
(6) land held by tenants at will :
(7) rent free land held—
  (*a*) as a grant by the landlord ;
  (*b*) in lieu of wages.

(1.) *Sír* is defined in Act XIX. of 1873 to be the land recognised by village custom as the special holding of a co-sharer, and corresponds (to compare small things with large) to the home farm of an English proprietor. In this land no occupancy rights can accrue to any one to whom it is let for purposes of cultivation. It is generally valued in the village accounts at a very low rate of nominal rent ; and, on account of the privileges thus attaching to it, a shareholder in a divided village is not allowed to include more land in his sír than a certain quantity fixed in former years.

(2.) *Land held by zemindars as tenants other than Sír.*—There is nothing to prevent any proprietor from cultivating any area in excess of his sír that may be available, but he must then take it on the same terms as any other tenant. Resident proprietary families of which the members are numerous occasionally are found to cultivate a good deal of land in this way as ordinary tenants, and, until the late revision of settlement occurred, there was not a little difficulty in separating it from sír land proper.

(3.) *Tenants at fixed rates.*—In the permanently settled districts cultivators who have held their land continuously for more than 20 years are presumed, in default of proof to the contrary, to have held it since the permanent settlement was made (in 1790), and to be entitled to the same benefits as were then conferred on the landlords ; *i.e.*, they have a right to sit at fixed rates, and cannot have their rental enhanced. This is the only cultivating tenure which is legally transferable.

(4.) *Privileged tenants* are "ex-proprietors," who, after their proprietary rights have been sold, are, under the present law, allowed to hold what was their sír land on favourable terms, viz., at a rent of 25 per cent. less than ordinary tenants.

(5.) *Occupancy tenants*—those who have cultivated continuously for twelve years.

They cannot be ousted, except by order of a court on account of non-payment of rent, and cannot have their rents enhanced, except by decree of a rent court ; and then only up to the prevailing rate paid by similar land in the neighbourhood.

(6.) *Tenants at will* can be ousted at the end of the agricultural year, and can be rack-rented at the pleasure of the landlord.

(7.) "*Holders of grants*" are either relatives of the proprietors or religious members of the community who have been given a plot of land, free of rent, by the proprietors. They include the *shankalapdars* or *birtdars* of Oudh mentioned by Mr. Woodburn.

Those who hold "in lieu of wages" are village servants, *e.g.*, watchmen, sweepers, &c.

16. The agricultural statistics are not yet compiled with sufficient fullness to be able to state the number of the different classes of cultivators, or the area they hold, nor does any record at all exist regarding the tenants at fixed rates in the permanently settled districts, the privileged tenants, nor the holders of rent free land ; the numbers of these classes however are small. The following information has been supplied to show approximately in the North-Western Provinces the per-centage of cultivated area held by the three main classes of cultivators. The statement from which it is abridged (No. II.) will be found at the end of this reply.

Cultivated by the zamindars	26·5 per cent.
„ tenants with occupancy and other rights	41·7 „
„ tenants at will	31·8 „

17. The following further statistics have been collected from settlement reports to show as far as dossible the numbers of persons belonging to these classes, and the area they cultivate :—

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	Districts.	Cultivating Proprietors.		Tenants with Occupancy Right.		Tenants-at-will.		Total.		Average Area.
		Number.	Area.	Number.	Area.	Number.	Area.	Number.	Area.	
			Acres.		Acres.		Acres.		Acres.	Acres.
North-Western Provinces.	Saharanpur	37,762	357,789	20,526	147,694	36,320	212,349	94,608	717,832	7·5
	Bulandshahr	14,206	166,541	22,717	220,662	56,596	412,542	93,519	799,745	8·5
	Alighar	15,193	204,938	28,380	258,749	43,752	433,485	87,325	897,172	10·2
	Bijnor	20,916	102,517	36,851	278,331	46,030	209,958	104,797	590,806	5·8
	Budaon	—	—	102,226	501,212	64,064	190,871	166,290	692,083	4·1
	Bareilly	10,968	66,514	132,103	610,759	79,155	190,441	222,230	867,714	3·8
	Shahjehanpur	5,078	26,391	33,168	70,647	18,704	30,501	51,872	101,148	2·9
	Mainpuri	15,602	88,582	80,641	369,693	28,535	129,821	124,778	605,121	4·2
	Farukhabad	20,603	107,335	102,703	417,600	47,239	127,456	170,595	545,056	3·8
	Etah	13,531	99,184	71,459	379,651	32,859	129,732	117,849	619,329	4·9
	Cawnpore	—	—	—	—	—	—	199,857	799,428	4·
	Fatehpur	13,745	66,563	85,225	352,605	42,869	113,135	141,839	532,303	3·7
	Jhansi	—	—	3,697	31,736	2,699	13,495	6,396	45,231	7·
	Azamgarh	64,057	324,209	109,860	357,742	64,955	85,110	238,872	767,061	3·2
		231,661	1,610,563	830,554	3,997,082	563,777	2,278,896	1,847,928	8,580,727	4·64

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Oudh.

	Districts.	Numbers.			Total No.	Area held by			Total Area.	Average Area per Head.
		Proprietors.	Resident Tenants.	Non-resident Tenants.		Proprietors.	Resident Tenants.	Non-resident Tenants.		
						Acres.	Acres.	Acres.	Acres.	Acres.
Oudh.	Lucknow - - -	16,452	87,801	26,627	130,880	58,995	347,566	73,713	480,274	3·67
	Bara Banki - - -	6,751	99,496	35,783	142,030	89,296	375,286	69,711	534,293	3·76
	Rai Bareilly - - -	10,530	87,631	23,624	121,785	65,387	290,037	72,930	428,354	3·51
	Sultanpur - - -	19,734	171,072	57,305	248,111	83,935	333,236	88,349	505,520	2·04
	Pertabgarh - - -	12,658	105,206	28,391	146,255	76,760	342,243	75,050	492,053	3·36
	Gonda - - -	16,320	136,176	36,644	189,140	36,878	284,198	56,089	377,165	1·99
	Baraich - - -	—	173,674	45,363	219,037	26,023	658,420	151,754	836,197	3·81
	Sitapur - - -	—	104,760	53,705	158,465	—	585,562	193,434	778,996	4·91
	Total -	82,445	965,816	307,442	1,355,703	437,274	3,214,548	781,030	4,432,852	3·27

18. Hardly any suggestions have been made by the district officers as to any alterations than can be made with advantage in the conditions of tenures, and very few officers have paid any attention at all to this subject. Mr. Alexander's proposal for restricting subdivisions has already been referred to. Mr. Dale (Mirzapur) points out that, when a transferable cultivating tenure is sold to a money-lender or other non-agriculturist, the purchaser becomes a middleman who pockets and lives on the difference between the protected rent he pays and the rack-rent he extorts, and he desires to make such sales impossible by declaring a cultivating tenure forfeited if the holder does not cultivate. A proposal has been made by Messrs. Elliott and Buck (but it is disapproved by the Board of Revenue) to curtail the frequency of enhancement suits, and to enable tenants at will to secure the rights of a higher class of cultivator by purchase. All these topics will be more fully discussed under the head of Chapter III. of the Report.

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NORTH-WESTERN PROVINCES AND OUDH.

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I.—STATEMENT showing PER-CENTAGES of LAND and REVENUE under each kind of Proprietary Tenure.

—	Per-centage of Cultivated Area under each Tenure.							Per-centage of Revenue under each Tenure.							Remarks.
			Pattidari.							Pattidari.					
	Taluqdari.	Zamindari.	Perfect.	Imperfect.	Bhaiáchára.	Revenue-free.	Others.	Taluqdari.	Zamindari.	Perfect.	Imperfect.	Bháiáchára.	Revenue-free.	Others.	
Dehra Dún - -	—	50	—	23	11	6	10	—	41	—	27	15	—	17	
Saháranpur - -	—	17	1	48	31	3	—	—	16	1	48	35	—	—	
Muzaffarnagar - -	—	25	18	18	37	2	—	—	25	19	19	37	—	—	
Meerut - - -	—	6	7	44	42	1	—	—	6	6	46	42	—	—	
Bulandshahr - -	—	69	3	7	20	1	—	—	69	3	8	19	1	—	
Aligarh - - -	20	28	17	29	5	1	—	18	26	19	30	5	2	—	
Bijnor - - -	—	67	9	10	10	4	—	—	69	9	10	12	—	—	
Moradabad - - -	—	59	4	21	—	16	—	—	72	4	24	—	—	—	
Bareilly - - -	—	57	23	13	3	3	1	—	59	24	14	3	—	—	
Budaun - - -	—	38	41	16	2	3	—	—	40	42	17	1	—	—	
Sháhjahánpur - -	8	51	23	18	—	—	—	8	55	21	16	—	—	—	
Muttra - - -	3	27	3	—	59	8	—	4	29	3	—	64	—	—	
Agra - - -	1	18	5	72	—	4	—	—	40	4	56	—	—	—	
Mainpuri - - -	—	36	62	—	2	—	—	—	40	58	—	2	—	—	
Farukhabad - -	—	53	15	25	2	5	—	—	52	15	25	2	6	—	
Etáwah - - -	—	63	9	18	7	3	—	—	66	10	20	4	—	—	
Etah - - -	15	32	24	20	8	1	—	18	35	23	23	1	—	—	
Jalaun - - -	—	30	—	55	7	1	7	—	31	—	60	7	1	1	
Jhánsi - - -	13	14	1	63	4	5	—	6	18	1	71	4	—	—	
Lalitpur - - -	—	49	4	10	—	23	14	—	61	3	26	—	—	10	
Cawnpore - - -	—	51	23	24	2	—	—	—	49	24	26	1	—	—	
Fatehpur - - -	—	66	12	19	3	—	—	—	64	13	20	3	—	—	
Bánda - - -	—	50	2	42	2	4	—	—	48	2	46	2	2	—	
Allahabad - - -	12	50	8	24	4	1	1	5	55	9	26	5	—	—	
Hamírpur - - -	—	37	3	39	20	1	—	—	35	4	39	22	—	—	
Jaunpur - - -	2	46	10	41	1	—	—	—	49	10	40	1	—	—	
Azamgarh - - -	—	21	6	63	9	—	1	—	22	4	64	9	—	1	
Mirzapur - - -	21	12	1	32	—	34	—	31	27	2	40	—	—	—	
Benares - - -	—	40	19	39	—	2	—	—	45	18	37	—	—	—	
Gorakhpur - - -	No return received.							No return received.							
Basti - - -	—	22	3	63	1	3	8	—	24	3	68	1	1	3	
Ghàzipur - - -	—	46	11	35	7	1	—	—	46	13	35	6	—	—	
Kumaun - - -	Statistics incomplete.							1	—	—	—	92	7		
Garhwál - - -	Statistics incomplete.							Statistics incomplete.							
Tarái - - -	—	22	9	3	—	2	64	—	37	18	6	—	—	39	
Lucknow - - -	Details of cultivated area not furnished.							29	25	2	32	1	10	1	
Barabanki - - -	50	11	1	35	1	2	—	52	10	2	34	1	1	—	
Unao - - -	29	33	4	28	3	1	2	27	31	4	31	4	1	2	
Fyzabad - - -	75	10	—	11	1	2	1	74	10	—	11	1	2	2	
Bahraich - - -	91	4	—	3	—	2	—	90	4	—	4	—	2	—	
Gonda - - -	73	12	2	5	—	3	5	75	13	2	6	—	4	—	
Sitapur - - -	51	15	2	12	6	1	13	51	14	2	11	7	1	14	
Hardoi - - -	24	29	8	35	1	3	—	26	27	9	34	1	3	—	
Kheri - - -	67	23	1	1	—	3	5	67	23	1	3	4	1	1	
Rai Bareli - - -	62	12	1	17	—	4	4	62	12	1	16	—	5	4	
Sultanpur - - -	52	11	1	23	8	2	3	51	11	1	24	8	1	4	
Partabgarh - - -	79	13	1	3	2	1	1	36	60	1	1	1	—	1	

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STATEMENT II.

STATEMENT showing PER-CENTAGES of AREA under different Holdings in the Districts of the North-Western Provinces to the Cultivated Area.

—	Of Land occupied by Zamindars.	Of Land occupied by Occupancy Tenants.	Of Land occupied by others.	Remarks.
Dehra Dún -	30	70	—	
Sahâranpur -	49	21	30	
Muzaffarnagar -	39	27	34	
Meerut - -	49	24	27	
Bulandshahr -	21	28	51	
Aligarh - -	23	29	48	
Bijnor - -	14	36	50	
Moradabad -	10	58	32	
Bareilly - -	7	52	41	
Budaun - -	17	60	23	
Sháhjahánpur -	14	61	25	
Muttra - -	33	33	34	
Agra - -	22	52	26	
Mainpuri - -	18	61	21	
Farukhabad -	19	61	20	
Etáwah - -	13	59	28	
Etah - - -	17	61	22	
Jalaun - -	34	18	48	
Jhánsi - -	42	28	30	
Lalitpur - -	19	32	49	
Cawnpore - -	16	62	22	
Fatehpur - -	12	55	33	
Bânda - -	27	34	39	
Allahabad - -	6	67	27	
Hamírpur - -	33	32	35	
Jaunpur - -	17	37	46	
Azamgarh - -	42	34	24	
Mirzapur - -	—	—	—	Return not received.
Benares - -	22	28	50	
Gorakhpur - -	25	29	46	
Basti - -	27	23	50	
Gházipur - -	32	52	16	
Kumaun - -	69	19	12	
Garhwal - -	74	20	6	
Tarái - -	9	54	37	

BENGAL.

BENGAL.

Mr. Toynbe

Land Tenures, &c.—The following account of the land tenures of Bengal, taken almost *verbatim* from a memorandum by the late Mr. McNeile, C.S., will explain generally the state of affairs existing in the Lower Provinces.

The decennial settlement of Bengal and Behar, commenced in 1789, and completed in 1790–91, was declared to be permanent in 1793. The zamindars, with whom the settlement was originally made, were powerful chiefs, holding vast tracts of country, of which by the settlement they were constituted *proprietors*. Owing to the unbending character of the Government demand, which could not be enforced against tenants with equal rigour, these large estates were speedily broken up and subdivided into a large number of smaller ones, the purchasers of which succeeded to the proprietary rights of the original holders. The only condition of continuance of this proprietary right was the punctual payment of the Government demand. The zamindars, as the proprietors are called, seeing how the Government had escaped all the labour and risks attendant on detailed mofussil management, were not slow to follow the example set them. They disposed of their estates in a similar manner by creating permanent under-tenures called *patni* tenures, extensive tracts being leased out in this way on long terms. By the year 1819 these alienations had become so common that they were formally recognised by Regulation VIII. of that year. The practice of creating these under-tenures was steadily continued until the present day, when but a small proportion of the whole permanently settled area of Bengal remains in the direct possession of the zamindars. In making these alienations, or in letting their lands out in farm, the zamindars exact a bonus and obtain far better terms than the Government originally got from them.

The process of sub-infeudation described above has not terminated with the patnidars and ijaradars. Darpatnis and darijaras, and even further subordinate tenures, have been created in great numbers (*vide* annexure). These tenures and under-tenures often comprise defined tracts of land; but the more common practice has been to sublet certain aliquot shares of the whole superior tenure, the consequence of which is, that the tenants in any particular village of an estate now very usually pay their rents to two, or many more than two, different masters so many annas in the rupee to each. Some few similar under-tenures which existed before the permanent settlement were then recognised as such, or have been since confirmed by lapse of time. In addition to these tenures, the country is dotted over with small plots of land held revenue-free, the large majority of them having been granted by former Governments, or zemindars under those Governments, as religious endowments—grants which have since been recognised and confirmed by the English Government.

Of the ryots who actually till the soil there are three classes—

1.—Those having permanent holdings at fixed rents;
2.—Those having rights of occupancy but liable to have their rents raised on certain grounds laid down by law; and
3.—Tenants-at-will.

The tendency of the proprietors and tenure-holders of Bengal has been to reduce as far as possible the area held by ryots of the first two classes, and to convert them into those of the third. In Eastern Bengal the process of sub-infeudation has created a large class of petty cultivating proprietors, and as a rule the ryots of those parts are well able to hold their own. But in Northern Bengal, and especially in Behar, the system of creating under-tenures, and giving out estates to farm on short lease, has had the effect of reducing the peasantry to a state of hand-to-mouth existence, which has long called for legislative interference.

The economic effect of the various processes above described has been this. As stated in the answer to question 13, the road cess returns show that the gross rental of the land in Lower Bengal is now nearly four times as large as the Government revenue due from it. Since the time of the permanent settlement of Bengal, two concurrent processes have been at work to produce their joint effect, viz., the extension of cultivation and the fall in the value of money. As to the latter, this value being a relative quantity, it is difficult to gauge its fluctuations with accuracy, but, on the whole, there can be no doubt that less than 50 per cent. will not adequately represent the amount of the fall during the last eighty years. It is an obvious reflection that this has halved the value of the Government revenue assessed on the Lower Provinces in 1793. Who has

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BENGAL

Mr. Toynbee.

reaped the benefit of this increase? The zamindars have obtained a portion of the profits, perhaps a considerable portion; but they have excluded themselves by the creation of permanent under-tenures from a large share of the prospective augmentation of the rental of their estates. The same observation applies to under-tenants who have adopted the same course. The ryots, however, though there can be no doubt that their position has on the whole greatly improved and that the money value of the wages of labour and the profits of small proprietors have largely increased, are yet still, as a rule, in the position of living from hand to mouth, and have no accumulated resources to fall back upon in times of scarcity and distress, though in the eastern districts they are year by year becoming comparatively independent of money-lenders. The traders and money-lenders are beyond all question the classes who have secured the mass of the increased wealth of the country. It is not too much to say that they have amassed such riches and such influence as to become the most powerful class in the community. They very often invest their gains in landed property, and thus supply new blood to the old landholding classes. But while they bring fresh energy and intelligence to bear upon the development of the resources of their properties, they are harder on their tenants than the original proprietors were. The best available figured information bearing on the Commission's 10th question appears to be contained in the printed statistics compiled for each district from the records of the Road Cess Department. Even in these the area covered by each tenure, or class of tenures, is not given. It is probably in most cases quite unknown to the zamindar himself; so great has been the extent of the sub-infeudation and sub-division of tenures in some parts of Bengal during the last century. Without a cadastral survey, accompanied by such detailed field to field statistical inquiries as form a part of settlement proceedings, it is impossible to give for Bengal, with any degree of statistical accuracy, the information asked for in question 10. As some index and test of the comparative wealth and position of the various tenure-holders and ryots, the figures in the statement on the following page have been prepared from the road cess papers above referred to. It will be observed how large a proportion of the ryotee holdings pay a rental of between Rs. 5 and Rs. 20 per annum, and how much larger a proportion pay less than Rs. 5. The figures given under the head of ryotee holdings will not accurately represent the number of individual ryots, for many of them hold land in more than one estate, under more than one landlord, and would under such circumstances have been counted more than once in the returns. The returns which the Road Cess Law required only provided that the number of ryots and the amount of rent paid by each should be shown in the returns due from each estate. There was no obligation on the landholder to state the area or the number of plots held by each ryot. Still, for comparative purposes, the figures are valuable and show in a remarkable manner how the increased pressure of the population on the soil tends more and more to create petty holdings and break up large ones. Columns 16 to 19 show the extent to which sub-infeudation has been carried on in Bengal.

It may be safely assumed that those ryots who pay less than Rs. 5 per annum for their holding, supplement their resources by service or by labour of some kind, whether at home, or in the fields, or on public and private works. They would in time of famine or scarcity be the next, after the purely landless classes, to resort to such works as were opened by the State. Ryots paying between Rs. 5 and Rs. 20 would, as a rule, be more or less dependent on State help according to the circumstances of the season, and the severity of the failure of crop. All those paying over Rs. 20 may be fairly said to be able to take care of themselves, but they, as will be seen from the figures, form but a very small part of the whole.

The only change in conditions of tenure, which it would apparently be feasible and advantageous to make at present, is that which has been recently proposed, viz., to make the occupancy ryots' tenure generally transferable *by law* to other cultivating ryots. As a matter of fact, the transferable character of these tenures has been affirmed by local custom in very many districts simply as an occupancy tenure, and the landlord has the same remedies against the new tenant, and the same powers of enhancement, that he had against the old. It is believed that the general recognition by law of the transferability of the occupancy tenure would have no injurious effect upon the position of the zamindars, while it would certainly tend to improve the condition of their tenantry, and to give them a greater interest in the improvement of their lands. Nothing could be better calculated to improve the system of cultivation, and the value of an estate, than permanency and security of the ryots' tenure. If after securing by law transferability of tenure to the occupancy ryot (a right which he already possesses by custom in many parts of the country) provision were made in the law to prevent him from converting himself into a mere middleman, or transferring to non-cultivating holders, and for strictly regulating the character of the sub-letting to which an occupancy ryot must limit himself, it would seem that a great improvement would be effected in the law of tenant right in Bengal, such as would tend to raise the value of property and increase the landlord's security for his rent.

STATEMENT showing the ECONOMIC CONDITION of BENGAL with regard to Estates, Tenures, and Holdings of different Values.

DIVISION.	DISTRICT.	NUMBER OF ESTATES IN THE DISTRICT WITH AN ANNUAL RENTAL OF			NUMBER OF RYOTEE HOLDINGS IN THE DISTRICT PAYING AS RENTAL						NUMBER OF TENURES IN THE DISTRICT WITH AN ANNUAL RENTAL OF			OF THE TENURES IN COLUMN 14.					REMARKS.
														Held direct of the estate.	Sub-infeudated to Degree.				
		Rs. 100 and over.	Less than Rs. 100.	Total.	More than Rs. 100.	Rs. 50 to Rs. 100.	Rs. 20 to Rs. 50.	Rs. 5 to Rs. 20.	Less than Rs. 5.	Total.	Rs. 100 and over.	Less than Rs. 100.	Total.		First.	Second.	Third.	Fourth.	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
BURDWAN	Burdwan	1,733	4,770	6,503	1,663	12,827	70,124	212,011	318,501	615,126	23,189	48,781	71,970	10,100	47,577	13,275	939	79	
	Bankoora	446	424	870	61	731	4,614	20,807	47,272	73,485	962	5,689	6,651	5,113	1,189	297	50	2	
	Beerbhoom	498	166	664	385	2,670	22,849	42,840	76,772	145'516	1,114	7,869	8,983	3,292	4,721	941	29	—	
	Midnapore†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Hooghly with Howrah	916	2,657	3,573	701	5,312	26,909	97,344	208,717	338,983	1,338	13,705	15,043	8,094	6,559	375	15	—	
PRESIDENCY	24-Pergunnahs	1,327	876	2,203	559	9,301	42,009	123,607	207,690	383,166	4,463	11,338	15,801	11,228	4,119	357	54	29	
	Nuddea	1,010	2,251	3,261	881	4,859	23,094	79,272	215,398	323,504	2,658	5,509	8,167	4,678	2,539	875	75	—	
	Jessore	1,035	1,990	3,025	66	3,986	22,671	105,190	191,124	323,037	5,542	44,239	49,781	23,926	18,729	5,691	1,296	125	
	Moorshedabad	1,560	1,643	3,203	681	3,347	23,689	112,126	285,917	425,760	2,122	13,148	15,270	6,762	5,659	2,318	521	10	
RAJSHAHYE	Dinagepore†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Rajshahye	1,265	506	1,771	99	2,666	25,459	144,849	433,893	606,966	2,651	7,517	10,168	6,521	2,962	557	125	3	
	Rnugpore†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Bogra	453	246	699	66	995	11,323	53,256	69,629	135,269	1,003	3,273	4,276	3,990	193	93	—	—	
	Pubna	749	514	1,263	31	600	7,201	48,252	110,587	166,671	697	3,140	3,837	3,041	725	69	2	—	
	Darjeeling†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Julpigoree	1,013	3,186	4,199	266	1,429	5,085	12,941	8,348	28,069	3,082	5,985	9,067	6,060	2,513	486	8	—	
DACCA	Dacca	1,840	6,008	7,848	156	839	7,596	75,187	245,853	329,131	1,027	16,360	17,387	14,076	3,309	2	—	—	
	Furreedpore	569	1,777	2,286	33	176	2,255	21,104	120,107	143,675	369	11,042	11,411	10,440	966	5	—	—	
	Backergunge	1,497	1,958	3,455	385	4,363	29,948	118,753	508,617	662,066	16,701	245,186	261,887	69,770	180,578	46,611	11,712	2,463	
	Mymensingh	2,869	3,418	6,287	200	1,743	23,922	174,079	353,763	553,707	5,286	22,542	27,828	20,136	6,647	985	60	—	
	Tipperah	1,075	1,209	2,284	143	2,147	28,308	148,675	367,689	546,962	2,733	9,399	12,132	12,132	—	—	—	—	
CHITTAGONG	Chittagong†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Noakholly†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Chittagong Hill Tracts*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
PATNA	Patna	6,174	2,877	9,051	7,146	17,775	46,985	85,808	123,294	281,008	2,604	7,940	10,544	10,372	168	4	—	—	
	Gya†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Shahabad†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Durbhunga	5,467	2,339	7,806	1,841	8,278	47,450	173,733	254,189	485,491	2,740	8,112	10,852	9,531	1,232	89	—	—	
	Mozufferpore	5,267	3,633	8,900	1,297	5,860	36,335	145,098	254,110	442,700	2,365	9,626	11,991	9,369	1,143	34	4	—	
	Sarun	4,390	801	5,191	745	5,775	40,858	158,570	269,347	475,295	2,603	9,524	12,127	12,115	12	—	—	—	
	Chumparun	802	179	981	512	1,965	21,156	115,002	109,229	247,864	1,761	7,786	9,547	8,991	556	—	—	—	
BHAGULPORE	Monghyr	2,352	3,186	5,538	1,311	5,988	25,107	89,929	193,986	316,321	1,991	5,293	7,284	5,201	1,959	113	11	—	
	Bhagulpore	1,771	2,869	4,640	2,728	9,114	40,976	113,902	166,864	333,584	1,634	3,166	4,800	4,800	—	—	—	—	
	Purneah	924	899	1,823	2,461	4,675	15,422	60,259	198,664	281,481	2,526	9,091	11,617	10,171	1,380	63	3	—	
	Maldah	822	368	690	281	569	4,685	42,807	157,175	205,517	357	1,960	2,317	2,017	263	36	1	—	
	Sonthal Pergunnahs*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
ORISSA	Cuttack	1,789	11,233	13,022	302	861	9,894	71,513	274,025	356,595	1,770	10,447	12,217	11,158	999	60	—	—	
	Pooree	391	5,146	5,537	13	169	3,100	28,374	149,466	181,122	1,580	33,872	35,452	28,179	7,041	232	—	—	
	Balasore	1,397	10,723	12,120	—	99	2,646	30,963	108,109	141,817	265	16,315	16,580	16,250	330	—	—	—	
CHOTA NAGPORE	Hazareebagh	260	266	526	35	332	4,738	36,945	42,671	84,721	3,930	13,832	17,762	7,802	7,928	1,964	248	17	
	Lohardugga†	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Singbhoom*	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
	Manbhoom	61	5	66	193	666	5,945	46,213	65,258	118,275	2,853	8,708	11,561	7,383	3,730	433	15	—	
	Total	51,162	78,123	129,285	25,241	119,617	682,353	2,789,409	6,136,264	9,752,884	103,916	620,394	724,310	362,698	265,726	75,965	15,168	2,728	

Note.—In the road cess valuations, estates with a revenue not exceeding Rs. 100 and revenue-free estates admitted of summary valuation. When thus valued, if the proprietors accepted the valuation no returns were received, and consequently no detailed information of the kind given above was obtained. Hence on a rough average the figures given in columns 6 to 11 only embrace about three-fourths of the entire area under cultivation. Similarly the figures in columns 12 to 19 will not be perfectly complete, though there is no reason to doubt the correctness of the proportions.

* The Road Cess Act is not in force in these districts.

† The returns from these districts have not yet been received.

In the following districts sub-infeudation goes beyond the fourth degree, viz., 24-Pergunnah and Jessore have each 14 sub-tenures of the fifth degree, Backergunge 572 of the fifth, 176 of the sixth, and eleven of the seventh. Hazareebagh has three of the fifth degree.

AP. I. QN.10.

CENTRAL
ROVINCES.

r. Nicholls.

CENTRAL PROVINCES.

I.—The proprietary tenures are those of—

A.	Zamindars, Jagirdars,	Chieftains holding large, hilly, compact tracts.	
B.	Talukdars, Superior proprietors,	More or less pensioners on the land.	
C.	Malguzars, Inferior proprietors, Patels, Gouteahs,	Owners and headmen of villages.	
D.	Maafidars, Mokassadars,	Assignees of full Government revenue in mahals.	General term used in the Nagpur Province.
E.	Ubaridars, Maktadars,	Assignees of part of the Government revenue in mahals, or quit-rent proprietors.	Saugor and Nerbudda term. Nagpur Province term.

F. Malik Makbuzas, proprietors of a division of a mauzah, or proprietors of their own holdings.

The maafidar of a field is the proprietor of his holding, and also the assignee of the Government revenue assessed on such field.

II.—The occupancy tenures are—

G. Absolute occupancy ryots.
H. Occupancy ryots.
J. Tenants-at-will.
K. Service holders.

The malguzari or proprietary rights were conferred on single individuals, or on the headman of undivided families, on the sharers of a divided family, or in pattidari estates, on representatives of the shareholding families, in the few Byachara villages, on the proprietary community.

The Zemindars and Jaghirdars are chieftains, holding large compact estates, formerly granted as feudal holdings. The revenue demand to be paid by them is fixed for their whole estate at easy rates, and not with reference to the amount of rent derived by them from each individual village. These are found mostly in the Chhattisgarh division, Chanda, Bhandara, and Balaghat, and the Jaghirdars in Chhindwara.

In some of their villages inferior proprietary rights have been bestowed on relatives of the chief or on headmen of villages on account of special grants, long possession, or for having brought the village into cultivation. Such inferior proprietors are in most respects equal to malguzars, paying their fixed quotas to the Zamindar instead of paying to Government.

Talukdars are in a position of less dignity, and their lands are often scattered; each individual village has been settled, and the total amount which they pay has been calculated on the assessments of separate villages.

In these estates the Talukdar is for some villages the sole proprietor, or malguzar, and is only called by the higher title out of compliment; but in many villages inferior proprietary rights have been conferred on the headmen, as in the case of Zamindari estates. The sub-settlement provides what amount is to be paid to the Talukdar, and this varies from 10 to 50 per cent. above the fixed Government demand payable by the Talukdar into the treasury. In a few cases the settlement was made direct with the sub-proprietors, who pay into the treasury the Government demand plus malikana, which last is paid from the treasury to the Talukdar, or, as he is sometimes called in Chhattisgarh, the Tahutdar. The superior proprietors are, for single villages, the persons with whom the settlement has been made, there being an inferior proprietor who pays to the superior proprietor the village jama plus malikana, the former of which the superior proprietor pays into the Government treasury. The superior proprietor is, in fact, for a single village, in the same position as the Talukdar stands towards his villages in which inferior rights have also been acknowledged.

This superior proprietor is a pensioner on the land, the inferior proprietor being the village manager.

The superior proprietor of a Talukdari estate is something more than this, as Government has the security of his whole taluk or estate for the payment of the jama of each village.

Inferior proprietors have been described above. Generally they are in the same position as malguzars, but instead of paying to Government, where the settlement is not made direct with them, they pay to the Zamindar, Talukdar, or other superior proprietor the Government revenue demand, plus malikana. In other words, they divide the profits with the superior proprietor, but the amount the superior thus receives has been fixed at a certain sum under the terms of the settlement.

The introduction of the malguzari settlement, borrowed from the north-west, commenced in 1854. Proprietary rights were conferred on such person or persons or cultivating communities as appeared from ancestral right or long possession, or both, to possess the best claims. Such properties were made subject to all the incidents of real property, and could be sold for arrears of rent, for debt, at the pleasure of the owner, or could be mortgaged, or given away, or, under due safeguards, partitioned.

"Malik Makbuzas" are the owners of holdings less than a full village, that is, divisions of a village; they represent the Junadars, the Kadimi Kastkars, the Watandars, the descendants of ousted Patels of the original founders of the village and the holders of resumed rent-free plots, and the like. For convenience the revenue is not collected from them direct, but they pay their assessed revenue quota to the Malguzar of the village in which the holdings lie, plus cesses (if the holding be assessed at more than 10 rupees) plus Haq-ul-tahsil, that is, a per-centage enjoyed by the Malguzar for his trouble of collection and his responsibility to Government for this item of revenue. This is also supposed to cover the Malik Makbuza's share of the common village expenses.

A Maafidar is simply an assignee of the Government revenue, whether it be of a whole village or of a share of a village or of a rent-free plot, such as is above described as the property of a Malik Makbuza. He is often the proprietor of the whole village.

Properly speaking a Mukassadar (a Nagpur term) is a Maafidar.

A Maktadar (a Nagpur term corresponding to the Ubaridar of the Saugor and Nerbudda territory) pays a quit-rent. That is, he pays something less to Government than what is the full Malguzari assessment on the village, or in the case of Ubaridars, sometimes on the group of villages belonging to one owner. It is a privileged tenure. Generally on the death of an incumbent the estate is brought on to full rates or to a higher rate. He is the assignee of a portion of the Government revenue demand. These tenures have an historical and political basis.

In Nimar and Chanda the Patel is the substitute of the Malguzar, being the village headman, but his rights in respect of raising rents, in the management of the waste lands, and of obtaining partition are restricted for the term of settlement.

In Sambalpur, the Gaonteah is similar to the Malguzar; he retains for his trouble and responsibility, free of revenue, his bograh or sir lands, worth about one-fifth of what would be the full revenue on the full village cultivation. He annually distributes the fields and their respective revenue burdens among the ryots, if the custom of the village requires it, otherwise he merely re-apportions the revenue demands. If he cultivates more land than his bograh, he has to assess his excess equally with the lands of the cultivators. His position is clearly shown in the following extracts from Lieutenant Birch's report in 1857, which form the basis of our present summary settlement:—

"The Gaonteahs or headmen of villages are a description of middlemen holding 814½ villages and 445 hamlets. Their duty is to attend to the improvement and cultivation of the village lands, to apportion the Government demand, and to collect the rents from the ryots. They are required to furnish information of all crimes committed within their boundaries, and to assist the police not only in apprehending but in conveying offenders to the Sadar station. They are also expected to apprehend all criminals discovered in the act of committing crime, and are bound to keep up all established roads, bunds, &c. They are permitted to hold a certain amount of land in each village, called bhogra land, rent-free, and they are held liable in person and property for the Government demand from the villages included in their leases.

"The lands held rent-free by the Gaonteahs are considered sufficient remuneration for the performance of the duties imposed on them. They are not permitted to exact from their ryots any more than the Government demand, nor can they oust any of them without showing good cause for doing so; but they are left to make their own arrangements with the ryots, and generally their settlements are made after either of the two following modes, either the lands are divided amongst the ryots in such a manner as that each portion shall contain the same relative proportion of the different qualities of land as is contained in the whole village, or else the ryoti lands are divided into equal parts; each part is assessed at the same amount; each ryot takes one, two, or more portions, according to his means, and the Gaonteah risks any loss that may befall him from the inferior lands not being taken. The former method is more general, but the latter principally prevails in pergannas Chunderpore and Booteeah, where the surface of the country is usually level and the difference in the quantity of land very slight."

The occupancy tenures are: first, those of absolute occupancy ryots. These are the ryots, (1) whose previous possession carried with it something of an hereditary character; (2) who had expended such capital on their fields as to give them some special title; (3) who are relations of present Malguzars or former Patels, and whose occupancy right might be considered to some extent as a substitute for a share in the proprietary right in the village; (4) ryots of new villages who had held their fields since the village was founded, or since their fields had been reclaimed from the jungle; (5) those who had held their fields from a date antecedent to this proprietor's connexion with the village as its landlord; (6) ryots cultivating lands which had descended to them by inheritance, provided that the possession, either by themselves and some other persons from whom they inherited, had lasted continuously for not less than 20 years; (7) ryots* of villages in which the Malguzar was an absentee, and had held under 20 years, and, in the Zamindaris, ryots who had held continuously for 12 years and upwards.

The chief features of the absolute occupancy tenure are:—

1. That all ryots recorded in the settlement misl as possessed of an absolute right of occupancy shall continue for the term of the present settlement to pay rent at the rates specified in the settlement record, and shall not during the currency of such settlement be liable to enhancement of rent or to payment of any cesses or fees, other than those leviable by common consent and village custom from all ryots.†

2. That fixity of rent for term of settlement liable only to revision at recurrence of regular settlements from time to time hereafter is to be a permanent incident and a perpetual characteristic of the tenure of the said ryots.

3. That the said ryots shall in future be known as absolute occupancy ryots, holding at fixed rents.

4. That the said tenure shall be regarded as entirely heritable, not only from father to son lineally, but collaterally also to nearest of kin.

5. That the said ryots shall have the power to sublet or otherwise temporarily provide by mortgage or any other like manner for the occupation and management of their land, and that our (the Malguzars') consent shall not be necessary to any such arrangement. Such manager or temporary occupant shall not be liable to pay us a higher rent than that leviable from the absolute occupancy tenant.

6. That the said ryots shall have the power to transfer by sale, gift, or will their occupancy right with all its privileges, on payment to us of a sum equal to one year's rent for such land, provided that in every such case the tenure shall be offered for sale in the first instance to us, at a sum amounting to five years' rent of such land, plus the full value without interest of all permanent improvements effected solely by the ryot, since the fixation of the rent, and shall not be sold to any other person unless we shall for the space of one month refuse or neglect to complete the purchase.

7. That the said ryots shall have power to improve their holdings, sink wells therein, and use canal water thereon, without paying us higher rent than may have been fixed as above.

8. That these conditions shall have force only in respect of the fields which the said ryots shall be recorded in the settlement papers as holding on an absolute occupancy tenure.

In Nimar and Chanda absolute occupancy ryots have restricted powers of transfer and mortgage, but any such tenant who has a right to receive compensation for improvements when he is ejected, has a right to transfer to any person so much of his holding as may be affected by, or cannot be properly separated from land affected by such improvements, together with his right to compensation on ejectment. The person to whom land may be transferred under this rule will hold as a tenant-at-will, unless the tenant from whom he received such land held under an unexpired lease which he could transfer, or possessed a transferable right of occupancy, and shall have transferred the lease or occupancy also. Every absolute occupancy tenant will also be entitled to transfer his holding, or any part thereof, with all its privileges, without the consent of his landlord:—

(1.) To any person who has become by inheritance a co-sharer with him in such holding;

(2.) To any person to whom the holding would descend on his death under the provisions of the law for the time being in force.

Absolute occupancy tenants will continue for the term of the settlement to pay rent at the rates specified in the settlement record, and will not, during the currency of the settlement, be liable to enhancement of rent, or to payment of any cesses or fees other than those leviable by common consent and village custom from all cultivators and authorised by the Chief Commissioner.

In the next class the conditional occupancy ryot is one who has acquired rights under Act X. of 1859. Notice in due form and before the end of Cheit month must be served on such ryot, stating specifically on what grounds the Malguzar intends to enhance rent. The ryot can then contest, or he can wait till the Malguzar sues formally for enhancement or for arrears at enhanced rates. But enhancement is mostly effected by mutual consent.

In the Nimar and Chanda districts all tenants cultivating (save on sír lands) at the time of settlement became occupancy ryots with rent fixed for the time of settlement. During its currency, however, the Patel is allowed to bring one suit, and only one, for enhancement of rent.

All tenants on sír lands and those who have come in since the settlement, or who have, without special

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* This is a special rule for Chanda.

† Supplementary village Wajib-ul-arz.

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CENTRAL PROVINCES.

Mr. Nicholls.

protection, brought in waste lands, as well as transferees of portions of absolute occupancy holdings are tenants-at-will in Nimar and Chanda.

Tenants-at-will in other districts are cultivators on sir lands, those who have fallen from the superior grades, recent settlers in the village, or those who were not at the settlement recorded as privileged holders and have not since acquired rights of occupancy under Act X. of 1859.

In Sambalpur no cultivator can be deprived of his right to cultivate a portion of the ryoti land of the village, so long as he pays his quota of the Government revenue demand.

Service holdings are lands allotted to village servants for the time being for the services performed by them to the village community.

Area of cultivated land occupied under each kind of tenure:—

As to the areas cultivated by each class I find that the holdings are now as follows:—

—	Holdings.	Area.	Average area.	Average rent.	Per acre.
			Acres.	Rs.	Rs. a. p.
Absolute occupancy tenures - - - -	149,715	2,994,300	19½	16⅛	0 13 6
Conditional occupancy tenures - - -	121,807	1,948,912	15½	12¾	0 13 0
Tenants-at-will - - - - -	469,031	6,566,434	14	8⅝	0 10 0
Service tenures - - - - -	51,073	204,292	4	*1½	0 6 0

* NOTE.—This is what the rental would be if the plots were not held on service tenures, free of rent. But no deduction would be made on this account from the total of the village assessment.

The balance of the cultivated land is cultivated by the proprietors,—in our few Byachara villages by the community, the sir, bograh, and other lands by the Malguzars, Patels, and Gaonteahs, and by Malik Makbuzas and Maafidars.

The area is 3,930,763 acres, but I cannot give the number of holdings. The total number of the settled and maafi villages in the Provinces is 36,891. I am unable to give a complete account of the numbers and the holdings of the Malik Makbuzas at the present time.

At the settlement there were in:—

Jubbulpore - - - -	4,180
Saugor - - - -	2,936
Chanda - - - -	4,063
Bhandara - - - -	2,336
Mandla - - - -	62
Damoh - - - -	2,887
Chhindwara - - - -	456
Bilaspur - - - -	1,354
Seoni - - - -	360
Hoshangabad - - -	398

In Wardha their holdings aggregated 149,202 acres. At the settlement there were 15,119 proprietors, assignees of the whole or of portions of the Government revenue demand. I cannot separate the holders of divisions of a village from the holders of whole villages. Since then some of the Malik Makbuza holdings have been purchased by Malguzars or relinquished, and some Maafi holdings have lapsed and become Malik Makbuza holdings.

As to character of the tenure affecting the economic condition of the person holding it:—

Apparently the character of the tenure is to scarcely any perceptible extent the cause of variations of this sort. Tenants-at-will can easily be found better off than the petty proprietors, although the tenants-at-will pay rent plus revenue, and the former pays only revenue.

I know of no conditions of tenure which might be changed with advantage; our settlements are of recent date; the assessments are moderate, the country is highly prosperous; we should now be watchful, but should not disturb men's minds by anticipating or mooting changes of tenure. I am sorry to see the joint proprietors of villages so often resort to partition.

BERAR.

Mr. Dunlop.

BERAR.

In Berar we have the Bombay ryotwari land tenure system. The following description of it by Mr. A. C. Lyall is taken from the "Berar Gazetteer":—*

"The English Government has now (1869) placed the tenure of land in Berar on a stable foundation. After some hesitation (for a settlement on the North-west Provinces model was first actually ordered) the Bombay system of survey and settlement according to the fields has been adopted. The whole country is being surveyed, marked off into plots, and assessed at rates which hold good for thirty years. Subject to certain restrictions, the occupant is absolute proprietor of his holdings, may sell, let, or mortgage it, or any part of it, cultivate it or leave it waste, so long as he pays its assessment, which is fixed for the term of the settlement (usually thirty years), and may then be revised only on general principles, that is, the assessment of an entire district or village may be raised or lowered as may seem expedient, but the impost may not be altered to the detriment of any occupant on account of his own improvements.

Of the restrictions on this principle some are intended to guard the rights of Government, and to check the tendency to excessive subdivision of land, the chief defect of a peasant proprietary system, and the rest to protect the interests of persons other than the occupant who may have an interest in the holding. First, if an occupant wishes to do anything which will destroy the value of his land, as to quarry in it, he must apply for permission to do so, and pay a fine to compensate Government for the prospective loss of assessment. Secondly, not less than the entire assessment of each field is to be levied. If, consequently, one share of a field is resigned, and the other sharers will not take it up themselves, nor get some one else to do so, the whole field must be resigned. Thirdly, a share field once resigned must be taken up again as a whole, and no further subdivision of shares, after the settlement is once made, is permitted.*

An occupant may always resign his holding (or any portion of it, being an entire field or distinct share in one) by simply giving a written notice of his intention before a certain date, which frees him of all liabilities from the current year. When the registered holder alienates his estate he does it by surrender and admittance, like an English copy-holder. Indeed, the Berar occupancy tenure has many features resembling the copyhold estate in the reservations of manorial rights.

Thus, in fifteen years, the Berar cultivator has passed from all the evils of rack-renting, personal insecurity, and uncertain ownership of land to a safe property and a fixed assessment. Yet we should remember

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* Land tenures by cultivation occupancy.

* Part of this brief abstract of the Bombay system of settlement is taken from the "Indian Economist."

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BERAR.

Mr. Dunlop.

that this contrast between the two administrations, which cannot now fail to strike the generation which remembers the assignment of 1853, would not have much impressed the foregoing generation if the country had been transferreed thirty years earlier. The Berar cultivator is lucky in that he came under British management at a time when our Government had sown its wild oats and reaped the fruits thereof; when we had drained the slough of fiscal blunders and blind carelessness in which our Collectors had been floundering, and had placed them on the firm and fertile ground of method and moderation. It would be dangerous to assert that the agriculturist under the rigid, irresistible, unconscious maladministration of the early English school was even so well off as under the conscious haphazard misrule of the native government, which was kept elastic by the possibility of evasion or revolt. This rigid irresistibility is probably the prime cause of our mismanaging (as we constantly do) the land revenue of a new Province during the first years of our administration. Even in 1853, when the Nizam's talukdars had in North Berar made over to us a squeezed orange, we began by attempting to collect the extraordinary rates to which the land revenue demand had been run up by our predecessors, whence it may be guessed that the agriculturists did not at once discover the blessings of British rule.

On the other hand, there are some reasons why cession to the British should have been more popular in Berar than it usually is found at first to be. Peaceful, cultivating communities, living on a dead level of humble equality under strong tax-collectors, got none of those compensations which indemnified the Rajput clansmen of Oude for chronic anarchy, and complete public insecurity. Rough independence, the ups and downs of a stirring life, a skirmish over each revenue instalment, faction fights for land affording a good working title to the survivor, all these consolations were unknown to the Berar Kunbi, nor would they have been to his taste had they been within his power. He had as much land as he wanted without quarrelling with any one; all that he desired was secure possession of the fruits of his labour, and a certain State demand. The classes which lost by the assignment of Berar to British administrators were those who had hitherto made their profit out of native administration, the talukdars, the farmers of any kind of revenue, and the hereditary pargana officials.

The existing occupancy tenures of Berar may be thus classified. Land is held—

(1.) By proprietors who manage each his own plot in his own family.
(2.) By proprietors working together on the joint stock or co-operative system.
(3.) By the *metairie*—halving the gross produce.
(4.) By the *metairie*—halving the net produce.
(5.) By money rents.
(6.) By proprietors employing hired labour.

Land is now very commonly held on the joint-stock principle. Certain persons agree to contribute shares of cultivating expenses, and to divide the profits in proportion to those shares, that proportion being usually determined by the number of plough-cattle employed by each partner. These shareholders have co-ordinate proprietary rights in the land. If you admit a partner without stipulation as to term, you cannot turn him out when you wish to get rid of him, although you can dissolve the partnership by division of shares.

It is not always easy to distinguish proprietary shareholders from sub-tenants; but the partner is he who has put in a share of capital and stock on loan from the proprietor, and after accounting for all advances, receives a stipulated share of the net profit and of cultivation. If the sub-tenant has subscribed any capital, that transaction is adjusted separately.

The *batai* sub-tenure (*metaire*) was formerly, and is still, very common in Berar. These are the ordinary terms of the *batai* contract; the registered occupant of the land pays the assessment on it, but makes it over entirely to the *metayer*, and receives as rent half the crop after it has been cleaned and made ready for market. The proportion of half is invariable, but the *metayer* sometimes deducts his seed before dividing the grain. He (the sub-tenant) finds seed, labour, oxen, and all cultivation expenses. The period of lease is usually fixed, but it depends on the state of the land. If it is bad, the period may be long; but no term of *metairie* holding gives any right of occupancy.

Metairies are going out of fashion. As the country gets richer, the prosperous cultivator will not agree to pay rent of half the produce, and demands admission to partnership.

Money rents are also coming into usage slowly, mainly, I think, because the land now occasionally falls into the hands of classes who do not cultivate, and who are thus obliged to let to others. The money-lenders can now sell up a cultivator living on his field, and give a lease for it; formerly they could hardly have found a tenant.

Many persons now hold substantial estates, particularly in the Berar valley. These are usually village or pargana officials, who have had good opportunities of getting hold of the best fields. Several could be named who are registered occupants of 300 and 400 acres, and a few have larger holdings rated at Rs. 1,000 or upwards of land revenue. It may be affirmed, however, that in almost all instances the land is really possessed by a family of shareholding kinsmen, who assist in the management and divide the profits, not, as in England, by a single proprietor. The large landowners farm most of their fields by hired labour, providing seed and plough-cattle, though, where the lands are scattered in different villages, they are often leased out. The rate of wages of farm labourers is as high as Rs. 8 monthly[*] in the centre of the vale along the railway; in the more backward tracts it falls to Rs. 25 or Rs. 40 yearly, with food and clothing beside. Further down south the labourer still gets a share of the produce only.

The British Government introduced in 1865 a system of leasing for 30 years uncultivated villages upon terms which fix a rental rising gradually with the spread of cultivation. At the expiry of this period, the lessee will be proprietor of the whole estate at the full assessment; or he may refuse to engage for the total area, when he will subside into an ordinary patel.

Government deals only with the registered occupant or Khateedar, and we have no returns to show the area cultivated under each of the occupancy tenures referred to above.

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[*] The rate has since fallen.

Mr. Jones

7. In judging of the replies submitted from this Province, the Famine Commission should remember that, compared with Provinces settled on the North-Western Provinces system, we labour under the disadvantage that we have not at our disposal the great store of information regarding the economic condition of the people which in such Provinces settlement officers accumulate.

To take, for instance, question 9, our survey officers do not, as a rule, prosecute the inquiries to which this question points. The Berar settlement was fixed by officers who admit that they knew little or nothing—

(*a*) of the rental of land, *i.e.*, of its letting value; or
(*b*) of its produce.

The rates determined on were deduced chiefly from the history of past collections, and from the general circumstances of each tract. The minute and careful

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classification of soils required by the Bombay system* to some extent takes the place of inquiries regarding produce; and I am not at all sure that the Bombay officer does not, with his somewhat empirical methods, arrive at results quite as good as those which the Bengal settlement officer arrives at after difficult research. The one thinks of *fields:* the factors which enter into his calculation are few and simple, and, more than all, his calculations are subjected to an instantaneous self-acting test, viz., whether the cultivators keep in their fields or throw them up. The other thinks of *estates:* has to balance wide-ranging probabilities, and his errors are often undiscoverable till years have passed. It is no wonder that the Bengal settlement officer is impelled to inquiries far more minute and intricate than those with which Bombay officers concern themselves. But what I would point to is that, whatever the direct result of such inquiries may be, their indirect value is very great; for a settlement on the Bengal principle leaves behind it a mass of information regarding the economic condition of the people which a Bombay settlement does not, and which in practice is never afterwards supplied. My object is not to show that our system is bad, and the other good. All I am concerned to notice is that the Bengal settlement officer is, by the nature of the ease, impelled to make inquiries which the other is not, and that he leaves behind him information which makes the reports of Bombay settlement officers seem *jejune* † and barren.

Had our settlement reports been fuller, the reply to question 9 would have been much more complete than it actually is.

8. In a preceding paragraph I remarked that Berar presents opportunities, which are perhaps unique, for the prosecution of some of the inquiries which the Famine Commission have in hand, and I gave an instance.

I might have added that the Commission can here learn what the economic position of the ryot is, when he enjoys the whole produce of his labour (excepting of course the Government share), is perfectly unfettered, and has worked under favourable circumstances. There are, no doubt, parts of the Bombay Presidency where circumstances have been even more favourable than in Berar; but, then, those tracts are probably too unlike the rest of the country to be of the highest value as standards. Here, nothing has been exceptional, though everything has been favourable.

9. The example of Berar is of further interest as illustrating the recuperative powers of a tract which bad revenue administration and political unrest had brought into very bad case indeed.

In I think the latest of his well-known works Sir H. Maine throws out the suggestion that a revenue system such as ours is less capable of making energetic and successful efforts in extending cultivation than one in which large properties are the main feature. The theory may be true, but certainly the rapid advances which Berar has made since we took it over is a fact not undeserving of weight on the other side.

10. I should expect, too, that examination of the transactions of the Currency Office at Akola might be subjected to examination with much prospect of useful result. The fluctuations in its cash reserve are enormous, and, as they are produced by Berar trade only, are the reflex of monetary movements affecting the population at large.

11. Our cotton markets‡ again offer to us information of the greatest value; for we can learn there with accuracy the dates on which the crop from the proceeds of which the land revenue is chiefly paid is turned into money; and if we only take the trouble to distinguish between cotton brought to market by cultivators themselves and that consigned by traders, may also obtain a measure, not very complete, but so far as it goes very accurate, of the steps by which the cultivating classes emancipate themselves from the hands of the Banya class.

12. The quite exceptional opportunities which I have had of becoming acquainted with, and comparing the settlement and revenue systems of the east and west of India may perhaps justify my adding a few further remarks regarding their relative merits and defects, so far as they affect the questions with which this note is concerned. To one weak point in the Bombay system of settlement I have already adverted. Another is, that it does not appear to leave behind it the same trained and experienced staff of officers which the Bengal system does. The point is one in which Berar may be peculiar; and I may therefore be mistaken. But so far as I know, there is in the Bombay survey nothing between the European superintendent and his assistants, and purely ministerial officers on low pay. The class of officers who, on the termination of settlement in the east of India, become tahsildars, extra assistant commissioners, or deputy collectors is entirely wanting. In Berar at this moment though the settlement terminated only a month or two ago, there is not a person, European or native, above the rank of a clerk on Rs. 24 or so who has had any settlement experience. And as far as appears this state of things will last for the next 20 or 30 years; and during all that time revenue administration will be in the hands of men who will lack the invaluable training which settlement work gives, and whose tendency will be to regard revenue work as something less important and less interesting than the decision of civil and criminal cases.

13. As an administrative instrument, the Bombay revenue system is, I consider, immensely superior to that of Bengal. The efficiency of the village officers here is marvellous. In the Central Provinces, a good district officer could do much on the occurrence of a crisis like a famine with the help of malguzars; but it is difficult to say what the same officer here in Berar could not do. So far as I can see almost anything might be accomplished. I was some years ago Deputy Commissioner of the Wurdha district of the Central Provinces, on the left bank of the Wurdah river; I am now in the Amraoti district in Berar, on the right bank. The very men who are malguzars in Wurdah are patels here. It was merely through an administrative accident that our patels were not also made malguzars. I have been immensely struck with the difference in the power of handling the two classes which the deputy commissioners of Wurdah and Amraoti possess. The Wurdah malguzar is, I believe, as well disposed and as amenable to advice and as willing to aid as any person of his class anywhere; but his good dispositions by no means make up for the absolute power which the Deputy Commissioner here has over his patels. These men, though often wretchedly paid, cling to their office with, as far as I can see, just as much tenacity as a malguzar clings to his estate; and the knowledge that the least supineness or neglect would in a crisis cause their wattan to be transferred to another would excite them to the utmost exertions. How long this state of things will last I do not venture to predict. Under our rule, and in spite of all we can do, these grand old village officers may lose their prestige; but certainly, considering his resources and emoluments, the patel of Berar is at present a much more useful public servant than the village proprietor across the river, and would be a more trustworthy administrative agent in a crisis.

14. On the question whether cultivators here are better off than cultivators in the Central Provinces, I scarcely like to venture an opinion. I am inclined to think that they are decidedly better off than the

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* I here speak of the mere machinery—the mechanism of settlements—not of the great principle on which our ryotwari system rests. The two things are of course utterly distinct, though often confused.

† Let any one compare the best settlement reports of the Central Provinces with the best Berar reports, and what I now state will be admitted.

‡ I refer here to the great markets of Khamgaon, Amraoti, Shewgaon, and Akola, where every cart that enters the market is registered.

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average* cultivators in the Central Provinces, and that they are more independent and far less likely to go down in the world as cultivation advances and population augments. But it must be admitted, on the other hand, that the number of persons (I am speaking of agriculturists only) who live in what is for them some luxury, and whose example may perhaps tend to raise the standard of living among the whole population, is smaller here than there. It must be remembered also that one is apt in talking of Berar cultivators, to think of the khotidar only; and that information regarding the number of co-sharers and sub-tenants, and the condition of, and the rents paid by the latter is deficient. Hence I do not like to be confident. It is a curious fact that in the Central Provinces, with its malguzari settlement, statistical information regarding the lowest classes of tenants is more complete than it is here. The Bengal system, justly apprehensive of oppression by landlords, insists on full information in the annual village papers regarding tenants of all kinds. The Bombay system, thinking that it has done enough when it has looked after the field owner, does not much attempt to penetrate to the considerable and possibly increasing class beneath him. Yet this is the very information which would be perhaps of most value to the Famine Commission; for it is on the lowest class of tenants and the class of agricultural labourers that the stress of famine first falls.

15. This leads me to remark that I trust that the Commission will recommend that, when the next census of India is taken, the class of agricultural labourers shall be carefully discriminated.

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* There would be little use in comparing the Berar cultivator with merely the privileged classes of cultivators in the Central Provinces.

BOMBAY.

Bombay.

Mr. Peile.

The tenures under Bombay may be divided into occupancy under the survey settlement, and proprietary, which includes political, service, and personal inams and religious endowments.

The only important variations from the ordinary occupancy tenure are the Khotes of the Concan, who are hereditary farmers, and the Narwadars of Kaira, who form village communities with joint rights, the Talukdars (Rajpoot proprietors) of Guzerat, and the Mulgars or superior holders in Canara. These as being all assessed to the Government land tax, are not included in inam, but they possess proprietary rights.

The number of Talukdari (Rajput proprietary) villages in Ahmedabad is 299. The area of similar estates in Broach is 47,017 acres (shares of villages). The Khotes hold 607 villages in Ratnagiri, and 166,181 acres in Colaba, and the Narwadars 70,750 acres in Kaira. All these are included as assessment-paying holdings.

The Collectors offer the following opinions on the latter part of the question.

Surat.—The Collector does not consider that the inhabitants in inam villages are better off than those in our own, except that in time of scarcity, the owners of the villages have time to inquire and means of knowing how far each man can be pressed to pay, and not press him when he cannot pay.

Khandesh (Mr. Propert).—Does not consider inam villages in Khandesh more prosperous than Government villages, and thinks intelligent Government ryots better off than inamdars. Does not think that any changes in the present survey tenure would benefit the holders of the land.

Ahmednagar.—The difference in tenure (occupancy or proprietary) does not affect the economic condition of the holder.

Sholapur.—Mr. Percival thinks the 30 years' leases too long, and that there should be a settlement every 10 years, with an engagement on the part of Government not to raise the rent of fields more than 35 per cent.

Kaladgi.—As a general rule the holders of inam lands, and especially the larger ones, are persons of some position. Their economic position is therefore superior to that of occupants of Government lands. The holders of the smaller inams are in no better condition than the holders of like areas of Government land. The present tenure suits the people and no change is desirable.

Canara.—The muli tenure is proprietary, the holders being Múlgárs. Their tenants are of two kinds. Mulgenidars who have a permanent transferable right, and chálgenidars who are tenants at will. No opinion offered.

Ratnagiri.—The Collector says—In this zillah there are 1,337 villages, of which 607 are held on the *khoti* tenure, 210 are *dharékari*, and 397 are *kitchri*, or partly *khoti* and partly *dharékari*. The rest are *khalsa* or *inám*.

The *khoti* tenure may be thus described. A superior holder, or a coparcenary of superior holders, possesses the hereditary right of settling with Government for the revenue in the gross. The khote, or the different members of a khoti coparcenary, usually hold and farm a small portion of the village lands themselves. The rest of the lands are sublet to tenants, most of whom are privileged tenants, or tenants by prescriptive right, who cannot be ousted so long as they pay the customary, or if agreed, a fixed proportion of the crops to the khotes. The standing crops are annually inspected and the out-turn appraised by the khotes. Only about five per cent. of the tenants are now tenants-at-will, and pay rack-rents, also in kind.

The *dharékari* tenure may be thus described. A dharékari holds his land hereditarily direct from the State, and pays his assessment in cash.

In a *kitchri* village, where both tenures prevail, the dharékari pays his cash assessment to the khote, who is bound to collect such assessment, and should a dharékari throw up his holding it lapses to the khote, who in any case has to pay the revenue. Inasmuch, however, as the area of cultivable land is now far less than is required for the population, *dhara* land is now never thrown up.

The khotes and khoti coparcenaries, therefore, have a direct hereditary interest in the prosperity and improvement of their villages, and by consequence in the welfare of their cultivators, most of whom, even if they fail to pay their rent, cannot be ousted except by a tedious civil suit.

The khotes, therefore, are the grain-dealers of their villages, and in a great measure occupy the position of the sowkars of the Dekkan villages, with the important restriction on rapacity that it is their interest to keep on good terms with, and to support, their old tenants.

In *kitchri* villages a dharékari is often also a privileged tenant of khoti land in the village.

CHAP. I. QN. 10.

BOMBAY.

Mr. Robertson.

The following are the chief tenures—inam, miras, survey occupancy. This latter is the chief or principal tenure. The holder has nearly all the rights of a mirasdar, excepting that the latter can after years of absence come back and relaim his land.

No right can be more secure and more full than that of a survey occupant. It is so well known as scarcely to require description from me. Briefly it may be said that he holds the land so long as he pays the Government rental. His lease is a 30 years' lease. On the expiry of his lease he cannot be ousted, but can of right remain on if he consents to the revision settlement. The increase at the revision settlement is not settled independently for his land or holding, but is a per-centage on that of his village or of a circle of villages, and depends on the rise in value of produce, the opening up of the country by roads and railways, and such like causes. His improvements are not considered and made a ground of raising his rent. He can sell, mortgage, or sublet this land without requiring any consent from Government. In fact he is virtual proprietor subject to a quit-rent varying every 30 years. If Government requires any portion of his land for a road or other public purpose, he can claim compensation, and if he decline to part with his land, Government can only secure the land under the provisions of the Land Acquisition Act.

The full freedom of transfer has, in my opinion, been most injurious to Government, and has been the real cause of the present impoverished condition of the Deccan ryot.

In paragraph 4 of letter No. 2202, dated 6th April 1877, addressed by the Chief Secretary to the Government of Bombay to the Secretary to the Government of India, it is observed :—

✓ "Formerly land in the Deccan was not the property of the ryot, and the ryot's credit was limited. The money-lender, therefore, advanced money with a stinted hand, and for some years after the conquest of the Deccan in 1818, seldom thought of having recourse to the civil courts to recover his debts, but was contented with taking all the ryot's produce, and leaving him only the bare necessaries of life. This state of things attracted attention as early as 1822, and from time to time the misery of the ryots and the danger of it to the State was represented to Government. From 1836–37, however, the land began to be settled on terms which gave the ryots a proprietary title in it. Soon finding the value of this, they began to borrow money upon it, thus to live on their capital. At first the power of selling the land for money debts, a power unknown to native governments, and foreign to the feelings of the people, was not exercised by the money-lenders. As soon, however, as the system of civil justice, introduced by the British, began to be better understood, and the ryots were getting to the end of their capital, suits became more frequent and the people became familiar with sale of land for debt."

✓ This very great concession made to the ryot without urgent need or reason, has, in place of bringing prosperity, carried distress and disaster in its train. I consider if we care for the ryot, if we care that the cultivator, the stay and backbone of our rule, shall be happy and prosperous, we must retrace our steps, undo the evil we have done, and while still securing to him all his other rights, must deny to him the right of either subletting or mortgaging his land. In short, Government should only accept cultivating tenants.

I noticed, when the revision settlement of the Dharwar Collectorate was being made, that since the introduction of the survey upwards of 25 per cent. of the land had fallen into the hands of non-cultivating occupants, persons who held the land at the small Government rental, and sublet it at rates three or four times higher than the Government rate. Thus as regards lands held by non-cultivating occupants, all the benefits of the survey settlement are lost to the poor actual cultivator.

As the case stands, a class of grasping men who were never intended to reap the benefits of our low assessments, now secure those benefits; they rack-rent the ryots for whose benefit the low assessments were introduced, and when the ryot complains of his miserable condition, teach him that it is all due to the heavy assessments imposed by Government.

Col. Anderson.

All land in the south of the Bombay Presidency, in Berar and in Mysore, is held on one of two tenures under Government by the survey settlement, "enam," or entirely or partially free from land tax, or "Government," that is, paying full land tax heritable and transferable and retainable undisturbed so long as the land tax for the time being is paid. This is subject to revision at 30 years' intervals. Enam lands are of two kinds, plots or fields of varying sizes in Government villages, and whole villages of which a considerable proportion exist throughout the southern half of Bombay, a full 20 per cent. of the total villages. The enamdar ordinarily exacts higher assessments than are paid on Government lands. In a large proportion of cases these villages have been, at the request of the enamdar, settled, but it is commonly necessary to impose rates higher than in adjacent Government villages to secure his consent to the settlement. The ryots notwithstanding gain by obtaining a security of tenure which they did not possess before.

I do not think there is any material difference in the condition of the petty enamdar and that of the Government ryot. The ryots in enam villages and in jaghir territory are certainly in an inferior condition of prosperity to those in the Government villages.

As regards any change in relation to unrestricted freedom of transfer of land, it has during recent years become a question whether it would not have been better in the first instance had some check been placed upon entirely unrestricted transfer, but having once been granted by law, it is difficult to see how it can be now withdrawn. I doubt much if any checks which could have been imposed even in the first instance would not have been practically evaded, and whether on the whole they would not have done more harm than good.

Mr. Pedder.

With reference to this question, you will doubtless have very full information regarding tenures from the different Collectors, and I need not touch on them. But there is one point on which the inquiries I have lately been making in connexion with the license tax appear to throw some light.

✓It is very often argued that, whatever advantages the ryotwari system of tenure prevalent in this Presidency may have, it tends to keep the people at a dead-level of poverty, to confine them to agriculture for their means of living; and that, with another system of tenure, one under which the cultivators, instead of being proprietors paying assessment to the State, should be tenants of private landlords, a larger proportion of the population would engage in commerce and manufactures, and the aggregate production and wealth of the community would be increased.

Now, there are two Bombay districts in which the khoti tenure prevails, in Ratnagiri, almost entirely; in Kolaba, to the extent of about half the district. Under this tenure, the actual cultivators are tenants (some customary, some at will) of the khotis, or village landlords.

For comparison with these districts as regards the proportionate numbers and wealth of the trading and manufacturing classes, I have selected the three

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BOMBAY.

Mr. Pedder.

poorest Deccan districts. With the exception of the city of Poona, neither of the tracts under comparison contains any large cities. Neither raises any very large quantities of exportable produce. If anything, the advantage in this respect is with the Konkan, which exports by sea a good deal of rice and wood, while the part of the Deccan selected grows hardly any cotton. Neither tract is remarkable for fertility; but the Deccan soil and climate is very unproductive. The climate of the Konkan tract is favourable to production, and it contains a good deal of very fertile land. The Deccan tract is far inland, cut off from the sea by the Ghâts, and Sattara and Nagar are not traversed by a railway; while the Konkan tract has numerous ports, affording easy and cheap water communication with the great mart of Western India, Bombay, and all trade between the Southern Deccan and the sea passes through it. The Deccan tract has recently suffered severely from famine, the effect of which must have been seriously to diminish the resources of its traders. For these reasons one would, I think, expect to find that the advantage as regards proportionate numbers and wealth of the manufacturing and commercial classes would be with the Konkan tract. The following table, however, shows that this is not the case:—

DISTRICT.	Total population by census of 1872.	Adult male trading, manufacturing, and artisan population by census of 1872, *i.e.*, population assessable under the Act.	Number of those entered in column 3 who have been assessed to license-tax.	Assessment to license-tax.	Proportion of assessable (column 3) to total population; per cent.	Proportion assessed to assessable, *i.e.*, proportion of column 3 having incomes of Rs. 100 a year and upwards.	Rate of tax per head of column 4, being 2 per cent. on the average assessed incomes
1	2	3	4	5	6	7	8
				Rs.			Rs.
Ratnagiri - -	1,019,136	53,323	8,241	43,388	5·2	15·4	5·16
Kolaba - -	350,405	15,289	5,929	34,250	4·3	38·8	5·97
Nagar - -	773,938	48,707	12,446	77,214	6·3	25·5	6·20
Sattara - -	1,061,002	61,137	19,823	1,11,755	5·8	32·4	5·64
Poona - -	967,235	64,175	22,268	1,33,245	7·1	34·6	5·98

These figures tend (I need not say that the inference from an induction so incomplete as this must be accepted with caution) to show that, on the whole, under the khoti tenure, as compared with the very poorest ryotwari or peasant proprietary districts, the trading, manufacturing, and artisan proportion of the population is smaller; that it is generally poorer, and that it comprises fewer well-to-do people; and that the difference in these respects is more marked in the district where the khoti tenure prevails most exclusively.

With regard to the latter portion of question 10, I would state briefly that with the Bombay settlement on peasant proprietary tenure, under which by far the greater part of the land of this Presidency is held, land can be transferred without any restriction, and more easily and cheaply than in any civilised country I know of. Unrestricted freedom of transfer is a product of British law and administration, since strict hereditary entail of landed property was the rule of Hindu law, and the practice till after the introduction of British rule. In my humble opinion we have erred in making the change; it has, in conjunction with our system of administration of civil justice, greatly facilitated the loss of their patrimony by the landowning and peasant classes; and this has caused grave discontent among those the most important, most valuable, and most peaceful orders of the community. It has tended to frustrate the efforts of Government to improve their condition by measures intended to give greater security of tenure, to limit and regulate equitably the State demand on the land, and the like. And, so far as I am aware, it has been attended by none of the social or economical advantages which were anticipated from it. In this, I think, we adopted principles recently established after long discussion in England, without duly considering how different are the circumstances of the two countries; that India is centuries behind England, and that it is very doubtful whether the abolition of all restrictions on the transfer of land would not have been a century or two ago a premature and mischievous measure in England.

But whether we can now retrace our steps with due regard to the interests we have created without doing more harm than by maintaining our present policy, is a question which requires very mature consideration.

SINDH.

SINDH.

Col. Haig.

The agricultural class in Sindh comprises holders of land, large zamindars, and peasant proprietors, all enjoying proprietary rights, and tenants-at-will. The proportion of land cultivated by tenants-at-will is perhaps three-fifths of the whole. As might be expected, such tenants are bad cultivators, and their condition is a poor one. With very rare exceptions the practice is for the tenant to pay a share of the produce, one-third to three-fifths. He has no inducement to increase exertion or improve his husbandry, and he seldom rises—or cares to rise—above a mere hand-to-mouth existence. The class containing the greatest number of prosperous agriculturists is probably that of holders of 30 to 50 acres, who are themselves cultivators, though undoubtedly this could not be said if the large holders as a class possessed the virtues of thrift and industry. The few who are prudent and diligent managers of their property are in very comfortable circumstances, and some are reputed to be wealthy. I should hesitate to interfere in any way with the conditions of tenure.

HAP. I. QN. 10.

MADRAS.

The Board of Revenue.

MADRAS.

An exhaustive description of the tenures prevailing throughout the Presidency cannot be attempted in a set of replies of this kind, and the Board will confine themselves to briefly indicating the leading characteristics of the more important of the different tenures on which land is held under Government, and of the sub-tenures peculiar to the different districts as reported by Collectors.

The tenures on which land is held under Government may be divided into three great classes—

(*a.*) Ryotwari;
(*b.*) Zemindari;
(*c.*) Inam.

The distinctive feature of the ryotwari system, which is the most common tenure in the Madras Presidency, is the direct contract between the Government and the ryot, who is usually the actual cultivator of the soil, and, under existing usage, to all intents and purposes the actual proprietor of the land entered in his pattah or extract from the Government register. A lien on the land is retained by Government till the assessment due thereon is paid; but the right of a ryot to sub-let, mortgage, or sell it, is subject to no other restriction. The ryot has the option annually of increasing or decreasing his holding or relinquishing it altogether; and, this, together with the practice of adding extra charges for second crop when it is raised with the aid of Government water, and water-tax when lands classed as unirrigated are irrigated, and of allowing remissions for loss of crop from causes beyond the ryot's control, renders it necessary to have an annual settlement to determine the amount to be paid by each ryot. The rate of the regular assessment of the holding is never varied at these annual settlements. New assessments now made by the Settlement Department are fixed for a period of 30 years.

The holdings in Malabar and Canara are classed as ryotwari, but in the latter district the rent is fixed as a lump sum payable on the estate or holding, and not, as elsewhere, on each individual field, and in both districts the right of private property in the land, now practically accorded to every ryot in the Presidency, appears to have always existed without interruption.

The village joint-rent system, which prevails to a small extent, is practically the same as ryotwari, though in theory the whole community are jointly and severally responsible for the revenue, the extent of each villager's individual liability being arranged amongst themselves.

The holding of a zamindar is usually a large tract of country, and the zamindar has a proprietary title as against Government, subject to the payment of the land dues or peshcush. In the case of the ancient zemindaries, the law of primogeniture prevails, and the zemindar cannot encumber or alienate the estate beyond his own lifetime if he has sons or son's sons entitled to inherit the property. He can, however, sell portions to save the entire estate, or to clear off family debts. The estates conferred under Regulation XXV. of 1802 follow the ordinary rules of Hindu property, and are described as zemindaries, proprietary estates, muttahs, &c. Poligar estates or polliems are ancient feudal estates, but in many cases permanent title-deeds were granted for them under the provisions of Regulation XXV. of 1802. This, however, does not prevent their following the law of primogeniture according to the ancient custom.

Inam lands (known as jaghires, shrotriems, maniems, &c.) are those with reference to which the Government has waived its right to the assessment, or to a portion of it, as a reward for past services rendered, or as a remuneration for duties to be performed, or on account of religious services to be executed so long as the inam is held. A large number of these inams were granted by former Governments, subject to various conditions, but many have been enfranchised within the last 20 years; the right of Government to prevent alienation, or to resume, or to demand service, having been commuted.

The area of the Presidency may be divided between the three classes as under, all Government waste being shown under ryotwari—

	Square Miles.
Ryotwari - - - -	86,12
Zemindari - - -	33,185
Inam - - - - -	12,455
Total -	131,768

—	Ryotwari.	Zamindari.	Inam.
Ganjam - - - -	6,444	1,672	197
Vizagapatam - - -	5,224	14,278	441
Godavari - - - -	2,153	2,243	707
Kistna - - - -	5,358	1,425	1,039
Nellore - - - -	3,605	2,772	1,118
Cuddapah - - - -	7,009	—	1,041
Bellary - - - -	8,784	145	2,232
Kurnool - - - -	5,404	206	1,645
Chingleput - - - -	1,889	337	417
Madras - - - -	27	—	—
North Arcot - - - -	3,630	2,699	357
South Arcot - - - -	4,653	38	246
Tanjore - - - -	2,456	299	984
Trichinopoly - - -	2,557	669	365
Madura - - - -	2,683	3,431	337
Tinnevelly - - - -	2,987	1,432	409
Coimbatore - - - -	5,739	147	492
Nilgiris - - - -	746	—	2
Salem - - - - -	4,233	1,390	365
South Canara - - -	4,349	—	44
Malabar - - - -	6,195	5	17
Total - - -	86,125	33,188	12,455

With regard to the bulk of the zemindari tracts the cultivated area is not known. Excluding the Maliahs of Ganjam, with an area of 5,715 square miles, the cultivated area under ryotwari and inam is as follows:—

	Square Miles.
Ryotwari - - -	28,671
Inam - - - -	8,558

The most important and widely spread tenure not held direct from Government is that of a ryot or cultivator holding under a zamindar, shrotriemdar, jaghiredar, &c., who, in theory, is usually held to be in precisely the same position as a ryot holding direct from Government, but in practice is not so. The old controversy as to whether the ryot had any proprietary rights in the soil has long since ceased to have any practical interest in ryotwari tracts; the ryot's inviolable right to possession so long as he paid the assessment having been freely conceded and as freely acted upon, holdings being constantly bought and sold without any doubt being thrown on the purchaser's title. Some uncertainty has recently been revived with regard to the exact legal position of the ryot by recent decisions of the High Court; but there is no reason to believe that the general confidence in the well-established policy of Government has been in any degree shaken. In zemindari tracts, however, the ryot's position is far from being so secure, owing mainly to the effect of the decision of the Madras High Court in Special Appeal No. 9 of 1870.

The highest court of the land has declared that a zamindari ryot is a mere tenant-at-will, unless he can prove a specific contract or customary right of occupancy. As specific contracts bearing on the question of right of occupancy are but few, and as it is not easy for a poor ryot to prove customary right as against a zemindar, resistance to a suit of ejectment brought in a civil court is not infrequently unsuccessful. The Board of Revenue looked upon the decision at the time as one of serious importance to the community, and addressed Government on the subject in their proceedings, dated 1st September 1871, No. 3,876, in which, after expressing their opinion that the local Legislature in passing Act VIII. of 1865 (Rent Recovery Act) supposed it had secured the right of occupancy to the tenantry of "zamindars, jaghire-

" dars, shrotriemdars," they strongly recommended that an enactment should be obtained affirming the right in unmistakeable terms. There seems to have been a difference of opinion amongst the members of Government, for nothing further was heard of the matter till 1876, when reports were called for from all Collectors as to the results which had ensued from the decision in question. The reports of the local officers are now under the Board's consideration.

The following remarks by Collectors have reference to this question. A hazy idea is sometimes evinced of what it was that the court actually decided, but all indicate that the decision tends to reduce zamindari ryots to the position of mere tenants-at-will, unless protected by a specific contract:—

Ganjam.—" A zamindari ryot is liable to be turned out at the will of the landlord under the High Court's recent construction of the law.

Vizagapatam.—" In zamindaries, rents have for many years been raised after a slight struggle, at the will of the zamindar. Since 1865 no one has ventured to struggle, Mr. Collett, then Civil Judge, having in that year decided that the law forbidding enhancements without cause shown was a dead letter."

Bellary.—" The law as to the status of tenants under zamindars, shrotriemdars, &c. is in a most unsatisfactory state. Act VIII. of 1865 and the Acts upon which it is based were long considered to declare a right of occupancy in the tenant. That view has been declared to be unfounded by the highest judicial tribunal in the country."

Salem.—" The position of zamindari ryots has undergone a change under the High Court's ruling in Special Appeal No. 9 of 1870, according to which the zamindar is competent to oust the ryot at the end of each fasli, notwithstanding the punctual payments of the kists by the latter. This is, in effect, making him (ryot) a tenant-at-will. This decision is fortunately not very well known, or they (zamindars) would have probably used this as a powerful engine to carry out their own private piques, to the serious detriment of the interests of the ryots, who have sunk capital in improvements in the belief that the tenure was permanent so long as they paid their rents punctually."

The Sub-collector of Madura writes : " The zamindári tenure is a sub-tenure, but in this part of the " country the economic condition of the tenants differs " seldom from that of tenants under ryotwári. The " Government rules are known and very much fol- " lowed in the matter of giving leases and keeping " accounts, but occasionally a zemindar takes advan- " tage of the bad drafting of Act VIII. of 1865, to " inflict some injury on troublesome ryots."

It may be said generally that the occupancy rights of tenants under zemindars and inamdars have been less questioned in the southern than in the northern districts. The Collectors of Tanjore and Trichinopoly write as if there were no doubt in the matter. With regard to many inamdars there can be no room for question that they are nothing more than assignees of public revenue.

Even when the occupancy rights of a zamindári ryot are unquestioned, there is another way in which he is worse off than a Government ryot. The assessment paid by the latter has been commuted for a long series of years into a fixed money-rent, the commutation having been made at rates much below the present ruling market price. The zamindari ryot has usually to pay a share of the produce, and even if this be commuted to a money payment, the rate of commutation is usually subject to frequent revision. In many cases, the payment is actually made in kind, and where this practice prevails, the cultivator is not allowed to harvest his crop until the landlord's share has been secured.

The tenants of Government or zāmindari ryots are usually tenants-at-will, a common arrangement being that half the produce goes to the lessor and half to the cultivator, either in money or in kind. The shares vary, however, in different localities, and frequently with reference to the amount of agricultural stock provided by each party. There are some exceptional sub-tenures carrying proprietary or occupancy rights, and these will now be briefly noticed so far as they are dealt with in the Collectors' reports.

From the Godavari district it is reported that there are sub-tenures with right of occupancy in the Bhadrachellam taluk, but no particulars are given. The Sub-collector of Madura writes : " The ordinary sub- " tenures under lease run from one year to five years, " and the ryot's share is generally by agreement from " one year to five years and hardly ever more. The " occupancy right ceases with the leases, and there is " no claim for renewal."

In South Canara there are three distinct kinds of sub-tenures described as follows by the Collector : " Mulgeni (permanent lease), chalgeni (yearly or " temporary lease), and waidageni (for a fixed " period). The tenant holding under a permanent " lease has full right over the land, including the " right of transfer of his lease. Such permanent " leases are sometimes given by the landlord on pay- " ment of a fine or premium, and the holder of the " land under this lease is rather a subordinate pro- " prietor than a tenant. Under the mulgeni tenure " the tenant has to pay a fixed rent. The next is " chalgeni or temporary lease. These are renewed " every year, and the landlord possesses the right of " raising the rent. Waidageni: under these the tenant " holds the land for a fixed period, with the option of " making improvements, the value of which will have " to be paid by the landlord when the lease expires. " This kind of lease is not very common. The mul- " geni may be roughly taken at 14 per cent., chalgeni " at 84 per cent., and waidageni at 2 per cent."

The Collector of Malabar writes : " The Malabar " system of land tenures is almost perfect in theory. " The highest title is that of an unencumbered " jenmom (birth right), the absolute proprietary " right or *plenum dominum*. Beneath it come great " numbers and forms of usufructuary and other mort- " gages, and at the end of it comes the *verumpattam* or " simple tenancy-at-will. The tahsildars estimate the " cultivated lands under the different kind of holders " in different parts of the district at from 20 to 60 " per cent. of superior title-holders, and from 80 to " 40 per cent. of simple tenants-at-will; but in the " greater portion of the district 75 to 80 per cent. of " the land seems to be in the hands of simple tenants- " at-will. It is the custom of the country, however, " to give the value of all improvements, ascertained " by local usage, when a tenant, even if only a " tenant-at-will, is ejected, provided, of course, the " landlord knew of the improvements being carried " out. The condition of a large proportion of " tenants-at-will is very far from being satisfactory, " owing to the grasping avarice of the landlords, who " in many cases rack-rent their land. Even when " the tenant holds the most common form of mort- " gage lease (kanom) the landlord when renewing the " lease, which can be done every 12 years, exacts so " large a fine from the mortgagee that he is little " better off than a tenant-at-will."

In regard to the character of the tenure appearing to affect the economic condition of the person holding it, the general opinion seems to be that as the position of a Government ryot is in every way more secure than that of a zamindari ryot, and the terms on which he holds more favourable, his economic condition is more satisfactory. The hard and fast lines laid down by Government in respect to payment of dues, &c. sometimes seems to operate harshly when compared with the readiness of some zamindars to allow their tenants time to pay, but the ryot is seldom the gainer in the long run. With regard to assistance in time of distress, the Collector of Bellary remarks : " Recent experience has shown that shrotriem ryots " could get little help from their landlords who were " themselves in difficulties * * * *. " The famine found the Sundur State least prepared

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MADRAS.

'he Board of Revenue.

" to meet it. That State felt it first, felt it most " severely, and is last involved in it, in spite of " excellent European supervision and Government " funds."

Are there any conditions of tenure (such, for instance, as unrestricted freedom of transfer) which might be changed with advantage to the holder and without injury to other parties?

All Collectors who make any reference to the specific instance adduced in this question unite in deprecating any interference with freedom of transfer, and in this the Board concur. Many Collectors recommend legislation to secure occupancy right to the ryots in zamindaries, shrotriems, &c. As already stated above, this question is under the Board's consideration. It may now be remarked, however, that any recommendation the Board may make will be with the view of removing uncertainty with regard to existing rights rather than of introducing changes.

The practice of allowing compensation to temporary tenants for improvements effected with the knowledge of the landlord reported as prevailing in Malabar and to some extent in Canara is one which it might be well to secure by legislation to tenants throughout the Presidency, but the matter is one which calls for much consideration in detail, and the Board are not at present prepared to do more than offer a suggestion.

MYSORE.

MYSORE.

The tenure of the district is ryotwari, which may be described as a sort of perpetual leasehold, with the further advantage that the ryot, when compelled to do so, can resign his lease without any penalty or loss. It has been objected to this system that it subdivides the land too much, encourages a class of petty ryots who almost live from hand to mouth, and the like. This is true in a limited sense, but on the other hand it has raised up, and is still raising up, a large body of independent and frugal men whose conduct throughout the famine has been marvellous. Uncomplaining, and, as a rule, law-respecting, they were reduced to fearful straits, and subsisting almost on nothing, they managed to keep themselves and cattle alive, and, with their carefully-hoarded small stocks of seed grain, were in a position again to till the ground as soon as seasonable rain fell, thereby assuring, it is trusted, not only comparative plenty to themselves, but a fair land revenue to their paramount landlord—the Government. This sturdy independence and self-denial are surely begotten of their quasi-proprietorship with all its binding traditions and religious observances, and thus true husbandry and its concomitants of frugality and perseverance have taken deep root and developed a class of ryots who, in an economic point of view, are probably not to be surpassed in India. There are probably individual classes elsewhere who may be noted for more intelligence or more industry, but as a mass the Mysore ryots are the backbone of the country, and be it noted that it is the tenure that has made the provident ryot, and not the ryot who has developed the tenure. Instinctively almost it occurs to the ryot to foster in every respect and to protect his rights and interests in matters of grazing, fuel, and wood, &c., for what benefits him benefits the Government, and he is not slow to acknowledge his obligation where he has the ability to discharge his Government dues to the last anna.

AJPUTANA.

RAJPUTANA.

Dholpur.—Lieut.-Col. Dennehy.—The tenures in Dholpur are to a great extent similar to those which existed in the North-Western Provinces when British rule was first established.

The ownership of all the land is vested in the State, which claims the power to eject the zamindar, although practically this power is never exercised as long as the State demand is regularly paid.

The State also possesses a right to the waste land within the boundaries of each village, in excess of what may be required for the grazing of the village cattle.

The zamindar is looked upon as a cultivator with rights of general management, and a portion of the rental is allowed to him for the trouble of collection.

Under the new settlement the proportion thus allowed to zamindars averages 24 per cent. on the land revenue of the entire State.

Tenants have no acknowledged rights either of occupancy or of holding at fixed rates. Practically, however, they do hold at well-known and long established rates, and in a thinly populated State they are so much in demand that they are not subjected to much interference in their holdings.

Transfers of land to outsiders are not usual; shares which are sold, either on account of failure of the possessor to meet the Government demand, or from other causes, are generally taken up by some of the other sharers in the village community or by relatives in neighbouring villages.

Kotah.—Major Powlett.—Paragraphs 10 and 14. —In Tonk proprietary right seems to be recognised; for holders can sell their land, and ryots absent for years are allowed on their return to re-occupy their lands.

In Boondee, in Colonel Tod's time, the land was the property of the cultivator;* but now throughout Haraoti, as elsewhere in Rajputana, the land is State property. In Boondee, however, the position of the occupier is much better than in Kotah, where Zalim Singh's handiwork still remains. Thus in Kotah the cultivator cannot sell his land nor mortgage it; though practically such transactions occasionally take place.

A cultivator cannot resign a portion of his holding and retain the rest. He must either keep the whole or give up the whole; and he can claim no abatement of rent in consideration of a failure of crop. In Boondee, on the other hand, although a man cannot sell his land, he can mortgage it freely; and the mortgagee can sub-mortgage it without limit. In Boondee, too, a cultivator can not only give up a single field and keep the rest, but if the crop is not worth the rent, he may turn his cattle into it, and escape any State demand. There are other advantages in the Boondee system which I will not here dwell upon.

In Tonk many villages are given in contract, usually to outsiders; but both here and in Haraoti the tenure is ryotwari. Rents are generally paid in cash, not in kind; and rent-rates, once established, do not vary. Thus, in Kotah, Zalim Singh's rates, imposed 100 years ago, still prevail, though they have been rendered more burdensome by the imposition of heavy cesses in the shape of per-centages on rent, and equal extra charges on all land. However, if fairly distributed, the revenue in average years is not burdensome. The following shows the average mortgageable value of land in Tonk (city pargana) and in Boondee:—

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* *Vide* a very interesting foot note to be found in Chap. VIII. *Annals of Haraoti.*

CHAP. I. QN. 10.

RAJPUTANA

Major Powlett.

—	Good well-land.	Unirrigated average land.
	Rs.	Rs.
Tonk	10	8
Boondee	15	12

In Tonk, where land is sold, the saleable value is, I am told, about double the mortgageable.

In Boondee, judging from inquiries made in two localities far apart, from one-fourth to one-fifth of the land is mortgaged, chiefly to money-lenders.

CENTRAL INDIA.

CENTRAL INDIA.

Mr. Wingate.

Bhopal.—Each village is in charge of a lumberdar appointed for 20 years, who distributes the land among the cultivators at a fixed Government rental on which he gets 10 per cent. commission from the State. Land cannot be transferred from one cultivator to another, so long as the occupier pays the Government rental.

Baghelkhand.—" As has been said before, there are no proprietary or occupancy rights in Baghelkhand, the sovereign of the State being the sole proprietor of such.

" In the Kothao or Khalsa villages, which form about one-third of the total number in the State, both in jumma and cultivated land, leases, as a rule, were given from year to year, in order to prevent any such rights being established. Nearly two-thirds of the whole of Rewah (and the same is applicable to the rest of the district generally) is held rent free under the following tenures :—

" 1. Paipakhar, rent free grant to Brahmins and priests.

" 2. Murwar, rent free grant for loss of life in battle.

" 3. Birt, rent free grant for good service.

" 4. Rajbhog, rent free grant for temple endowments.

" 5. Jaghir, rent free grant in lieu of pay, but is liable to exchange and resumption.

" 6. Muamla, grants to the brotherhood, subject to a payment of one-fourth of the jumma of the village."—*Lieut.-Colonel Bannerman.*

Rutlam.—" The revenue settlement in this district is periodical. The existing settlement is for 15 years. The actual jumma of each cultivator is settled, and during the term of the lease no one can demand from him more than the stipulated sum, whatever may be his improvements. Every village is also given in ejara to the patel of that village, allowing him a reduction from 7½ to 10 per cent. from the gross jumma he is to collect from the cultivators of his village as a compensation for his responsibilities and supervision, besides a rent free plot of culturable ground varying according to the size of each village from 25 to 200 beegahs. He is responsible for the well-being of his village, as well as the full payment of the State revenue whatever may be his own receipts, but he is very seldom a loser. No one has power to make any alteration in the stipulated tenure without the consent of the State. The character of the tenure is favourable and the settlement mild, and therefore popular. The agriculturist having the right of enjoying the profit of his produce and improvements fully."—*Mir Shahamat Ali, C.S.I.*

Manpur.—" In seven of the villages of the pargannah, cultivators, called malgoozars, hold their estates under a twenty years' settlement, which was made in A.D. 1867. They are individually and collectively responsible for Government revenue, and enjoy the right of sub-letting the waste land in their possession on their authority or on rates they think fit to fix within the rates authorised by the settlement. They are thus free to enjoy all the profits which increased or improved cultivation in their villages may bring about. In the remaining unsettled villages the cultivators enjoy no rights, but that by usage they cannot be dispossessed of their holdings as long as they continue to pay Government revenue regularly. The malgoozars of the settled villages are alone recognised to hold proprietary rights, but in no case has any cultivator in settled or unsettled villages ever attempted to exercise the right of transfer by either mortgaging or selling the fields held by him."—*Pundit Suroop Narain.*

CHAPTER I.—QUESTION 11.

CHAP. I. QN. 11.

Are the holders of the above tenures in the habit of carrying out material improvements, such as digging wells or channels, necessary in order to use the water in a canal? Are their actions in this respect affected most by the security or insecurity of their tenure, or by their wealth or poverty? Or are there any other reasons which hinder such investments of their labour and capital? What have been the effects of recent Land Improvement Acts? Have they tended to enlarge or narrow the making of advances by Government? Does the condition of the country render it desirable that the operation of these Acts should be facilitated, or their scope enlarged, and are there any apparent difficulties in the way of doing this that could be removed? Is the demand for interest on Government advances obstructive or prohibitory?

PUNJAB.

PUNJAB.

Mr. Gore Ouseley.

The owners of land, and in some places occupancy tenants, do carry out the material improvements enumerated in the question. Their actions in this respect are affected chiefly by their pecuniary means and by the degree in which they possess provident habits. Many wealthy landowners squander their means without bestowing a thought on improving their estates. The effect of the Land Improvement Acts has tended to enlarge the making of advances by Government. The provisions of the Acts afford, I think, all due facilities, compatible with the safety of the advances made, for their being easily obtained. During the present year special advances to the amount of Rs. 1,80,000 have been made in seven districts only. The rate of interest is, I think, sufficiently moderate.

Chap. I. Qn. 11.

Col. W. G. Davies.

First as regards proprietary tenures.—There can be no doubt whatever that village communities and individual proprietors are in the habit of making material improvements. This is well known to all who have had any revenue experience in this part of India. To obtain particular information as to what had been done in this way in Karnál and Gurgaon I addressed the Deputy Commissioners of those districts. Mr. Ibbetson regarding Karnál writes as follows :—

"During the 35 years since last settlement about 300 masonry wells have been built by them (the proprietors) ; moreover, almost the whole system of canal distributories, which up to within the last 3 years irrigated more than 1,00,000 acres, has been created by the people with such small assistance as the remains of old water channels afforded them."

Mr. Roberts writes with regard to Gurgaon that the settlement operations have lately retarded the investment of money by the proprietary classes in improvements, but that since the announcement of the jamas applications for Takávi have commenced pouring in, so that between June 1877 (when the new jamas were given out) and 1st April 1878 applications to the amount of Rs. 17,325 had been received, of which Rs. 14,000 was paid and the rest would be provided for out of the current year's allotment.

There can be no doubt, I think, that security of tenure has most to do with the investment of capital in improvements in the case of tenants ; for tenants-at-will never, I believe, incur expense in sinking wells or other irrigation works, and tenants with rights of occupancy only to a very limited extent, though the law (sections 37 and 38 of the Punjab Tenancy Act) seems to recognise a right on their part to improve the land in their occupation. In the case of *proprietors*, their tenure being absolutely secure, their wealth or poverty has more to do with the decision of the question of whether they shall lay out money in improving the land, than the nature of their tenure.

It is difficult to say what have been the effects of the Land Improvement Act. Before a sound opinion on this point could be given a special inquiry would have to be made, including a collation of the statistics of the number and amount of the advances made under the old and new rules. My impression is that at first, notwithstanding the more liberal terms as to the repayment of advances under the Land Improvement Act, the number of applications for advances made after its promulgation fell off very considerably. This, however, was not due, in my opinion, to the demand for interest so much as to the cumbrous and rigid nature of the rules issued under it, which require so many forms to be gone through before the advance can be made, and compel repayment with such stern exactness. If we wish to encourage the taking of advances we must simplify the rules and render them more elastic by giving power to the local authorities to relax them where necessary.

It is unnecessary here to enter into any detailed explanation of how this should be done.

Mr. J. B. Lyall.

I propose to write of the Mooltan and Derajat divisions, in which I have been serving as Commissioner of Settlements for the last six years, during which time settlements have been in progress in all seven districts of those divisions.

2. In the whole of this country (excepting parts of Bannu) the rain-fall is too small to admit of land being periodically cultivated with rain-water only; for all regular farming some other means of irrigation are necessary.

In the Trans-Indus country the torrents which flow after storms in the Súliman mountains flood the daman or high sloping plain along the edge of the hills ; the low lands in the khadirs of the Indus, Sutlej, Jhelum, Chenab, and Ravi are moistened by the sailáb or floods from those rivers which occur between May and September.

These same floods fill the inundation canals which in Dera Ghàzi Khan, Muzaffargarh, Mooltan, and part of Montgomery, irrigate certain tracts which are out of the reach of the river floods, or which are artificially protected from such floods by embankments.

Wells are much used to supplement the sailáb in khadir lands ; they are also almost always used to assist in the cultivation of land on inundation canals. Without wells such lands could only grow one kharíf crop, and even that might fail if the canal ran dry for a time.

In the Bár or Thal upland tracts, which occupy the centres of the Doábs between the great rivers, and which are out of the reach of floods or canals, wells are the only means of regular cultivation. But the profits of such cultivation by well alone are always small, and when two or more years of unusually small rainfall succeed each other, many such wells are thrown out of cultivation, ordinarily till better times come, but sometimes permanently. In some parts of these upland tracts the water is too far below the surface or too salt to be profitably used for irrigation.

3. The landowners in the country I am writing about are, of course, in the habit, so far as their means allow, of digging wells and canal watercourses. All the canals have, I should say, as many watercourses as they can properly supply, if they have not more. Wells are, as I have said, agricultural necessities in the upland and canal-irrigated tracts; in sailába or riverside lands they are not so very necessary, and the serious risk of their destruction by floods or diluvion checks their construction. Except in these riverside lands, cultivation has followed the construction of the well or canal, not preceded it.

There is no law that I know of which checks the landowner's readiness to improve his land by digging wells, watercourses, &c. The expectation of having to pay increased revenue does check the making of such improvements to a considerable extent, when the term of a settlement is near its close. I have observed a decided suspension of such works during and immediately before settlement operations, and a sudden outburst of them when the new settlement was concluded. The fact that a new settlement is impending has a greater effect on such works than it ought to have, seeing that it is a rule of our revenue system that protective pattahs for terms of 20 years are granted by Government to constructors of new wells, and for 10 years to repairers of old wells and diggers of watercourses. As this rule becomes more thoroughly known, and as the confidence of the people in our really acting up to it increases, the effect of an impending settlement will greatly diminish.

4. Tenants are not in the habit of digging wells or canal watercourses ; by the custom and feeling of the country it is the business of the landowner to sink a well or dig a new watercourse, and he also has to keep the well in repair, and in some places he does the annual clearance of the watercourse. As I said above, the making of the well or watercourse precedes the cultivation of the land, and therefore the occupancy of the tenant, except in the case of sailába lands, and a tenant of sailába land does not ordinarily hold enough land in one block to induce him to sink a well in it, and like the proprietors he is deterred by fear of diluvion.

Waste lands are often brought into cultivation by agreement between the landowner and other persons, whereby the latter bear the expense of sinking the well or digging the watercourse, and in return become owners of a half or smaller share in the land so cultivated. These contracts are locally known as adhlapi or taraddad-kári agreements; they were formerly more common than at present, as the proprietary right has become more valuable, and the landowners are less and less willing to let it go out of their own hands.

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Punjab.

Mr. J. B. Lyall.

It was also very common in former days for landowners to take a lump sum of cash called jhuri or siropá as a fine on institution, and in return for allowing a non-proprietor to sink a well and to hold the land attached as a sub-proprietor, subject to payment to the original landowner of nothing more than a small fixed quit-rent or proprietary fee. This is sometimes done even now, but the fine, which used to be light, is now heavy, in fact not much below the full market price of the land granted.

There is nothing in the law to prevent tenants from sinking wells or digging watercourses for the improvement of land in their occupancy; the Tenant Act allows them to make such improvements, and the Canal Act has clauses which facilitate the making of watercourses. But of course a tenant-at-will can practically do nothing without his landlord's consent, as the latter can stop his proceedings by serving notice of eviction, and in spite of provisions of the law the majority of occupancy tenants cannot afford to disregard their landlord's wishes.

But in this part of the country most landowners would be delighted to see their tenants make wells or dig watercourses in land not already provided therewith, if the tenants had the energy and capital to do it, and did not demand proprietary right or too great privileges in return. I do not think anything more can be properly done than has been done to facilitate the making of such improvements by tenants.

5. Where the State is the landowner, as it often is, of the waste lands in this part of the Punjab, I think that the present rules for the sale or lease of waste lands are ill adapted to the country, if it is advisable to encourage the extension of cultivation and the digging of wells and canal watercourses in such lands. I have expressed my views on this subject in my review of the Montgomery Settlement Report, and in a letter forwarding to the Financial Commissioner Mr. Broadway's application for the lease of waste land in Jhang.

6. I have had nothing to do with the working of recent Land Improvement Acts, as I have been engaged in settlement work since 1864. In conversations which I have had from time to time with natives I have heard that few advances are taken. The mass of people are frightened by the prescribed formalities, and at the prospect of having to dance attendance at public offices; they also dread entering into agreements with so powerful a party as the Government. Under these circumstances the only men likely to apply for loans to Government instead of to the Saucars are, first, a few influential and intelligent men who feel that they need not be afraid of Government or its officials, and, secondly, unsafe men who cannot get credit elsewhere.

The difference between the rates of interest demanded by the Government and the Sucars will not tempt the mass of the people in the face of the other strong reasons which they have for preferring to deal with the Saucars. I think it would have a good effect in encouraging advances and in other ways if Government asked for no interest except upon arrears of instalments.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. Quinton.

The question deals with two main subjects—1st, the practice of proprietary and occupancy tenure-holders in respect of carrying out material improvements, and the effect on such practice of the nature of the tenure and the wealth and poverty of the holders; 2nd, the operation and effect of recent Land Improvement Acts, and the necessity or desirability of altering them, so as to enlarge their scope and facilitate their operations. The first subject may most conveniently be treated by divisions.

Kumaun Division.—In the Kumaun district proprietors and tenants of both classes frequently make irrigation channels from streams and rivulets at their own expense. Persons to be benefited often give large sums and also their own labour for the purpose. In Garhwál a similar practice prevails among occupancy tenants, but their action is affected by their poverty. In the Tarái district, where Government owns the proprietary right in most of the area, large sums are spent, such as advances for seed and cattle. The Superintendent makes no mention of expenditure for material improvements. The few proprietary zemindars do nothing whatever to improve.

Jhánsi Division.—In Jhánsi and Jalaun the zemindars are impoverished and apathetic as regards improvements, and Marwáris who are replacing them do not care to invest money in that way. In Jhánsi hereditary cultivators are also poor, but are more ready to improve the tract by making "bundhyas" in black soil and digging wells, though as regards the latter they are hampered by traditional custom. In Jalaun all the above tenure-holders dig wells when they can get advances, spending from their ownpurses a sum equal to the advance.

Lucknow Division.—But little appears to be done here, either by tenants or cultivators, in the way of material improvements. In Bara Banki, what little is done is limited to masonry wells. In Unao, some few landlords—but very few—do make wells; no tenant may make a lasting well without permission from his landlord; and in Lucknow the Deputy Commissioner writes that talukdars from apathy, and under proprietors and tenants from poverty, do not carry out material improvements.

Rai Bareli Division.—Wells and drains are made to a greater extent in Rai Bareli than in other districts, owing perhaps to greater pressure of population; they are made mostly by the representatives of village cosharers and seldom by tenants. Over 100 wells were made in 1870 at an average cost slightly under Rs. 200 each. Mr. Blennerhassett considers that security of tenure and possession of means are both necessary or wells to be largely made.

Colonel Perkins, Deputy Commissioner of Partabgarh, shares in this opinion, and states that wells in his district are occasionally constructed by proprietors and well-to-do tenants of all classes, but most commonly by cultivators of the industrious classes, who, though they have no legal security of tenure, enjoy from their small numbers and great rent-paying power a considerable measure of fixity.

Fyzabad Division.—In Bahraich irrigation is rarely resorted to, owing to moisture of the soil and sparse population; and in the adjoining district of Gonda improvements are more extensively made by ordinary lessees and tenants-at-will than by proprietors and sub-proprietors. Apathy and indifference on the part of the talukdar, and poverty on that of the sub-proprietors, are generally the causes assigned.

Benares Division.—*In Gházipur*—a permanently settled district—both proprietors and cultivators are said to carry out improvements in the way of digging wells.

In Mirzapur, with the exception of the Court of Wards' estates and the Mahárája of Benares, non-cultivating proprietors do not carry out improvements. Cultivating proprietors in the ultramontane tracts, and occupancy tenants throughout the district, habitually endeavour, as far as their means will permit, to improve their holdings by the construction of wells, embankments, and tanks. The Collector states that he has found, as a matter of experience, that, without security of tenure, cultivators will not make improvements.

In Benares the consent of the zemindar is held to be necessary for digging wells by all tenants except tenants at fixed rates. Resident zemindars give such

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Quinton.

consent readily, but non-resident zemindars of the baniya class do not easily consent to the construction of a well without a *quid pro quo.*

In Gorakhpur the number of tanks or other irrigation works completed annually from private capital is said to be small. "The Gorakhpur zemindar is not much of an improver."

MEERUT DIVISION.—The Collector of Muzaffarnagar writes that, as a rule, neither proprietors nor cultivators are very ready to spend money upon wells or other improvements, while the Collector of Meerut states that proprietors who are tolerably free from debt, and have a property of fair size, are always ready to make wells. Long and expensive channels for irrigation are very seldom attempted by proprietors from their own resources.

Petty co-parcenary proprietors in Meerut have no incentive to make improvements, and occupancy tenants are never allowed to dig a pucka well through the desire of the zemindars to drive them into difficulties and force them to abandon their tenures.

AGRA DIVISION.—In *Muttra and Farukhabad* proprietors and tenants are said to dig wells and irrigation channels, and similar improvements are made in Etâwah by tenants with rights of occupancy, who form a large per-centage of the tenants throughout that district.

ROHILKHAND DIVISION. *Budaun.*—In most of the villages, except the bhúr tract, tenants, with the consent of the landlords, are in the habit of digging kucha wells, the average depth of water from the surface being 20 feet, and the cost of digging such a well being Rs. 6. When water is deeper masonry wells are rarely made, owing partly to poverty of proprietors and partly to objection of tenants to pay enhanced rent, whether they use the water or not.

In Moradabad, Mr. Alexander, the settlement officer, writes that, as a general rule, neither the proprietors nor the tenants carry out material improvements, except the digging of pucka wells for the sugarcane field, which is done by the tenants. In Bijnor the same state of things exists. Mr. A. Colvin writes: "The habits of generations discourage enterprise; so " does the coparcenary tenure and the prevailing " absence of capital. Kucha wells can be so easily " dug that the want of others is not felt."

ALLAHABAD DIVISION.—Cawnpore landlords and tenants do not care to waste capital in improvements unless driven to do so. Irrigation channels are constantly dug under the Northern Indian Canal Act, and the delay of the Irrigation Department in deciding how far canals are to be extended or modified discourages the construction of wells.

Bánda.—In the Karwi subdivision Mr. Rose writes that improvements are seldom carried out by any class of tenants. Black soil and water 80 to 100 feet from the surface prohibit the construction of wells. The only mode in which improvements are carried out is by embankments, and the localities are limited in which these can be made. They are as a rule constructed by cultivating landlords or tenants with a right of occupancy.

District officers are unanimous that security of tenure and wealth, or, at least, easy circumstances are equally indispensable conditions for effecting material improvements. The Collectors of Cawnpore and Meerut give further special reasons, above stated, why wells are not more extensively dug in their districts; and Mr. H. Harington, Deputy Commissioner of Unao, suspects the greatest check to improvements to be the feeling that at the termination of the existing settlement the benefit of these would be shared with Government. Other officers, however, consider such a feeling to have no practical effect in deterring landholders from making improvements. Mr. H. Harington adds: "At present agriculture is a means of life " rather than a profitable investment of capital. The " intelligence of commerce has not yet permeated to the depths of the bucolic mind." Mr. Watts of Farukhabad suggests as another reason which hinders such investments of labour and capital the proverbial apathy and ignorance, and the crass conservatism opposed to all innovation, of the agricultural class; and Mr. Alexander, in para. 31 of the answers from Moradabad, enumerates several other causes arising from the peculiar character of the population of that district.

As to the second branch of the question, district officers are also unanimous that the Land Improvement Acts have had little or no effect. No reply has been given to the question as to whether they have tended to enlarge or narrow the making of advances by Government. Most agree that the operation of the Acts should be facilitated, and point out difficulties for removal.

The difficulties which at present hinder the working of the Acts are—(1) the minuteness and expense of the initial procedure before an application can be acceded to. For instance, the delay and vexation of the preliminary local inquiry, the execution and registration of a bond, the cost of the stamp, and the worry of dancing attendance at courts and offices till these operations have been completed, when the mahájan is ready to advance money, doubtless at higher interest, which does not much concern the borrower, without any of these inquisitive formalities.

(2.) *The demand for security.*—This is a great obstacle. Persons with good credit have no difficulty in getting money from the village banker without trouble; so that the only customers left for Government are those whose credit is shaken, who have difficulty in giving security, and without security Government will not lend.

(3.) *The rigidity of the rules for repayment by instalments on fixed dates.*—The mahájan will allow the amount to run on and take sums on account when the debtor can give them; but no such leniency can be shown by the tahsíldar, whose efficiency is estimated by his success in punctually realising the Government demand. It not unfrequently happens that a well has failed from some imperfection in the site or defect in construction, and for such cause no allowances are made.

(4.) Another cause assigned is that in coparcenary communities, shareholders cannot agree as to the proportion in which the water is to be divided.

On the question of the demand for interest being obstructive opinions are divided. The majority of officers hold that it has no obstructive effect. The Collector of Benares (Mr. Church) is of a contrary opinion. Mr. Sandys, of Budaun, would reduce the rate to 4 per cent.

The officiating collector of Meerut states that obstacles are too readily thrown in the way of applications by the native officials, from whom, in case of advances, incessant watchfulness is required to prevent the money being applied to other purposes. He thinks that a per-centage granted to the tahsíldar might have a beneficial effect, and the settlement officer of Moradabad is of opinion that a successful working of the Act cannot be looked for until a special officer is deputed to superintend it, travelling about the districts the greater part of the year and finding out the persons who are fit to receive advances, and making generally known the terms on which they will be granted.

The Deputy Commissioner of Jalaun recommends that the scope of the Act should be enlarged by granting advances for the purchase of seed and plough bullocks; and Major de Montmorency (Bahraich) believes that "by the systematic apportionment of a " district into groups of villages, by restricting " advances for the construction of wells within each " such group until its requirements were satisfied, and " by employing at the rateable charge of the borrowers " a few skilled well men to superintend the most difficult " part of the operation of well sinking, something

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Mr. Quinton.

" more effectual would result than from the existing " desultory system of granting takávi to scattered " parts of the district where the revenue officials " cannot maintain a continuous and effective super- " vision."

The Collector of Bareilly would make advances to landlords without interest for the purpose of sinking masonry wells, merely as a slight safeguard against drought, but considers it useless to attempt to induce tenants to sink capital in improvements, as the greater part of the profits will infallibly be taken by money-lenders. The rainfall in his district is generally so ample that he doubts if it would pay to increase irrigation to any great extent.

Mr. Rose, from Karwi, is of opinion that the Act should allow advances to tenants as well as to landlords, and that thereby more land out of cultivation would be brought under the plough. The rate of interest should be lowered and the procedure simplified. Mr. J. Simson notes that the latter is a specially important point, and that the present rules are far too cumbrous and detailed.

The Board of Revenue.

6. The Board consider (as they have always held) that the demand of a high rate of interest is the greatest deterrent to borrowers. They would make interest payable only on instalments which are in arrears, reducing the 12 per cent. of the Board's Circular IV. of 1841 (para. 29) to 6 per cent.

7. Perhaps an equally powerful deterrent is the provision in section 15, Act XXVI., 1871, to the effect that an arrear of takávi shall be recoverable as if it were an arrear of revenue due on the land. Two or three bad seasons following the year in which takávi repayments commence may make it impossible for the zamindar to pay up his instalment. He is told, if he fails to pay punctually, he may lose his land altogether.

8. The Board do not think it would be fair to attribute the "non-efficiency of the recent Act" either to want of activity on the part of Collectors or of their subordinates in urging such loans and informing the people thereof. The Collector, while he "urges such loans," must in common honesty inform the people that they will have to pay 6¼ per cent. interest on the amount advanced, and that if they do not pay their instalment, their land may be sold for recovery of the arrear. The Senior Member has been met, when urging zamindars to take advances, by the objection that they have to pay interest, and they had rather get the money at much higher interest from their mahájan than run the risk of being treated as land-revenue defaulters.

9. Nor does it seem fair to attribute the failure of the Act to the opposition of tahsíldars when the reasons for its failure are shown to be contained in the Act itself.

10. The indebtedness of the people is not a new cause of hindrance, and is of course a great bar to any improvement to be effected by the people, either directly at their own cost or by loans from Government or others. This is one of the main arguments in favour of a compulsory system.

11. The records of their office do not enable the Board to get any satisfactory statement of takávi advances to show the decrease due to the Act and rules thereunder. A statement is, however, enclosed which will show the sums advanced from 1857–58 to the end of the revenue year 1877–78.

STATEMENT showing the Yearly Amount advanced as Takávi in the North-West Provinces from 1857–58 to 1877–78 inclusive.

—	Meerut.	Kumaon.	Rohilkund.	Agra.	Jhansi.	Allahabad.	Benares.	Total.
	Rs.	Rs.	Rs.	Rs.	Rs	Rs.	Rs.	Rs
1857–58 - -	—	—	—	—	—	—	—	—
1858–59 - - -	16,000	—	350	—	—	1,990	—	18,340
1859–60 - - -	1,813	—	2,400	350	—	7,100	—	11,663
1860–61 - - -	7,795	—	1,963	5,836	—	12,691	—	38,285
1861–62 - - -	68,203	—	2,995	20,218	—	6,869	—	98,285
1862–63 - - -	24,393	—	855	18,210	200	2,063	—	45,721
1863–64 - - -	4,300	—	1,350	8,195	1,310	1,287	—	16,442
1864–65 - - -	5,825	—	1,110	17,927	13,537	—	—	38,399
1865–66 - - -	1,588	—	580	17,080	10,940	40,732	—	70,920
1866–67 - - -	14,100	—	117	6,650	4,727	7,350	—	33,944
1867–68 - - -	2,375	10,000	600	6,100	6,654	1,300	—	17,029
1868–69 - - -	21,254	—	8,399	3,075	84,744	7,081	2,136	136,689
1869–70 - - -	39,544	—	53,521	52,547	1,35,095	85,372	6,535	422,614
1st April 1870 to 30th September 1870.	400	—	850	250	87,210	77,915	—	166,625
1870–71 - - -	1,627	—	600	1,899	1,100	52,793	—	58,019
1871–72 - - -	7,538	—	—	1,949	450	300	—	10,237
1872–73 - - -	22,470	—	—	1,050	19,876	1,150	—	44,546
1873–74 - - -	10,927	—	1,200	581	11,034	5,907	10,234	39,883
1874–75:								
Under Land Improvement Act.	7,172	—	120	2,250	1,526	5,615	—	16,683
Outside Land Improvement Act.	—	—	5,000	—	8,992	3,439	—	17,431
1875–76:								
Under the Act -	1,775	—	800	2,800	1,707	2,704	—	9,786
Outside the Act -	2,838	—	—	5,000	11,622	20,068	1,455	40,983
1876–77:								
Under the Act -	1,775	—	500	1,085	2,318	3,115	—	8,793
Outside the Act -	39	—	—	642	12,955	16,961	399	30,996
1877–78:								
Under the Act -	12,975	—	3,540	15,925	10,571	23,757	1,775	68,543
Outside the Act -	2,031	··	81,313	142,559	31,445	12,233	29,153	298,734

BENGAL.

BENGAL.

Ir. Toynbee.

Holders of tenures in Bengal of the nature of those described in the previous paragraph have never been in the habit of carrying out improvements in the lands they hold. Their sole idea of any advance in this direction is the extension of cultivation to lands not hitherto cultivated, not the improvement of those already under cultivation. The former procedure is in accordance with their rigid and inflexible law of custom, the latter is not. The increasing pressure of the population on the soil works in the same direction. They are content to live and to cultivate as their ancestors did before them. The bulk of the cultivation in Bengal is that of rice-lands, and it is exceedingly difficult to say how, in the great low-lying, rice-bearing tracts, any such material improvement, such as is indicated in question 11, would be feasible. In most years the rains of heaven suffice for all the wants of the cultivators. Tanks and wells would only run dry in dry seasons. Even where they exist, they are never used for rice irrigation. In the purely rice-growing tracts of Bengal, therefore, improvements could only be effected in the shape of large projects of insurance by means of irrigation, which, even if feasible from an engineering, would certainly be impossible from a financial, point of view. In Behar and in parts of Chota Nagpore, where *bhadoi* and *rabi* crops are grown, the improvements indicated in question 11 are, to some extent, carried out. In the Sonthal Pergunnahs and other hilly tracts, small streams are bunded up, and water is thus collected for the rice grown on lower-lying lands. In south Behar there is a system of collecting surplus rain and river water into reservoirs and using it when the rains fail. For dry cultivation, wells are dug when the nature of the soil permits. But whatever is done is done according to the custom of the country handed down from time immemorial. No new line is struck out. All the improvements mentioned above are on a small scale and generally limited to one village or one estate. There is no power of combination among either landlords or tenants either of the same or of different estates to work together for the common good. There is no energy or enterprise to act as an incentive to improvement; every cultivator is content to live as his fathers lived before him. Landlords and middlemen are merely rent-collectors; they take no interest in their estates or tenures. If any improvements were feasible, it would be necessary to look to the actual cultivator for them. Insecurity of tenure and fear of enhancement of rent act as a bar to the digging of wells, the only improvement within the means of the individual cultivator. But on the other hand it cannot be said that those whose tenures are protected by law are much more ready to improve their lands than others. Wealth and poverty hardly affect the question. Those who have wealth prefer to spend it on social and religious ceremonies. Those who have not, have no care beyond the daily provision of food for themselves and their families. Both classes move helplessly in the groove of custom; that custom is to take as much as possible out of the land and to give nothing back to it. It is possible that as the pressure of the population on the soil increases, and as the margin of cultivation advances, necessity will hereafter compel the people to adopt an improved system of agriculture, assuming for the sake of argument that the present system is not the best that the circumstances of the country render possible. Nothing but necessity can overcome their present indifference, and if in times of distress the people are to come on the hands of the State this indifference will tend rather to increase than to diminish.

The Land Improvement Act has been practically a dead-letter in these Provinces. In the year 1876–77 only Rs. 975 were advanced, and in 1877–78 only Rs. 459 in the whole of Bengal. In the famine of 1874 large advances were made under the Act, but neither its letter nor its spirit were complied with, and the money was devoted to purposes quite foreign to the improvement of the land, unless the saving of the lives of those who cultivate it can be so called. The advances are not wanted, or they would be taken. The procedure is somewhat elaborate, but, on the other hand, if it were not so, there would be the fear of advances not being applied to the objects for which they were ostensibly granted. The rate of interest charged by Government is far lower than that paid on loans from mahâjans and others, and cannot in any way be said to be prohibitory. But there is this difference in the favour of borrowing from the latter, that he is not inflexible in his demand for punctual repayment in strict accordance with the agreement, and will, if necessary, accept payment in kind. The Government has all the machinery of the law at its back to enable it to recover the sum advanced; the costliness of the law for the private lender makes him prefer the customary mode of renewing the loan on payment of a consideration. Generally it may be said that the Land Improvement Act is not required for these Provinces, because the people have not the slightest desire to avail themselves of it, and because if they had, the objects on which the money could be expended so as to yield a fair return are either not known or do not exist.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.

The opinions of far more experienced and able officers of the Commission are happily available in discussing these questions, but I trust the deep interest I feel in the subject will be held to excuse my offering my views on them.

We have no canals from whence to draw water. Channels from rivers are, I may say, unknown.

Tanks are constructed just as often by non-agriculturists, men of wealth, for "dharm," as by agriculturists. Tanks would generally be beyond the means of ryots or villagers other than malguzars. Wells also are constructed without regard to agricultural prospects. Open fields would hardly be converted into embanked fields by others than those possessed of proprietary or occupancy rights or tenants-at-will holding long leases, with fair prospects of not being harassed, by reason of their possessing more valuable fields, into relinquishing their holdings.

Waste lands, again, are almost always brought into cultivation under "pagras" leases or special agreements. Permanency of high rates for produce and pressure of population will determine the advance of the area of regular cultivation.

Question.—Are their actions in this respect affected most by the security or insecurity of their tenure or by their wealth or poverty?

The poor man, whatever tenure he may enjoy, cannot lay out the necessary capital. The wealthy man with a secure tenure is more likely to effect a permanent improvement by making a tank or sinking a well or embanking his fields; as he probably knows the value of wealth, he prefers an immediately reproductive outlay and benefit for his fields.

The wealthy man with an insecure title who wishes to perform an act of merit in his village is, I think, more likely to plant a tree, or clump of trees, or a grove.

Are there any other reasons which hinder such investments of their labour and capital?

For an answer to this question we must look to the past political and fiscal history of our country. The effects of the ravages of the Pindharis have lasted longer on the minds of the people than on the face of

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Central Provinces.

Mr. Nichol.

the earth, and the oppressions of the later days of the Mahratta power, I think, still check to an appreciable extent the employment of capital, and tend to make it against the "custom of the country" to lay out money merely for the sake of improvements. To have done such a thing, not so very many years ago, would have been almost suicidal. The history of the Nerbudda valley shows this clearly.

I think that the custom and desire to keep wealth in a form in which it could be removed or hidden, and the great disinclination to tell even what had been the produce of their fields was rendered almost hereditary among the people by the wretchedness of those times, and to the present day they have not acquired sufficient confidence in the stability and long enough experience of the high principles of Government to counterbalance all these traditional and habitual restraining influences and induce them freely to lay out their own capital to any considerable extent in permanent improvements to the land, at least, on works of more permanence than field embankments. In this, I limit myself to cases where religious feelings have no share in influencing the cultivator's employment of his surplus cash.

To this inherent dislike to spend money openly and to lock up capital in unconvertible masonry or earthwork there are other considerations to be added. The great majority of the people have not the means, or, if they have the means, are too apathetic to take steps for increasing the yield of their fields, or like Mr. Elliott's true *kirsan* of Hoshangabad only look with pride to broad acres, and think permanent improvements and manuring and irrigation as little peddling matters. The expanse of our lands compared with the paucity of cultivators, coupled with low prices from want of outlets for our superfluous produce hitherto have not necessitated their looking out for new and expensive means for increasing the produce of their fields. A man with a surplus of cash will look out for more land, or will buy more cattle, rather than lock up his capital in permanent works.

In Chhattisgarh, in addition to all these deterrent influences, is to be superadded the insecurity for investments in land, where the custom of shifting tenures exists or might be revived. On the whole, I am inclined to think that it will take a long time before these causes cease to have effect, before the agricultural classes will lay out much capital on petty irrigation works, actuated thereto solely by a desire to increase the yield of their lands. Individual cases of more enterprising and more industrious men, especially of the Mali, Kachi, Ponwar, Bhori, and Kori (of Bhandara) castes will no doubt come to notice, and so will those in which tenants-at-will, having confidence in the generosity of their landholders, invest their savings in the irrigation of their fields.

But at present the incentives of permanent high rates with brisk markets for produce, and pressure of population, have not come into general operation.

Effect of recent Land Improvement Acts :—

I show the figures for many years past.

1865-66 - -	26,530	
1866-67 - -	34,675	
1867-68 - -	21,550	
1868-69 - -	77,380	Famine years.
1869-70 - -	146,213	
1870-71 - -	14,375	
1871-72 - -	6,775	The law came into operation in 1871-72, Act XXVI. of 1871.
1872-73 - -	21,875	
1873-74 - -		
1874-75 - -		
1875-76 - -	3,120	
1876-77 - -	2,940	
1877-78 - -	7,515	

It would thus appear that the sums now advanced for the permanent improvement of lands have dwindled very greatly, and in the past year nearly all of the advances were made in Chanda, Saugor, and Balaghat.

When we had no intricate formalities to go through, no delays in giving out advances, and not so much trouble with stamps and registration, and especially when we had no summary method of realising arrears, we made no bad debts, and the intentions of Government were more adequately responded to. But the fact is that Government is thought to be a hard creditor, and in addition to the perhaps needless worry at Cutcherry before the money is advanced, and the minute inquiries in his village, the borrower is haunted by the anticipation that if he should not pay up on the exact day fixed, or the next day, he is liable practically to arrest in the most public and obnoxious way. A money lender on the other hand would give time, or at the worst would have to proceed by regular suit in the civil court, and this is the chief reason why the people are now positively reluctant to apply for loans from Government, except when they find the Deputy Commissioner for the time being is especially interested in this matter. The over ingenuity of the Act and the first set of rules strangled it. I think all that is necessary is a simple application coming from a cultivator or proprietor of good character, an assurance that the village proprietors and people have no objection, and reasonable security, such as the sanctioning authority might be satisfied with. In the ordinary course of events it would be found out if the loan had been misapplied. Should this be the case the refund should be required after two or three months' notice, and arrest or *quasi* arrest should not be resorted to. For the security bond, which should be made as simple as possible, I think the Government of India might specially exempt such deed from stamp duty and registration, and that Deputy Commissioners, subject to the rendition of proper reports, so long as the security continued satisfactory, should have a large discretion in allowing a period of grace or deferring the payment of an instalment, and that neither the person or property of the debtor should be touched till after the surety had received notice of not less than a month to arrange matters with the Deputy Commissioner, or if more convenient, at the Tahsili.

I think this would make such loans as popular as they now are unpopular.

It is to provide for times of famine that many cultivators and Malguzars, perfectly solvent, like to keep their names on the debtor's side in the books of Mahájans who are known to hold stocks. I am inclined to think that a distinction might be well made in cases where we lend money to purchase seed, grain, and cattle in famine and in panic times. We have always required very prompt payment. Where there are prior liabilities and existing liens this must be insisted on, but, when the time of payment comes, famine and panic having passed away, and mutual trust and interests having again re-established the debtor's credit, then if the debtor can give good security, I see no reason why the debt should not be made repayable over some two or more years.

I think the scope of the Act is wide enough, but that the rules are troublesome and impede its utility.

I think as a provision against famine and as a material improvement to the country at large, it is highly desirable that the operation of these Acts should be facilitated.—*First*, there would be the direct return from the capital thus laid out. *Secondly*, the example of Government proving its confidence in its own stability and progress and in the wisdom of such undertakings would bring private capital into the same field. *Thirdly*, there would result a general tendency to a lowering of the traditional and customary rates of interest charged to agriculturalists.

The foregoing answers indicate my opinion that the law does not check the permanent improvement of the land nor expectations of future enhancement of the revenue assessment. There may be, and probably is, some slight check more in individual cases than as a general condition of the country, owing to apprehensions of indirect pressure and of enhancement of rents, cut the determining cause is the ability or inability to bommand and apply capital.

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CENTRAL PROVINCES.
Ir. Nicholls.

The digging of a well and the planting of a tree rank only as meritorious actions, after the begetting of a son, with a view to future life. It follows that many wells are dug without regard to the improvement of the adjacent lands and of rent and the incidents of tenures.

For purely agricultural wells uncertainty of tenure may act as a check.

The Saharanpur settlement rules regarding the digging of wells are embodied in the Wajib-ul-arz, or village administration paper.

For example, in the Hoshangabad district, the clause runs thus:—

Rights to wells, "All vested rights in wells now "existing shall be maintained and preserved. If any "person now owning a well shall give up his land or "shall be ousted in default of payment of rent, or "shall die without heirs, the wells shall become the "property of us, the Zamindars. In future any cul-"tivator may without our permission dig wells in his "own land, but he shall have no interest in the wells "as soon as he loses his interest in the land in which "it is dug. Since no irrigation is now carried out, "we will advise and persuade the cultivators to adopt "the system of irrigating their fields."

When a landholder elects to purchase, under his right of pre-emption, the holding of an absolute occupancy ryot by giving him the equivalent of five years' rental, the ryot is entitled also to receive full value without interest of all permanent improvements effected solely by the ryot subsequent to the fixation of rent.

The occupancy ryot is protected against enhancement of rent on account of his lands having been permanently improved by him, under the provisions of Act X. of 1859.

If he or the absolute occupancy ryot suffers himself to be ousted for arrears of rent, he gets no compensation. In Nimar and Chanda the recorded absolute occupancy tenant cannot transfer or mortgage, but has *a right to receive a compensation* for improvements, when ejected, and may transfer to any person so much of his holding as may be affected by or cannot be properly separated from land affected by such improvements, together with his right to compensation on ejectment. The person to whom land may be transferred under this rule will hold as a tenant-at-will, unless the tenant from whom he received such land held under an unexpired lease which he could transfer, or possessed a transferable right of occupancy, and shall have transferred the lease or occupancy right also.

An absolute occupancy ryot can also transfer to a co-sharer by inheritance, or to a person who at the tenant's death would inherit the land.

In Chhattisgarh much good has been effected within the last 14 years by grants by Government of rent-free plots to persons who construct roadside and village drinking wells or establish roadside groves of specified dimensions. But these measures have been adopted for the convenience of travellers, and on sanitary, not agricultural grounds.

As for anticipations of increase of the revenue demands, in the first place, our settlements as yet have a long term to run; secondly, the people have faith in the moderation of Government. Therefore I think that there is no limiting of the execution of permanent improvements on this score.

As for increase of rent, Malguzars for their *sir* lands, and proprietors of holdings (Malik Makbuzas) and Maafidars, and generally service holders, pay none; absolute occupancy ryots are not liable to increase of rent for the term of settlement; conditional occupancy tenants are, I think, in this respect, fairly protected by law. Only in case of a repetition of the story of Naboth's vineyard are they in danger. Improvements to their lands might tend to increase their danger of losing their rights, not by legal process, but by indirect ways. The Malguzar, if powerful, can make it very uncomfortable for any villager, to retain what he considers adverse rights, and practically, the only things to support the ryot exposed to indirect pressure are such public opinion as exists, the discountenance of Government officials, and the support of a money lender. Reckoning on his own solvency, on a long lease, or such supports, and the personal character of the Malguzar, of the Malguzar's family, or of some of the co-sharers in the malguzari, a tenant-at-will may exceptionally undertake a work of permanent improvement, but generally he will be influenced by other considerations than hopes of enjoying adequate returns for his outlay.

Mr.
arles Grant.

The official returns, quoted by Mr. Nicholls, show what is notoriously the fact, that little recourse is had to the Government for loans under the Land Improvement Acts. The cause assigned for the indifference of the people to the advantages held out to them is that, though the terms on which the Government lends money are far more moderate than those obtainable in the open market, they are in some respects more onerous; for the main object of the private money-lender being to attract customers, and keep them in his books, everything is made easy for them till the time comes to sell them up; whilst, as the Government, on the other hand, lends money solely for the purpose of improving the economical condition of the people, it is bound to see that its advances are legitimately applied and regularly repaid, even at the cost of some friction. Further, even if the poorer cultivators had sufficient regard for their own interests to prefer immediate trouble to the risk of future ruin, they would often fear to lose the support of local capitalists, on which they now count in times of difficulty, by seeking loans from other sources. The substitution of some less injurious agency for private bankers who now "finance" agricultural operations throughout the greater part of the country opens out questions too large to be discussed here, and is beset, moreover, by serious political, as well as economical, difficulties. But something might, no doubt, be done to simplify the distribution of loans for actual improvements. The initial difficulty is, of course, to guard against the risk of advances, taken ostensibly for these purposes, being applied to other uses; as, for instance, a sum of money borrowed for a well being spent on a marriage. In order to prevent funds intended to aid improvements from being used to foster waste, the Government is obliged to hedge round its advances with checks and precautions; and as the machinery by which effect is given to the necessary formalities, is over-taxed and sometimes over-centralised, a Government loan is attended by so much delay at first, and so many restrictions subsequently, as to make it little desired. In this, as in other "non-regulation" Provinces, the principle of administration is to combine executive and judicial functions in the same official; and probably no one who understands the condition of the country and of the people, will dispute the advantages of the existing system. But as time has gone on, the work of the courts has enormously increased, and many of those entrusted with the administrative management of the country, are little better than slaves to the Bench. The Administration is doing what it can by savings and re-arrangement to relieve the pressure where it is greatest; but we shall very soon have reached the limits of economical re-adjustment; and must either increase our establishments or content ourselves with a rougher and simpler standard of work.

In the case now under discussion the alternative would, I think, be between entrusting the distribution of agricultural loans to a special agency, or making up our minds to submit to occasional loss and malversation. So long as advances are only available through Tahsildars, who, however much we may try to relieve them, will always be very fully occupied, CHAP. I. ON

CENTRAL PROVINCE

Mr. Charles Gr

and who, living far as they do from any supervising authority, often conduct public business loosely and irregularly, it is impossible to hope that the local inquiries necessary to satisfy the Government of the good faith and solvency of the applicant will be promptly and smoothly made, and that there may not be instances of unreasoning pressure in exacting repayment. Both the preliminary inquiry, and the subsequent dealings with the borrower, require time and judgment, which an already overworked Tahsildar is often not in a position to give. Possibly the duty of superintending agricultural advances might be undertaken by the special officers, whom there has been a question of appointing in this Province (and who have, I believe, been appointed in Oudh), for the management of estates belonging to minors or embarrassed landholders, and for the time being under the charge of the Collector. One great difficulty in creating these appointments has hitherto been that the cost of maintaining them would diminish the chance of redeeming encumbrances on estates taken over simply to free them from debt. But if part of these charges were debited to management of an agricultural advance fund, both objects, viz., the free diffusion of agricultural loans and the efficient management, at a comparatively low rate, of encumbered estates, would be to some extent attained.

The only other alternative would be to provide that officers of all grades, down to that of Tahsildar, should keep the subject of agricultural loans prominently in view on their periodical tours, and should be supplied with funds, and otherwise empowered to make immediate advances to approved applicants. Any such system would be open to many obvious risks, as, for instance, that there would be a diversity of practice, and that loans would be therefore irregularly distributed, that they would not be available throughout the year, but only when chance or the exigencies of the service brought an official in the direction of the applicant's village, and that, if loans are to be more easily made than at present, unpractised officials might sometimes be taken in. But I think the last of these dangers would be also the least. There is probably still enough respect in the country districts for the central power to prevent general or even frequent attempts to impose on an officer of Government, brought face to face with the applicant. Under such circumstances it is probable that loans would rarely be taken without a more or less unreserved intention to apply the whole or part of them to their ostensible purposes; and in most cases there would probably be little subsequent deviation from original intentions. There would perhaps be more danger of repayments falling into arrear, or even altogether failing, if present safeguards were relaxed, though they might be partly replaced by increased personal supervision both in granting and in recovering loans. But this again implies heavier calls on the time of the supervising officials, and leads back to the conclusion that a system of Government advances to agriculturists can never be successful or popular until it is worked by separate officials, having time enough to dispense with paper checks, and to treat directly with borrowers.

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Mr. Dunl

Lieut.-Col. Menzies.—Amraoti.—" Those who hold garden lands improve their holding. In addition to clearing out old wells, I estimate that from 75 to 100 new wells are annually sunk."

Major Mackenzie.—Ellichpur.—" Very few holders of land carry out improvements, such as digging wells, &c., it being asserted that on a revision of assessments such improvements would be overlooked, and the ryots charged with the higher or garden rates."

Major Szezepanski.—Wun.—" Hitherto it has only been rarely that holders of land have attempted to improve their land by digging wells and channels, but since the introduction of the new rules prescribed by the Resident under the provisions of the Land Improvement Act, there is more inclination to do so."

It is well known that a great many new wells have been made in the Akola District during the last ten years, but statistics on this point are not available.

In the Jalgaon Taluka, at the time of the settlement in 1865, there were 1,860 wells in excellent order. The area of the taluka is 419 square miles, which gives an average of more than four wells to every square mile.

It would appear from Major Mackenzie's reply that the conditions of the settlement are not properly understood in the Ellichpur District. Rule I. of the settlement rules, which refers to the point in question, runs thus:—

" With a view to the improvement of the country and people, the assessment now introduced by the Superintendent, Revenue Survey, has been fixed by Government for a period of 30 years, during which period the full benefit of every improvement, such as the conversion of dry into irrigated land, by the digging or repairing of wells or tanks, the planting of fruit trees, &c., will be secured to the incumbent of the land, and no extra assessment levied on that account. A revised assessment may be made at any time after the expiry of the present settlement. Such revised assessment shall be fixed, *not with reference to improvements made by the owners or occupants from private capital and resources during the currency of any settlement, but with reference to general considerations of the value of land whether as to soil or climate, prices of produce or facilities of communication.*"

The words in italics show that due provision has been made to secure hereafter to landholders the benefits of all improvements effected by the expenditure of their private capital, and my own experience in the Akola and Amraoti districts is, that these conditions are generally understood by the people.

I agree with Major Mackenzie in holding that one great reason why more improvements are not made is that cotton and jowari do not require irrigation. There is no inducement to landholders generally to convert their cotton fields into garden-lands. Garden produce requires much labour and attention, and *the demand for it is limited;* while, on the other hand, cotton is easily cultivated, and can be sold in the established markets on any day and to any extent.

In his report on the Mekhar district, Major Elphinstone mentions the following reason against irrigation in that district from the Penganga river:—

" The natives look upon this (the Penganga) as a holy river, and venerate it almost as much as they do its namesake the " holy Ganges," in Bengal. The idea of damming it up, or creating any works that could in any way interfere with its flow, seemed to them almost sacrilegious. There are many spots at which a small dam could be advantageously created, and but for some religious prejudices on the part of the natives, it would be difficult to account for their not having done so themselves. The expense would have been but trifling. At the town of Mekhar a dam could be easily thrown across this river, and a good deal of land brought under cultivation. Even at the end of January there was a good flow of water in the river.

Lieut.-Colonel Menzies.—Amraoti.—" Taccavi advances are rarely asked for, and the formalities to be gone through before they are obtained rather discourage applications for them. They are cheifly needed to improve the water supply, and the villagers prefer carrying out works badly, at a great waste of money, to permitting the employment of professional engineers. Schemes for works get so bandied about, that much time is lost and interest in them cools down,

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budget allotments lapse, and files of correspondence accumulate, while no results follow.”

Major Szczepanksi.—*Wun.*—“The people are deterred from availing themselves of advances under the Land Improvement Act; 1st, by the difficulty, owing to their impoverished condition, of furnishing securities; 2nd, by the intricate, tedious, and unintelligible procedure which has to be gone through before the advance can be obtained; 3rd, being indebted to and in the power of the sowcars, they are not allowed to become debtors elsewhere.”

Major Mackenzie.—*Ellichpur.*—“The object of the Act has been widely made known to the people, but the applications have been almost *nil.*”

Before the introduction of the Land Improvement Act we never gave any advances to the people, so that the Act has not in any way tended to narrow such transactions.

Another reason why Government advances are not more generally applied for is, I think, that agriculturists dislike, and are afraid of, the fixity of our rules for repayment by instalments. Instalments must be repaid on the specified dates, any failure to do so rendering the defaulter liable to be sold up. But in dealing with the Marwadi money-lender the agriculturist knows that a little more interest, a fresh bond, or a small payment to account, will enable him to tide over his difficulty for a time.

BOMBAY.

BOMBAY.

Mr. J. B. Peile.

The following is a summary of the opinions of the officers consulted :—

Kaira.—The holders in question dig wells, but attempt no other works. They believe in the security of their tenure, but are prevented from doing more by want of means. They have not sufficient energy or education to avail themselves of the advantages of the Land Improvement Acts. The demand for interest on Government advances is not obstructive or prohibitory.

Thana.—No special improvements under any tenure. Action is not impeded by insecurity of tenure. Some men of capital have lately invested it in reclaiming lands from the salt marshes. The Land Improvement Acts have not been taken advantage of. Tuccavi advances of small sums without interest are allowed only to certain wild tribes, but should be extended, as the cultivators are driven to the Saucar for small loans. The Land Improvement Acts are suitable for men of position, but the ordinary cultivator wants a small advance at nominal interest without trouble.

Khandesh.—Holders who are well off or energetic do improve their lands. Poverty rather than insecurity of tenure prevents cultivators from sinking wells and other improvements. The number of applications for loans under the Land Improvement Act is increasing. The conditions of the Act are not too stringent if the borrower is solvent and hard working. The interest is a little obstructive and might be reduced from 6¼ to 5 per cent.

Nassick.—The holders are alive to the benefits of irrigation, and dig wells yearly and feed irrigation channels by dams built by themselves. Their efforts are limited by poverty, not by the tenure, which is secure in all cases. The Land Improvement Acts have not been much used, owing to the number of formalities and difficulty about security. The interest is low compared to that charged by money-lenders, but the ryot dislikes the punctual repayment enforced.

Sholapur.—Wells are dug and fields banked and levelled. The tenure would be considered quite secure if there were a recognised limit to the increase of rent at the end of the settlements. Advances under the Land Improvement Act are increasing. The interest is not too high.

Kaladgi.—Holders of all kinds dig wells, make channels, and embank fields as their means permit. No holders are deterred by insecurity of tenure. The Land Improvement Act is seldom taken advantage of. The interest is not prohibitive, being below the current rate.

Canara.—The mulgars do little in the way of improvements, and their tenants no more. The Land Improvement Acts are not used. The interest is less than the current rate, but the punctual repayment deters, and the Saucar, who will wait, is preferred.

Satara.—Wells are dug and the people seem alive to their utility. There are very few canals. Where they exist, the people use their water freely. Where wells and channels are not dug, the cause is poverty rather than the insecurity of tenure, which is secure enough. The machinery of the Land Improvement Act is too intricate to be popular. The rate of interest is not prohibitory, but the nature of the security is obstructive. The Mamlutdar should personally inquire who want loans, and the security of the village officers should be accepted.

Ratnagiri.—Combined with peaceful times, the khoti tenure has certainly benefited the Concan. *Vast areas of culturable land have actually been made by the khotes or their tenants aided by them.* Hundreds of acres of salt swamps have been converted into valuable rice lands, and thousands more await capital. The Land Improvement Act has been hitherto inoperative in Ratnagiri. If it is not to remain a dead letter, the rules for granting loans under it must be considerably relaxed. The boon offered is surrounded by a fence of harassing, irksome, and tedious formalities. The prospect of having to pay an enhanced rent for improvements, does not deter the superior holder in this district.

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ol. W. C. nderson.

The holders of all lands in the Bombay Presidency are in the habit of digging wells for irrigation in all localities where it is practicable. Every day sees the digging of new wells going on. The tenure of land afforded by Bombay Act I. of 1865 affords the fullest security from additional taxation for all improvements on his own land effected at the ryot’s own cost, so long as he does not apply them to interference with the property of others or of Government. Regarding the working of the Land Improvement Act I have no personal experience. But I believe that the people recoil from the idea of involving themselves in money transactions with Government, which is no more than what I should expect.

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r. W. G Pedder.

Details regarding the working of the Land Improvement Act will, doubtless, be supplied by the Collectors. Speaking generally, I believe that Government advances are taken advantage of to a very small extent to effect improvements, and this certainly not on account of the rate of interest charged, which, compared with that commonly paid for similar loans to saucars, is almost nominal. It is very difficult to say why the people do not more largely avail themselves of the facilities Government offer for making permanent improvements on reasonable terms. Some officers think that this arises from fear of the landowner to offend the money-lenders by borrowing from Government; some from reluctance to place himself under an obligation to Government or its subordinate officers; some from a feeling, certainly common among the Hindu peasantry, which leads them to prefer, to much more favourable terms which they know they must fulfil punctually, far harder ones which they think there may be some chance of partially evading or of

BOMBAY.

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postponing the fulfilment of. All of these causes may have some influence, but I am disposed to think that a cause already referred to has most to do with it: that the people do not care to take the trouble and risk of making improvements for the benefit of their creditors.

With regard to the construction of irrigation wells (certainly valuable as a safeguard against famine, though not an absolute protection, wells being apt to fail when most wanted, and also as increasing the productive power of the land), a plan has often struck me which it might be worth while to try.

The dry-crop assessment of land in the Deccan suitable for well irrigation may be taken at about one rupee an acre. If irrigated by a well, it would certainly fetch on the average Rs. 8 an acre rent, and this is what a saucar who advances the money for a well calculates on at least getting. Now, a two-kos well will irrigate about 7 acres (on the average of crops wanting more or less water); and the rent due to the well, extra to assessment, is thus Rs. 49 a year, or 5 per cent. on Rs. 980. The cost of a well, of course, varies very much with the nature of the rock, the depth of water, &c. But I have usually found builders willing to take a contract for the construction of a two-kos well for Rs. 500 to Rs. 750. Taking the higher figure, it is evident that Government might construct wells and get 5 per cent. on the outlay, even allowing that 25 per cent. of the wells (a large proportion) turn out useless. Now, it seems to me that Government might very well construct a well for a peasant on his agreeing to pay the required rent in addition to his assessment, on the condition that he might at any time buy the well off Government at cost price, plus a per-centage to cover cost of failures. It would, of course, be necessary that he should execute a transfer of his land to Government on these terms, so as to bar the lien of any other creditor on it. I understand that this system has been tried with remarkable success in the Bhaunagar State; and it might be worth the while of the Commission to obtain details from Mr. Percival or from the Durbar.

SINDH.

SINDH.

Col. Haig.

Landholders in Sindh are, of course, constantly cutting new irrigational channels of the smaller class. Canals of any size are undertaken by Government only. Wells are constructed by private individuals to the number of about 90 annually on the average. The cost of constructing a well for irrigational purposes varies from Rs. 250 to Rs. 500. The area in which wells can be profitably made is limited, consisting of a strip of land bordering on the river. Here water is near the surface and abundant. Farther from the river the well has to be sunk deeper, and the water is, of course, less abundant, and is raised at greater expense. These facts, coupled with the question of capital, limit the construction of wells. The tenure being absolutely secure, and the entire returns arising from improvements effected at private expense being guaranteed to all landholders by law, there is every inducement to the agriculturist to invest capital in such improvements as wells and canals.

MADRAS.

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The Board of Revenue.

In Ganjam the ryots of either Government or Zemindari lands are not in the habit of carrying out any improvements beyond making shallow tanks by throwing dams across watercourses.

In Vizagapatam much activity is reported to have been shown of late by the ryots in Government taluks in sinking private wells, which are roughly dug at a smal cost, water being found near the surface; but owing to the insecurity of their tenure the ryots in Zemindari and Inam lands hesitate to sink their capital on agricultural improvements.

From the Kistna district it is reported that between 1871–72 and 1876–77 no less than 1,000 wells have been sunk by private capital by ryots holding direct from Government, but the Zemindari ryot is deterred by the insecurity of his tenure from carrying out material improvements himself.

In Nellore the ryots and the tenants of Zemindars are said to be in the habit of carrying out material improvements, such as the digging of wells; but subtenants are not.

The Collector of Cuddapah says:—"The holders of " the tenures directly under Government (that is, " Ryotwari, Inam, Shrotriem, and Jaghir) do make " material improvements to their lands by digging " wells and channels, &c., as their tenure is secure. " In cases of sub-tenures the reverse is the case."

In Kurnool numerous wells are reported to have been sunk, and the ryots are said to be in the habit of digging wells in their lands wherever possible.

In the same way, from North Arcot the Collector writes that the great mass of the Government ryots are poor and cannot afford to dig wells at their own expense; but well-to-do ryots are in the habit of improving their lands by constructing wells and small tanks. Ryots in the Kalahasti Zemindari seldom attempt to lay out capital on any permanent improvement of their holdings, their tenure being so precarious.

The Collector of South Arcot reports that the Tahsildars of the district estimates that Rs. 3,39,027 were spent between 1871–72 and 1876–77 by Government ryots in the improvement of their private sources of irrigation. He considers that the security of the tenure under Government induces many a poor, hardworking ryot to dig a well in his land. With regard to Zemindari and similar lands he reports that there is no information on record to show what outlay has been made on improvements.

With regard to Tanjore, the Collector reports that the chief estates are lands watered by the Cauvery, and therefore supposed by their owners not to require improvements at any great cost. He also remarks, apparently of the district generally:—"Most of the " ryots are poor, and barely get enough to live from " hand to mouth." The Board read with much surprise this statement regarding the wealthiest district of the Presidency; but as ryots in Tanjore are usually called Mirassidars, the explanation seems to be that the Collector is referring to the large class of labouring tenants, of whom he elsewhere writes:—"The ryot- " wari tenants are generally Poracudies, having no " occupancy right and cultivating on behalf of the " Mirassidars. They get from twenty-five to thirty " per cent. of the gross produce as waram."

In his reply to this question, the Collector of Trichinopoly deals with sub-tenures only, and remarks that tenants of Inam and Zemindari lands scarcely ever improve their land, as they are not permitted to enjoy the benefit of such improvement without their assessment being raised.

The Collector of Madura states: "The holders of " land in this district make improvements whenever " they have money to spare, but unfortunately such " cases are very few. The tenures prevailing in the " district are not obstructive to such investments, but " poverty is in their way." The Sub-Collector says: "The holders under proprietary tenures are constantly " extending wells in all directions. We have no " canals, but where channel irrigation is possible, such " holders are only too active to take advantage of it, " whether with or without regard to others' rights.

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IAP. I. QN. 11.

MADRAS.

'he Board of Revenue.

" Security of tenure is the great affecting cause, for " a man will expend his whole capital to provide " himself with a well in ryotwari or otherwise secure " land." He also considers the want of a proper method of examining for springs to be a great obstacle in the way of well-sinking, causing much loss of money and many disheartening failures.

The only improvement ever carried out in Coimbatore is the digging of wells. The district being chiefly ryotwari, there is no insecurity of tenure, but poverty stands in the way, as more than half the ryots pay less than Rs. 10 annual assessment, and are probably in debt far beyond the value of their lands. As many as 1330 new wells were dug, however, between 1871–72 and 1876–77 without advances under the Land Improvement Act.

The Collector of South Canara considers that in that district, with its copious and regular rain-fall, there is no scope for improvements of land on an extensive scale; proprietors and mulgeni tenants, however, carry out material improvement within the limits of their own resources, loans being seldom contracted for the purpose. More would be done if the farm-stock could be improved by the introduction of a superior breed of cattle.

The Collector of Malabar states that not much money is laid out on improvements " owing partly to " ignorance and partly to the habit of the majority of " the proprietors of rack-renting their tenants and " rejecting them without sufficient cause. In conse- " quence of the insecurity of the tenure and the in- " adequacy of the rates allowed for improvements, " arising from the present state of things, the mort- " gagee finds it his interest to get out of the landholder " during the time of his lease as much as he can, " giving back to it in the shape of manure, &c., as " little as possible."

From the above it is clear that, as might have been expected, insecurity of tenure forms an almost absolute bar to improvement, though the Collectors of Vizagapatam and Nellore report that in Zemindaris in which tanks are neglected, the ryots are driven to supplement their ruined irrigation works with wells. The extent to which insecurity of tenure prevails is indicated in the reply to the preceding question. With regard to Government ryots and others whose tenure is secure, poverty is frequently reported as limiting improvement. This is, of course, true; a man cannot carry out improvements when he has not the means to do so, but it would be a mistake to infer from this that improvements in any way keep pace with means. The contrary seems rather to be the case. Neither in the replies to this question, nor in those to question 4 is there any testimony to a desire to effect improvements being a characteristic of the Zemindars and large proprietors, and in the list given below of districts in which there are a large number of private wells in Government and Inam holdings, it will be observed that the per-centage of holdings with an assessment of less than Rs. 10 to total holdings, is almost invariably above the average for the Presidency, viz., 64·29; in other words, wells are most abundant where small holdings are most common:—

	Number of private Wells.	Per-centage of small Holdings.
North Arcot - - -	52,490	73·63
South Arcot - - -	51,468	66·79
Coimbatore - - -	47,591	70·94
Salem - - - -	33,237	73·61
Tinnevelly - - -	28,429	62·64
Cuddapah - - -	27,538	70·73
Madura - - - -	24,174	72·97

Of course the number of wells is primarily due to the low average rain-fall and other climatic conditions, and not to the number of small holdings; but the table is instructive, as tending to show that there is truth in the general impression, that the average South Indian cultivator will give both money and labour even under adverse circumstances, when he finds it absolutely necessary to do so to gain a livelihood, but not otherwise.

Prior to the recent famine the effect of the Land Improvement Act may be said to have been practically nil. During the famine the following advances were made under the Land Improvement Act of 1871:—

	Ordinary. Rs.	Famine. Rs.
1876–77 - -	4,435	44,538
1877–78 - -	1,56,367	13,67,520
Total -	1,60,802	14,12,058

But the Board have no doubt that it is desirable that the operation of the Land Improvement Act should be facilitated as much as possible, but the rules under which advances are to be made have recently been revised after much consideration, and until they have had a fair trial, the Board are not prepared to submit any further proposals for facilitating the working of the Act or enlarging its scope.

The interest charged on advance under the Land Improvement Act is 6¼ per cent., and compares so favourably with the ordinary market-rate of interest on transactions of the kind that the Board have no hesitation in stating that no ryot otherwise desirous of obtaining an advance would be deterred by a consideration of the rate of interest charged.

MYSORE.

MYSORE.

r. Ricketts.

As a broad rule landholders are not in the habit of carrying out material improvements, though in the natural course of prosperity many wells have been dug here and there. Under the native rule there were no inducements to sink wells, and the watered land was charged with water-rate, which often worked a hardship, for though the wells might subsequently have fallen or otherwise got into disuse, it was most difficult for the owner to get his land again charged as dry. It was only after the advent of Mr. Bowring, that special, or rather it should be said the usual concessions were made in the case of new wells. The survey and settlement have, however, put all this on a proper footing, and wells and the natural result, gardens, are springing up in many directions in settled taluks.

Mr. Bowring further offered inducements to private capitalists to expend money on the repairs of ruined or disused tanks. Apparently the scheme prospered at first, but it has terminated in failure owing to the glaring manner, in some cases, in which the holders tried to evade their responsibilities. In fact, though monied men, the wrong class took up the tanks. The ryots themselves held back. They were fearful of incurring heavy obligations to the Sarkar and were content to let the Sarkar take the initiative and share profits with them.

I am not in favour of making advances under the Land Improvement Act, *i.e.*, as a rule. Those that go in for improvements with borrowed money are generally of a sanguine or flighty nature, and are likely, as not, to throw up in disgust or despair even when success by perseverance and skill is almost within reach. Easily-gotten money is easily spent. The character of Indian agriculture with its cheap prices of produce is such that profits can only be made by the skilful and industrious. The maturing of these qualities will generally end in seeing the possessor with quite enough wherewith to enlarge his operations. Thus progress is gradual and healthy. The sons begin where their fathers left off, and there is none of that inherited wealth which proves oftener

Chap. I. Qn. I
Mysore.
Mr. Ricketts.

a curse than a blessing. I would not, of course, check improvement, for I see improvement all around me, but I would not artificially aid it. The ryots' wants are simple, and he is sufficiently happy, which after all is the great desideratum. Gradually his wants go on increasing, and his efforts in improved agriculture, industry, &c. must go on increasing in the like proportion. This result, though gradual, is general; not so the ephemeral acquisition of wealth, when the son generally ends where the father ended, and it is a question whether the acquired wealth will make the possessor happy or not.

Mr. Krishniengar.

The tenures of land in this district are:—

I. Kandayam, under which fixed assessment is paid in money to the Government, whether the land is cultivated or not, the assessment being subject to revision.

II. Batai, under which the Government gets a share in the produce instead of money assessment, only when the land is cultivated.

III. Kayamgutta, under which whole villages are rented out on a fixed lease, not subject to any revision.

IV. Jodi, or grants of whole villages or lands with partial remission of Government demand, not subject to revision; and,

V. Survamoniyam, or grants of villages or lands entirely free from rent.

Number 1 is the main tenure on which lands are commonly held everywhere in this country.

Number 2 now prevails only in unsurveyed and unsettled taluks, and this too with regard to irrigated lands alone.

Number 3 exists to some extent in a portion of the Province; and

Numbers 4 and 5 are to be found in every part of it to a less or more extent. With the exception of lands held under tenure number 2, and those falling under tenures numbers 4 and 5, for which no special alienation is given in the title deed, all others are transferable.

Up to the year 1863 the occupants of lands held under tenure number 1 were to a great extent hindered from carrying out any material improvement to their lands by digging wells or channels, as they had up to that time to pay enhanced assessment when they raised irrigated crops, though at their own outlay. The rates of assessment levied on lands irrigated by such private wells were so many as 68, the maximum being Rs. 23 per acre. This was found to be so ruinous to the ryots that Mr. Bowring, after making a tour in my district, authorised me to reduce the number of rates to five, and limit the maximum rate of assessment to Rs. 10 per acre. This has relieved the ryots to a great extent, but I would yet make further reductions, as I find that the income does not still bear a fair proportion to the outlay, and consequently the ryots are driven to contract debts for the purchase of bullocks, which they have so often to change when employed in lifting water from deep wells. Since Mr. Bowring's order of 1863, which allowed the ryots to sink wells freely in their holdings and enjoy the full benefit of their labour and outlay without extra impost on that account, 967 wells have been sunk in my district, but considering the large extent of lands where wells could be dug yet remaining without them, I think the number is too small, and this I attribute partly to the revision of assessment to which these Kandayam lands are subject after the expiration of the guaranteed term, and partly to the poverty of the people. It therefore appears to be desirable to give further encouragement to the ryots to sink wells in their holdings, and this can only be done by removing the present popular impression, that after the expiration of the term guaranteed by the Survey Department additional tax would be imposed according to the condition in which the land will be found at the time, without reference to the expense incurred in its improvement, and by providing sufficient money annually for making advances to the poor ryots under the Land Improvement Act. Although this Act has been extended to Mysore only two months ago, and I am therefore unable to say now what have been the effects of it, I have not the least doubt of its proving a great boon to the country. The provisions of the Act are, in my opinion, liberal enough in every respect, and I am sure that the benefit of it will be freely availed of by the poor ryots, as the person seeking the advance can obtain it on the security of his own land, when it is sufficient; the interest charged by the Government is very much lighter than that demanded by the Saucars, and the instalments are easy. The Act may therefore stand as it is. I would, however, adopt every measure to encourage the people of the country to spend their own capital on the improvement of their holdings without looking to Government help, and in view to this great discretion should be exercised in making advances under this Act. Much encouragement might be given to the ryots in this respect by doing away with the distinction of "Baghayat" or garden rate, which is higher than the other two rates, viz., dry and wet. Either the dry or wet land may be converted into garden, but it cannot always continue to be so. It depends more upon outlay and labour than upon soil, and what was once a garden may cease to be so when the holder is unable to bear the extra cost and labour required for the purpose. It is only just that those who spend extra money and labour should be allowed to reap the extra benefit, and I would therefore only have two distinctions, namely, dry and wet, and assess the lands according to the quality of the soil and the quantity of water supplied, without reference to the crops raised, whether paddy, ragi, sugarcane, cocoa, or areca nut, &c.

The improvement of land has been checked to a great extent by the orders issued by the Local Government in 1871, modifying those passed by Mr. Bowring in 1863. Copies of those orders are appended to this report. The extent to which the improvement of land is hindered by the order of 1871 which is now in force, can be observed from the fact that between 1864 and 1871, 562 petty ruined tanks were repaired by ryots and others of the country wholly at their own cost, amounting in round figures to Rs. 2,40,000, adding an annual revenue of 14,200 rupees to rupees 3,000 previously derived from lands below them, and 870 wells were sunk; while since 1871 no more than six ruined tanks were taken up by the ryots, and only 97 wells sunk; and this is, in my opinion, undoubtedly due to the restrictions laid down in the order of 1871. It may also be observed here that out of the 568 tanks thus repaired by private enterprise in my district, 90, which were either breached by accident or only partially repaired, have been resigned, the owners being unwilling to incur any further expenditure in consequence of the Irrigation Department having breached or otherwise rendered useless some of these tanks in carrying out the serial system introduced in this country in the year 1872.

HAP. I. QN.11.

UENTRAL INDIA.

Mr. Wingate.

CENTRAL INDIA.

Bhopal.—Cultivators who break up new land are exempted from rent for three years.

Rutlam.—"Every holder of the above tenure is "at full liberty to make any improvements within his "own holding, such as digging a well, damming a "nullah, or providing any other source of irrigation. "He is entitled to enjoy the full out-turn of his field "beyond the settled jamma. Moreover he has the "assurance of being allowed rent free one-fifth of his "improved land in perpetuity after the expiry of the "existing term and the renewal of the lease. As an "encouragement to increase the means of irrigation, "every 'Asamee' is privileged to borrow from the "State treasury a sum without interest for digging "a well, and to repay the same by easy instalments. "This system has led to many new wells being dug "through the district, and the result is favourable "both to the State and to the cultivator."—*Mir Shahamat Ali, C.S.I.*

Manpur.—"The Land Improvement Act is not in "force in Manpore. On the contrary, the terms of "the settlement in the settled villages debar the "making of any advances to the cultivators. An "annual grant of Rs. 1,700 has been passed in the "Pargannah budget by Government for some years, "to be spent in sinking and improving Government "wells in the pargannah, and additional water rates "are paid by the cultivators of settled villages on "fields irrigated by them from such newly-made "wells."—*Pundit Suroop Narain.*

HYDERABAD.

Ioulvie Mahdi Ali.

HYDERABAD.

1. Are the holders of the above tenures in the habit of carrying out material improvements, such as digging wells, or channels necessary in order to use the water in a canal?

Yes, they are, and specially so during the last four years, because of Government having directed that every encouragement should be afforded to the cultivators to sink wells in their holdings, and that if any cultivator offered to construct a well, the Talukdar should grant him a written *kaul* to the effect that Government would not levy any water rate for irrigating his fields for a period of 30 years. During the years 1285–86 no less than 2,389 wells were constructed, and 570 were under construction.

2. Are their actions in this respect affected most by the security of their tenure, or by their wealth or poverty?

Hitherto it may be said to have been effected mostly by the insecurity of their tenure, as is proved by the fact of their constructing nearly 3,000 new wells during the four years that encouragement has been offered to them to construct them. In times past the cultivators never appear to have constructed as many wells in so short a period.

IAP. I. QN. 12.

CHAPTER I.—QUESTION 12.

How far is the landowner's or the cultivator's readiness to improve the land checked by any operation of the law? Is the digging of wells checked in any such way? How far does the expectation of having to pay increased revenue or rent in consequence of any improvement check the execution of improvements?

PUNJAB.

Mr. Gore Ouseley.

PUNJAB.

I am not aware of anything in the state of the law which unduly checks an owner's or occupancy tenant's readiness to effect material improvements on his land. The digging of wells is certainly not checked by any existing law. As to how far the expectation of having to pay increased revenue or rent in consequence of effecting improvements may check the execution of those improvements, this depends on a variety of circumstances, such as the original cost, the length of time the settlement or lease has to run, the probable annual profit, the disposition of the individual owner or tenant, his age, circumstances, &c., &c.

'ol. Davies.

I am not aware that there is any provision of the law which checks improvements. The Punjab Tenancy Act sufficiently protects the rights respectively of the landlord and of the tenant. But ignorance of the provisions of the law in the case of the latter undoubtedly has the effect of checking improvements, for tenants with rights of occupancy are not as a rule aware that they have any right to make permanent improvements, and the prevailing idea is that a person of this class who sinks a well thereby acquires a proprietary right in the land in his occupancy, or in so much of it as is irrigable by the well, and proprietors therefore will not permit their tenants to make such improvements. The best way to remove this ignorance would be to embody the provision of the law on the subject in the administration paper of villages, but unfortunately we are forbidden to enter in these papers any matter expressly provided for by law.

In the case of proprietors there can be no doubt that the fear of having to pay an enhanced assessment (notwithstanding the promulgation of the rules relating to pattas) operates in checking improvements towards the close of the period for which a settlement has been made. But this cannot be said to have any permanent effect in restraining the investment of capital in improvements. The case of tenants is different; besides ignorance of their rights, there is always before them the knowledge that they may have to pay a higher rent if they sink a well or otherwise increase the productive capacity of their land, and this knowledge must have the effect of permanently checking any disposition on their part to lay out money in improvements.

ORTH-WESTERN PROVINCES AND OUDH.—*See under Question* 11.

BENGAL.

CHAP. I, QN. 1

BENGAL.

Mr. Toynbee

As regards landowners and tenure holders as distinguished from actual cultivators, all their rights are secured to them by law, and the demand of Government revenue is fixed and unalterable. There is nothing, therefore, in the state of the law to prevent their making such improvements on their estates as they consider feasible. But, as a class, they are too many of them merely rent collectors, taking no interest in the material welfare of their lands, or in the prosperity of those who cultivate them. They look no further than to exact the uttermost farthing from those who till the soil. If they dig wells, as they do in Behar, it is that the rent of the lands watered from them may be increased.

The insecurity of the cultivator's tenure, his poverty, and the fear of enhancement together, may prevent him from digging wells and making improvements where they are feasible, but where it has been the custom from time immemorial to resort to artificial irrigation, he will contrive to do so. But of the great body of the ryots of the country, except in Eastern Bengal, it may be said that they have no ambition, no wish to improve their lands, or to do more than to live as their forefathers lived before them. Nothing short of force could stir their apathetic nature to move out of the established groove in which agriculture runs.

CENTRAL PROVINCES.—*See under Question* 11.

BOMBAY.

BOMBAY.

Mr. Peile.

The opinions of the officers consulted on this question are epitomised below :—

Kaira.—There is nothing in the law to check improvements. The conditions of proprietary tenures are all fixed and their liabilities settled by legislation. Those of the survey tenure and the 30 years' settlement do not act as a check. Towards the end of the term of settlement they may temporarily.

Thana.—No provision of the law checks improvements. But a landlord is checked by the rule that if he charge an increased rent as interest on improvements, he cannot get the assistance of the revenue authority* to recover the increment above the survey assessment, and must go to the Court.

Kaladgi.—No such operation of the law is known. Possibly the expectation of a revision at the end of a term of settlement may temporarily deter from improvements.

Dharwar.—The strict provisions regarding loans under the Land Improvement Act check improvements by means of advances. The approach of a revision defers improvements temporarily.

The digging of wells is in no way checked by law. The people are now well aware that they will not be required to pay increased assessment on account of improvements. So far as newly sunk wells were concerned, this point was not definitely settled till some 10 years ago. Notwithstanding, and though before that the people had no reason to expect that they would be exempt from additional assessment on revision, well sinking went on actively. The very low rate of extra assesments on well irrigated land above that on unirrigated land fixed at the first settlement, compared with that commonly before in force, induced the people to have no fear of what might occur on revision at the expiration of the current settlement, up to which time they had an express guarantee of no increase of assessment.

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* Nairne's Handbook, p. 177.

MADRAS.

MADRAS.

The Board
Revenue.

From the replies to questions 10 and 11 it will have been seen that the uncertainty of the legal position of a Zemindari ryot tends to check the execution of improvements, as does also his liability to have his rent enhanced by his landlord for improvements carried out by means of private outlay.

In the case of a Government ryot there is no insecurity of tenure tending to check the execution of improvements, nor is there any law in force in the Madras Presidency having any such effect. The most distinct assurances have been given to Government ryots that the tax on lands cultivated by means of wells constructed at their own cost will never be enhanced, unless on a general revision of the district rates ; and that in such revision any modification in the assessment of lands so improved will be irrespective of the increased value conferred upon them by their holders.

It has hitherto been considered equitable to charge a water-rate when a well has been sunk on irrigated land or within 10 yards of a tank, river, or channel on unirrigated land; but the Government have lately directed that even these are to be treated like other private wells, and the constructor given the full benefit of his improvement.

MYSORE.

MYSORE.

Mr.
Meiklejoh

Tumkur.—Four of the taluks in this district have been surveyed and settled, and in the others survey operations are being rapidly completed. By the Mysore Government Guarantee, for 30 years after the settlement, dry crop land which may be converted into wet crops solely at the cost of occupiers or cultivators will not be subjected to any extra assessment whatever, nor will any extra tax or cess be imposed on account of fruit or other trees planted hereafter by occupiers or cultivators on account of superior crops being grown. If a well is dug by the cultivator, or a watercourse (*kálvé*) made from a stream, the water of which is not the produce of a work constructed at the expense of Government, no additional assessment will be imposed again.

RAJPUTANA.

RAJPUTAN

Mr. L. S.
Saunders.

Ajmir.—There is a premium on the digging of new wells. A man who digs a new well can get a *pottah* from the district officer, which will protect his land from increase of assessment at *next* settlement, and for the term of that *next* settlement.

HAP. I. QN. 12.

CENTRAL INDIA.

Mr. Wingate.

CENTRAL INDIA.

Bhopal.—The payment of increased revenue prospectively does not discourage wells and tanks, the leases being always for long periods.

Rutlam.—" During the term of the lease every landholder is entitled to enjoy the full income of his improvements. In this case no expectation of having to pay increased rent in consequence of any improvement will check the execution of improvements, because before the expiry of the lease the owner is much more than repaid for any expenses he may have incurred on this account; or if the lease for digging a well is taken from the outset, he will enjoy a reduction of one-third or one-fifth of the revenue, as may be the condition, in perpetuity."—*Mir Shahamat Ali.*

CHAP. I. QN. 13.

CHAPTER I.—QUESTION 13.

What is the general incidence of land revenue on the cultivated area, both for the arable land as a whole and for the different classes of such land (irrigated, dry, &c.)? What proportion does such revenue bear to the value of the gross produce? Is the incidence on the various classes of land fairly distributed, or would you propose any re-adjustment of it? When was the assessment fixed? Has there been any practical difficulty in realizing the land revenue as now assessed? At what dates are the instalments of revenue payable, and what relation do these bear to the ordinary periods of harvest or of realization of rents, as the case may be? Do the several instalments bear a fair proportion to the value of the several harvests from which the revenue or rent has to be made good? What rate of interest, if any, is charged on land revenue in arrear?

PUNJAB.

Major Wace.

PUNJAB.

What is the general incidence of land revenue on the cultivated area, both for the arable land as a whole and for the different classes of such land (irrigated, dry, &c.)? What proportion does such revenue bear to the value of the gross produce?

In a country such as the Punjab, the major portion of which passed from native to British rule only 30 years ago, the incidence of the land revenue can be stated from three different points of view,—its present incidence as compared with the revenue levied before British rule, the actual cash rates per acre now levied, and the share of the produce which they may be assumed to absorb. Of these three methods of viewing the subject, the first is probably the one entitled to most weight; it is certainly the point of view from which the subject must most commonly be regarded by the agriculturists themselves; and it will readily be admitted that the relation of the State's present demand from the land to the standard sanctioned by the immemorial usage of the country up to British annexation is of at least equal importance to that of its actual present incidence viewed by itself.

On the question of the incidence of the land revenue under the Native Governments, the best testimony is that of those officers who controlled the Sikh Government from 1846 to 1848, during the three last years of its existence. Similarly we can refer to the testimony of those officers, to whose lot it fell in the first years of our administration in the Punjab to reduce the standard of the Sikh Government to such a demand, as they judged necessary for the prosperity of the agricultural classes.

Of such testimony selections are appended to this reply. It is impossible to read these selections and to doubt the substantial accuracy of the following statement, which I quote from the Punjab Administration Report for 1875–76:—

" The Sikh system of assessment was that the State as proprietor-in-chief took all that it could get, and it did take often as much as one-half the gross produce of an estate, besides a multitude of cesses under the names of rasúm, nazráná, &c., and exorbitant fines on succession."

Looking at the evidence before us, it is safe to assert that the Sikh land revenue collections were usually not less than from two-fifths to one-third of the gross produce, independently of the irregular cesses just referred to.

The usual method by which the land revenue was brought into the State's coffers was by lease of large tracts to local governors, or small tracts and villages to local headmen or petty farmers. These men were virtually renters, not collectors. The principle they followed was to collect as much and pay as little as possible. In a bad year they would collect not less than the amount of their lease, and in a good year much more. Thus, though much less than the value of what the agriculturists paid reached the Government's chest, the local managers and farmers took the full value of that share, and a practically unlimited number of additional exactions. I need not here repeat the details contained in the papers appended. But as we read the accounts of such a system written by those who were eye-witnesses of it, we can scarcely understand how the people tolerated it.

The object of our summary settlement was, 1st, to fix the amount of the State's demand; 2ndly, to define the quota thereof payable by each contributor; and 3rdly, to give a small immediate relief in its amount—a relief which was required by the severity of the previous collections and by the depressed state of the country, consequent on misrule.

The object of the first regular settlements was of a similar character. But made as they were some five or six years after the previous ones, our officers possessed a better experience of the amount of revenue that could be demanded consistently with the prospects of each tract. Reductions of 20 and 30 per cent. on the last Sikh collections, and even on our summary settlement, were commonly found to be necessary; a state of affairs which it is now-a-days difficult to conceive. It is true that the instructions under which our revenue officers worked, impressed on them the necessity of moderate assessments, and that the accepted theories required them to make all assessments not exceeding two-thirds of the net assets or rent. But their reports show that there then existed no means of applying such a standard; that, difficult as it now is to ascertain the average produce of land, it was then far more difficult; and that practically their assessments depended on their personal judgment of what it was fair and wise to demand, a judgment mainly based on the collections of the years preceding the settlement. There is seldom any indication in the reports that revenue reductions were lightly given, but complaints that they had been delayed too long were not uncommon.

During the last 20 years other influences have operated to lighten the incidence of the revenue; viz., higher prices and well established increase in cultivation and irrigation. It is believed that on the revised settlements the new assessments usually fairly appreciate increased irrigation; though a serious shortcoming in this respect undoubtedly took place in the re-assessment of the Amritsar and Lahore Divisions between 1862 and 1868. It is more difficult to make the assessments follow increased cultivation. The system of assessment, unlike that of Southern India where each field is separately leased, gives a lease to each village; which lease usually covers all the village land, cultivated and uncultivated. Large increases of cultivation occur during the currency of the lease; and experience shows that at the lease's expiry much caution is required in increasing the State's demand proportionately. Subject to such caution the increase of the land revenue demand proportionately to the increase in cultivation is insisted on at the expiry of each lease; but the value of the increased cultivation, consisting as it not uncommonly does of the poorer soils, is usually less than the ratio it bears to the old; and it would consequently usually be wrong to argue that a revised assessment is lighter than the preceding one, merely because the average rate of its incidence on the whole cultivation is lighter. The influence of prices is in their present unsettled state still more difficult to follow. I have given an account of this subject in my reply to question 16, which it is not necessary here to repeat. But it is pertinent to point out that the position of a revenue officer charged with fixing the revenue lease of a village for a term of years is wholly different from that of his successor, who towards the close of that term will perhaps inquire what proportion of the produce the lease has actually absorbed. It is impossible to make a cash assessment of the revenue, except on the basis of prices which have usually prevailed in past years; but owing to the steady and continued rise in values which has prevailed for 20 years past, the actual value of the produce has nearly always been greater than was assumed as the basis of our assessments.

It is only by bearing in mind these considerations that we can understand the great difference which now exists between the share of the produce which the Punjab agriculturist paid to the State, or rather to the State's farmer up to 1846, and that which he now pays to the British Government. Commencing in 1849 with a standard of one-third of the produce, a period of low prices, combined with other considerations affecting the welfare of a newly-conquered and previously much-oppressed country, compelled us to reduce that standard successively to a fourth and a sixth; and after having done this from the year 1860, a period of high prices has set in under which undoubtedly our assessments absorb very much less than the standard share of the produce on which they were framed.*

The standard share, which was aimed at in the settlement of each district, so far as it can be given, will be found in the appended statements of the average incidence of the revenue in each district. But in estimating its value and its meaning some additional data need to be borne in mind, over and above those already stated.

The preamble to the Punjab Land Revenue Act (33 of 1871) asserts that "the Government is by "law entitled to a proportion of the produce of the "land of the Punjab to be from time to time fixed "by itself." Arbitrary as such an assertion may sound, it is a strictly correct historical statement, as this reply and the papers appended abundantly show. Nor was it inserted in the Act on theoretical grounds; it merely stated the case as we found it at annexation and as the people continue to regard it. But when a revenue officer speaks of the State's demand as being equivalent to a certain share of the produce, the statement is slightly misleading, harmlessly and imperceptibly perhaps to himself, but materially so to economists and to persons unacquainted with the country. In the depressed condition of the country which preceded our rule, little of the produce of land had any marketable value, except grain and butter. This remark does not apply of course to market garden cultivation near towns, nor to such crops as sugarcane, cotton, spices, and the like. But the great mass of the cultivation in a depressed condition of the country is confined to cereals; and nine-tenths (or more) of the marketable produce consists of their grain, wood, grass, straw, milk and other items which add much to the rent of the land in more prosperous conditions of agriculture have no marketable value. It is of the yield of grain that both our former and present officers for the most part speak, when they describe the State's demand as a given share of the produce.

The complete predominance of cereals in the agriculture of the country remains to this day; but the tracts are now few and exceptional in which their grain is the only marketable product; straw, fodder, and butter have now usually a well-established value; and the number of petty items which contribute to an agriculturist's income is increasing. Whatever may be the abstract claim of the State to share in such new sources of profit, and however much our assessing officers may desire to see that a State more moderate than any of its predecessors succeeds in realising the full standard so moderately fixed, in practice it is very difficult to make our assessments keep pace with prosperity of this nature. There are no competitive rents, which might bring to account such accretions to the annual value of land; our assessments are in the form of long leases, and deal directly with petty proprietors cultivating their own lands; and the customary system whereby the State's demand is based on a stated share of the produce does not lend itself easily to the extension of that demand to items of produce not previously reckoned. I do not urge that we are in any way bound to yield the State's claim to share in all marketable produce; I merely assert from personal experience that it is practically difficult to make the assessments follow such new sources of profit; and that, as the agricultural prosperity of the country rises, there is in fact a practical increasing divergence between on the one hand the share of the produce which the State claims and which its officers endeavour to levy by their cash assessments, and on the other hand the proportion which those assessments really bear to the whole value of the produce.

If I have succeeded in describing intelligibly these influences, the reader will not be entirely unprepared for the conclusions arrived at by Mr. T. H. Thornton in an interesting paper appended to this reply (though not prepared in connection with the inquiries of the famine commission), as to the real value of the agricultural produce of the Punjab, the profits of the cultivator and the share absorbed by our land revenue assessments. He finds that the land revenue is one-sixth of the profits, and one-sixteenth of the gross produce of the whole Province.

Such an assertion, when compared with the efforts of our settlement officers to assess a revenue which shall nearly represent one-sixth of the produce in all the more fertile districts of the province, undoubtedly opens a considerable field for discussion. But if all the influences which I have above described be duly weighed, especially the effect of increased cultivation and of rising prices towards lightening the incidence of leases fixed for 20 or 30 years, we shall find reason to admit that the assessment in most years probably now absorbs only one-tenth of the whole produce of the land which pays it (the term produce being understood in its fullest sense).

To proceed to the question of the incidence of the revenue expressed in money, a statement appended shows the average incidence in each district reckoned on the whole cultivated area; and three other statements show the rates paid by irrigated lands in each district, by moist alluvial lands, and by the ordinary dry lands dependent on rain. These rates are so various, that an attempt to summarise them in narrative form would be of questionable utility.

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* The Financial Commissioner desires to observe that though the Lahore and Amritsur Divisions and one or two other districts were assessed between 1860 and 1872 on a standard of $\frac{1}{6}$ produce, the standard now observed (*e.g.*, in the late assessments of the Mooltan, Derajat and Delhi divisions and Jhelum districts) is $\frac{1}{2}$ assets, *i.e.*, $\frac{1}{2}$ the customary rents, which as a matter of fact are usually produce rents.

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'or Wace.

The question how far the incidence of the revenue varies from year to year is one of great difficulty. There are no data from which such a question could be answered. But whenever the annual variation in the area of cultivation, or in the area of irrigation are such as to cause great variations in the incidence of the assessment, it is the accepted policy of Government to modify the ordinary fixed character of its settlements. Thus on the Bári Doáb Canal irrigated revenue is levied not by fixed lump assessments on each village, but by acreage rates on the area actually irrigated each year. The same system is in force on the Upper Sutlej irrigation canals in the Lahore and Montgomery Districts. In the inundation canals of the Mooltan division and Dera Gházi Khan district, though the revenue payable by each village is assessed at a fixed amount, the assessment books show how much of this is charged for canal irrigation; and that share is not leviable in any year in which the irrigation has failed. In the same way in the Mooltan, Muzaffargarh, Dera Ismail Khan, and Bannu districts, where the annual variations of cultivation in the riverain lands situate in and on the banks of the Sutlej, Chenab, and Indus rivers are of a serious character, the assessment payable by each village for such lands is not fixed, but is charged at the settlement acreage rates on the area actually cultivated each year. The same system is also applied to the cultivation of the Dera Ismail Khan district, which depends on the capricious and uncertain torrents that run down from the Sulaiman Range. These fluctuating assessments have been in force about 10 years on the Bári Doáb Canal, and five on the Upper Sutlej Canals. In the other instances they have only lately been introduced.

It only remains to notice one point connected with the incidence of the land revenue, which has often provoked remark. It frequently occurs that heavier rates are paid by the more industrious villages and lighter rates by their less skilful neighbours occupying lands of similar natural advantages. It is practically impossible to adjust inequalities of this nature; and it is politically inexpedient to attempt to do so. The more skilful agriculturists pay the higher rates with more ease than their less able neighbours pay the lower rates; and also after paying the higher rates have a much larger margin of profit left to them. The less skilful agriculturists on the other hand are absolutely unable to pay the higher rates. In dealing with these matters it is impossible to be guided solely by theories of equality of assessment. When differences of this nature are inquired into, they are found to have their origin in the different antecedent circumstances of each class, and not to be merely due to present differences of agricultural skill. So long as the more industrious class is treated with real moderation, they have no just claim to hold their land at rents far lighter than any ever before paid by them. On the other hand, agriculturists, from whom our predecessors have uniformly levied comparatively low rates, have a substantial ground of objection against the enhancement of old established standards of rent merely on theoretical grounds. Every man's right in the soil, and no less that of the State, is to be decided primarily by what he has in fact enjoyed during past years. Any attempt to ignore this principle in our assessments in favour of theoretical equality would not only be financially injurious, but it would be distinctly opposed to the common feeling of the country, which is built up on and permeated by class distinctions to a degree unsurpassed in any other.

AVERAGE INCIDENCE of the LAND REVENUE ASSESSMENT in the PUNJAB per acre cultivated.

[*Note.*—Column 7 of this Statement is copied from Statement No. 8, appended to the Punjab Administration Report for 1876–77.]

Division.	District.	Average rain-fall per annum in inches.		Per cent. of cultivation irrigated.	Land Revenue demand for 1877–78, including fluctuating items.	Average incidence of land revenue per acre cultivated.	Share of the Gross Produce which the Assessment, when made, was intended to cover, so far as can be stated.
		Of recording station, with highest average.	Of recording station, with lowest average.				
Delhi - -	Delhi - -	30·6	25·5	37	8,89,461	1 12 3	} $\frac{1}{6}$.
	Gurgaon - -	33·6	28·6	19	11,99,255	1 2 3	
	Karnal - -	30·4	18·0	39	6,78,695	1 4 9	Not stated.
Hissar - - -	Hissar - - -	17·1	14·7	5	4,24,158	0 4 9	Do.
	Rohtak - -	20·2	18·8	13	8,83,291	0 15 10	$\frac{1}{6}$.
	Sirsa - - -	14·3	12·7	3	1,79,297	0 3 1	Not stated.
Umballa - -	Umballa - -	43·6	25·5	18	7,79,413	1 6 5	Do.
	Ludhiána - -	25·3	24·0	17	7,91,331	1 5 3	Do.
	Simla - - -	72·6	65·1	6	14,705	1 9 6	
Jullundur - - -	Jullundur - -	29·8	25·5	33	12,18,040	1 15 3	} $\frac{1}{4}$.
	Hoshiárpur - -	37·9	33·7	17	12,98,802	1 12 7	
	Kăngra - -	125·6	40·1	27	6,14,567	1 5 3	Not stated.
Amritsar - -	Amritsar - -	24·9	23·1	39	8,35,762	1 5 1	} $\frac{1}{6}$.
	Siálkot - -	39·0	24·2	50	11,09,873	1 6 10	
	Gurdáspur - -	54·1	27·0	16	10,77,221	1 7 9	
Lahore - -	Lahore - -	21·8	18·5	37*	5,94,693	0 9 7	
	Ferozepore - -	26·6	13·3	14	5,06,096	0 8 3	Not stated.
	Gujránwála - -	26·3	20·3	70	4,63,661	1 1 3	$\frac{1}{6}$.
Rawalpindi - -	Ráwalpindi - -	62·0	31·5	2	6,89,029	0 12 0	Not stated, perhaps $\frac{1}{6}$.
	Jhelum -	18·6	12·4	3	5,88,918	0 12 2	Not stated.
	Gujrat - -	30·8	26·1	13	5,72,129	0 13 2	$\frac{1}{6}$.
	Shahpur - -	15·7	11·8	64	3,89,336	0 15 10	Not stated.
Mooltan - - -	Mooltan - -	7·3	5·1	79	5,46,003	0 13 10	$\frac{1}{8}$.
	Jhang - - -	13·0	10·3	69	2,97,594	1 1 9	$\frac{1}{10}$.
	Montgomery -	8·7	6·3	62	4,08,867	0 12 2	$\frac{1}{6}$ (?).
	Muzaffargarh - -	13·1	6·1	63	5,27,558	1 5 2	$\frac{1}{7}$.
Derajat - - -	Dera Ismail Khan -	8·4	7·9	32	3,97,381	0 12 10	Varies generally from $\frac{1}{6}$ to $\frac{1}{10}$.
	Dera Ghazi Khan -	9·6	1·2	57	3,49,139	0 5 2	$\frac{1}{8}$.
	Bannu - - -	12·0	9·5	15	4,35,280	0 15 3	$\frac{1}{12}$.
Peshawar - - -	Pesháwar - -	27·1	12·9	25	6,75,693	0 13 11	Irrigated land, $\frac{1}{6}$. Unirrigated land, $\frac{1}{12}$.
	Kohat - -	20·2	20·2	38	95,646	0 10 4	Irrigated land, $\frac{1}{4}$. Unirrigated land, $\frac{1}{8}$.
	Hazára - -	46·3	35·9	10	2,22,191	0 13 0	Less than $\frac{1}{6}$.

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* It is believed that this is understated. The revised Settlement Report (of 1865–9) says that 43 per cent. is irrigated, viz., by wells 35 and, by canals 8. The latter has increased since settlement. 7 per cent. also is sailab.

(A.)—Summary of the Revenue Rates assessed on Irrigated Lands.

[Rates per acre, except where otherwise stated.]

Division.	District.	Source of Irrigation.	Settlements made before 1862. Year.	Highest.	Lowest.	Settlement made since 1862. Year.	Highest.	Lowest.
				Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.
Delhi -	Delhi - -	Wells - -	—	—	—	1878	4 0 0	2 4 0
		Canals - -	1838	3 2 0	2 6 0	1878	3 0 0	2 12 0
	Gurgaon - -	Wells and canals	1849	4 0 0	1 8 0	1876	3 8 0	1 8 0
	Karnál - -	Do. -	1847	2 12 0	2 6 0	1878	2 14 0	1 14 0
Hissar -	Hissar - - -	Canals - -	1864	1 4 0	0 12 0	—	—	—
	Rohtak - -	Wells and canals	—	—	—	1878	2 12 0	2 0 0
	Sirsa - -	Wells - -	1856	1 0 0	1 0 0			
Umballa -	Umballa - -	Wells - -	1855	5 8 0	1 0 0			
	Ludhiána - -	Cannot be given.						
	Simla - - -	—	—	—	—			
Jullundur -	Jullundur - -	Wells - -	1851	6 0 0	2 8 0			
	Hoshiárpur -	Do. - -	1851	5 4 0	2 0 0			
	Kangra - -	No rates framed.						
Amritsar -	Amritsar - -	Wells and canals	1854	4 5 3	0 14 6	1865	Not reported.	
	Siálkot - -	Wells - -	1854	3 4 0	1 1 0	1865	Do.	Do.
	Gurdáspur -	Wells and canals	1854	4 7 0	1 2 11	1865	Do.	Do.
Lahore - -	Lahore - -	Wells - -	1854	2 0 0	0 9 0	1868	Per well. 14 0 0	Per well. 6 0 0
	Ferozepore -	Do. - -	1856	1 6 0	1 3 0	1872	Per well. 12 0 0	Per well. 8 0 0
							(Muktsar and Mamdot only).	
	Gujranwala - -	Do. - -	1854	2 0 0	1 0 0	1866	Per well. 20 0 0	Per well. 8 0 0
Rawalpindi -	Rawalpindi -	Wells - -	1864	7 0 0	1 8 0	—	—	—
	Jhelum -	Do. - -	1857	5 4 0	2 5 0	1878	5 0 0	2 4 0
	Gujrat - -	Do. - -	1858	2 6 0	1 2 0	1868	Not stated.	
	Shahpur - -	Do. - -	1854–66	2 8 0	1 0 0	—	—	—
Mooltan - -	Mooltan - -	Wells and canals	1855–59	2 8 0	0 12 0	1878	3 2 0	0 8 0
	Jhang - -	Wells - -	1856	2 4 0	1 2 0	1878	1 8 0	1 4 0
	Montgomery -	Do. - -	1856	1 12 0	1 0 0	1872	Per well, Rs. 30	Per well, Rs. 10
				Per well.				
			1856	50 0 0	2 0 0	—	—	—
		Canals - -	1856	3 0 0	0 12 0	1872	3 0 0	0 12 0
	Muzaffargarh -	Wells and canals	—	—	—	1878	1 3 3	0 14 0
Derajat - -	Dera Ismail Khan	Wells and perennial streams.	—	—	—	1878	2 8 0	0 4 0
	Dera Gházi Khan -	Wells and canals	—	—	—	1874	5 0 0	0 11 0
	Bannu - -	Do.	—	—	—	1878	10 0 0	0 8 0
Peshawar -	Peshâwar -	Wells -	—	—	—	1878	10 0 0	0 8 0
		Canals - -	—	—	—	1878	12 0 0	2 0 0
	Kohát - -	Wells - -	—	—	—	1878	6 0 0	1 14 0
		Streams and channels and the Toi.	—		—	1878	6 8 0	1 12 0
	Hazára	Wells, &c. -	1861–62	8 0 0	1 0 0	1872	8 0 0	1 0 0

(B.)—Summary of the Revenue Rates assessed on Sailab Lands, *i.e.*, Moist Alluvial Lands in the Vicinity of or Annually Inundated by Rivers.

[Rates per acre.]

Division.	District.	Settlements made before 1862. Year.	Highest.	Lowest.	Settlements made since 1862. Year.	Highest.	Lowest.	Remarks.
			Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	
Delhi -	Delhi - -	1838	3 2 0	2 6 0	1878	3 0 0	2 0 0	
	Gurgaon - -	1849	3 3 3	1 8 0	1878	3 0 0	1 8 0	
	Karnál - -	No such rates.						
Hissar - -	Hissar - - -	—	—	—	1864	0 10 0	0 8 0	
	Rohtak - -	—	—	—	1878	3 0 0	2 12 0	
	Sirsa - - -	1856	0 13 0	0 13 0				
Umballa - -	Umballa - -	Not stated.						
	Ludhiána - -	Cannot be given.						
	Simla - - -	—	—	—				
Jullundur - -	Jullundur - -	Cannot be stated.						
	Hoshiárpur - -							
	Kángra - -	No rates framed.						
Amritsar	Amritsar - -	1854	3 4 0	1 8 3	1865	Not reported.		
	Siálkot - -	1854–59	2 4 0	0 8 0	1865	Not reported.		
	Gurdáspur - -	1854	4 1 3	2 1 2	1865	Not reported.		
Lahore - -	Lahore - -	1854	1 2 0	0 9 0	1868	1 0 0	1 0 0	
	Ferozepore - -	1856	0 14 0	0 14 0	1872	0 13 0	0 6 0	
					(Muktsar and Mamdot only.)			
	Gujránwála - -	1854	1 8 0	1 0 0	1866	1 8 0	1 4 0	

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(B.)—SUMMARY of REVENUE RATES assessed on SAILAB LANDS, *i.e.*, MOIST ALLUVIAL LANDS in the VICINITY of or ANNUALLY INUNDATED by RIVERS—*cont.*

DIVISION.	District.	SETTLEMENTS MADE BEFORE 1862.			SETTLEMENTS MADE SINCE 1862.			Remarks.
		Year.	Highest.	Lowest.	Year.	Highest.	Lowest.	
			Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	
Rawalpindi	Rawalpindi	1864	3 8 0	0 4 0	—	—	—	
	Jhelum	1857	2 12 5	1 9 8	1878	1 8 0	1 4 0	
	Gujrát	1858	2 0 0	0 14 0	1868	2 0 0	0 14 0	
	Shahpur	1854–66	1 12 0	1 4 0	—	—	—	
Mooltan	Mooltan	1855	1 2 0	0 4 0	1878	1 4 0	0 12 0	
	Jhang	1856	1 8 0	0 10 0	1878	1 0 0	0 8 0	
	Montgomery	1856	1 6 0	0 12 0	1873	Not stated.		
	Muzaffargarh	—	—	—	1878	1 2 0	0 12 0	
Derajat	Dera Ismail Khán	—	—	—	1878	1 6 0	0 11 0	
	Dera Ghâzi Khan	—	—	—	1874	0 15 2	0 5 0	
	Bannu	—	—	—	Not stated separately.			
Peshawar	Peshâwar	—	—	—	1876	2 0 0	0 12 0	
	Kohát	—	—	—	1878	0 12 0	0 8 0	
	Hazará	Not stated separately.						

(C.)—SUMMARY of the REVENUE RATES assessed on ORDINARY DRY LANDS, *i.e.*, LANDS entirely dependent on RAIN.

[Rates per acre.]

Division.	District.	SETTLEMENTS MADE BEFORE 1862.			SETTLEMENTS MADE SINCE 1862.			Remarks.
		Year.	Highest.	Lowest.	Year.	Highest.	Lowest.	
			Rs. A. P.	Rs. A. P.		Rs. A. P.	Rs. A. P.	
Delhi	Delhi	—	1 10 0	0 12 0	1878	1 12 0	0 10 0	
	Gurgaon	1849	2 0 0	0 7 0	1878	1 8 0	0 9 0	
	Karnál	1847	1 8 0	0 8 0	1878	1 8 0	0 8 0	
Hissar	Hissar	1864	0 6 0	0 3 0	—	—	—	
	Rohtak	—	—	—	1878	1 6 0	0 6 0	
	Sirsa	1856	0 4 0	0 3 0	—	—	—	
Umballa	Umballa	1855	3 10 0	0 7 0	—	—	—	
	Ludhiána	Cannot be given.						
	Simla	Ditto.						
Jullundur	Jullundur	1851	3 0 0	1 0 0	—	—	—	
	Hoshiárpur	1851	3 4 0	0 4 0	—	—	—	
	Kángra	No rates framed.						
Amritsar	Amritsar	1854	2 6 2	0 7 5	1865	Not reported.		
	Siálkot	1854–59	2 10 0	0 8 0	1865	Ditto.		
	Gurdáspur	1864	2 11 6	0 14 0	1865	Ditto.		
Lahore	Lahore	1854	1 0 0	0 3 0	1868	1 0 0	0 5 0	
	Ferozepore	1856	0 9 0	0 6 0	1872	0 13 0	0 6 0	
	Gujránwála	1854	1 0 0	0 4 0	1866	0 14 0	0 7 0	
Rawalpindi	Rawalpindi	1864	3 8 0	0 8 0	—	—	—	
	Jhelum	1857	2 1 0	0 6 0	1878	2 8 0	0 6 0	
	Gujrát	1858	1 8 0	0 6 0	1868	1 8 0	0 6 0	
Mooltan	Shahpur	1854–66	0 8 0	0 8 0	—	—	—	
	Mooltan	1855–59	0 4 0	0 4 0	1878	0 4 0	0 4 0	
	Jhang	1856	0 8 0	0 8 0	1878	0 8 0	0 8 0	
	Montgomery	1856	0 10 0	0 6 0	1873	0 13 0	0 6 0	
	Muzaffargarh	No Báráni cultivation possible, owing to scant rain-fall.						
Derajat	Dera Ismail Khan	—	—	—	—	0 8 0	0 1 0	
	Dera Ghâzi Khan	—	—	—	—	0 6 1	0 1 0	
	Bannu	—	—	—	—	2 0 0	0 1 0	
Peshawar	Peshâwar	—	—	—	—	0 12 0	0 2 6	
	Kohát	—	—	—	—	0 6 0	0 3 0	
	Hazára	1861–62	2 0 0	0 8 0	1872	4 0 0	0 2 0	

Is the incidence on the various classes of land fairly distributed, or would you propose any re-adjustment of it?

The incidence of the revenue on the various classes of land is fairly distributed. The land revenue system of the province provides material securities for this. The settlement of each district being made for 20 or 30 years, as described in reply to the next clause of this question, at the expiration of that term the district comes under re-settlement. The Settlement Officer is required to report in detail the new assessment which he proposes to impose. A separate report is required for each tahsîl. To this end he estimates the value of the gross produce, and the share thereof to which Government is customarily entitled in each tract composing the tahsîl under report; he then explains the proportion of this which each soil ought to contribute, stating the result in the form of average rates on each main class of soils. In doing this he is expected to show that he has observed a just mean between an over minute and arbitrary classification of soil on the one hand, and on the other hand a classification so broad as not to neglect substantial diversities of fertility, natural or artificial, locally recognized by the owners in their dealings with each other, or with their tenants. It is necessary to pay attention to this subject, because the assessment of each tahsîl being first estimated in the lump, the power of distributing it justly over each village depends on a just appraisement of the relative value of the principal soils. The proportion of different soils held by each village is never the same. The Settlement Officer's preliminary report having been approved by the Financial Commissioner, the next step is to divide the gross assessment sanctioned for the tahsîl, or for each principal tract contained therein, over the villages of which it is made up. This is done by applying to the areas of each village the average rates which the Financial Commissioner has sanctioned. The Settlement Officer, however, is not required to apply the rates blindly, but to consider how far the circumstances of each village agree with the average condition of the tract. If the soils or any one soil of a village is better or worse than the average of the tract, or if there are any other circumstances affecting the prosperity or productiveness of the village and its rent-paying power, he is required to adjust the assessment correspondingly thereto. Having thus assessed each village, he again reports the result. This report is in the form of a tabular statement; in this statement each village is entered separately; and in cases in which the assessment proposed for a village differs from that indicated by the general rates before sanctioned, the Settlement Officer is required to record his reasons for the divergence. These proposals being sanctioned, each village is informed of the total sum assessed on it. At this point a new check comes into play for insuring the fair distribution of the revenue. The Settlement Officer cannot dictate to a village the manner in which it should divide the assessment over the holdings of which it is composed, nor impose on the owners his own average rates as their guide in the division of the assessment among themselves; he can, and does, no doubt, influence them materially; but this influence could not be successfully extended to the forcing on them of arbitrary or unfair relative assessment of soils. The form of the assessment will, in some cases, decide the question partially; and this occurs usually in the assessment of canal irrigated villages, where so much of the assessment as is due to irrigation profits is levied by fixed rates on the various descriptions on crops cultivated each year; the amount assessed in each year thus depending partly on the extent of irrigation and the manner in which it is applied. Omitting this and a few other similar instances, the manner in which the gross assessment of a village shall be divided over the holdings is decided by the village owners themselves. In the great majority of cases, especially where the gross assessment has been fairly made, the village owners succeed in doing this amicably. They are practical agriculturists; they have been paying similar assessments for years past; and if in Sikh rule they paid the revenue by a share of the produce, that share usually varied according to the value of the main soils. Moreover, if a Settlement Officer commands the confidence of the people among whom he is employed, the owners of most villages as a matter of fact will not attempt to overreach each other in matters of this sort. Of course in a certain number of cases disputes do arise, though they are rarely very complicated or difficult. When a complaint is filed before the Settlement Officer (the jurisdiction of the civil courts in such matters is barred), it is heard as a revenue case, and there is an appeal from the decision to the controlling revenue authorities. The complaint may be, that the method of distributing the revenue, which the other side desire to enforce, is opposed to the tenure on which the village is held; as where a village is owned on shares, and it is attempted to distribute the revenue on a different principle, or on different shares than the shares of ownership;—or where the village is not owned on shares, the petitioner may complain that the relative value of the soils has been unfairly appraised, or that his own fields have been wrongly classed. The principal basis of decision in these cases is the past practice of the village concerned, and the common practice of adjacent villages similarly situated. No doubt such practice is not an infallible guide; and no doubt also there is a steady action in our settlement whereby inequalities previously existing are corrected under the influence of the views held by the settlement authorities. But we have never attempted to introduce any arbitrary soil classification of our own, and have mainly confined our action to assisting the people to settle such questions voluntarily among themselves; and when they have failed to do so, we have decided such disputes, as far as possible, on the lines already laid down by the agricultural practice of the neighbourhood.

In short, while it is believed on the one hand that the incidence of the revenue on the various classes of soils is fairly distributed, being based on distinctions locally recognized, and on the voluntary action of the land-owners in dividing the gross assessment of each village over their holdings; on the other hand no attempt has been made to make the existing distribution permanent. As the revenue leases of each district expire, and a new settlement is made, the existing system of assessment compels the revenue authorities to reconsider the matter thoroughly; and independently of this action, the landowners have it in their own power on such occasions, either to maintain the former distribution, or to remedy any inequalities which they may consider to exist—a power with which the revenue authorities will not interfere, except upon proof by dissentients that the former system or proposed innovations are inequitable.

When was the assessment fixed?—The whole of the Delhi division, with one exception, has been under re-settlement since 1872, when the assessments (made 30 years before) expired. The exception is a portion of the Karnál district of which the existing leases will expire in 1880, having been made 30 years previously.

In the Hissar division the Rohtak district has been under re-settlement since 1873, its previous 30-year lease having then expired. The Hissar district was settled on a 20-year lease in 1863, and the Sirsa district at various dates about 20 years ago, which expired in 1876. The Sirsa District is about to be placed under re-settlement.

In the Umballa division the existing assessments were nearly all made about 30 years ago. The Ludhiána district has been placed under re-settlement, and the Umballa district will shortly be so treated; the leases in both districts having expired or being on the eve of expiring.

The Jullundur division is in the same position as the Umballa division.

The Amritsar and Lahore divisions, except the Ferozepore district, were settled from 10 to 13 years ago on 20 year leases, which will expire between 1885 and 1888. The greater part of the Ferozepore district was settled on a 30 year lease 24 years ago; the assessment will expire in 1884; and that of the rest of the district, settled later, in 1892.

In the Rawalpindi division, the district of that name and the Shahpur district were settled 20 years ago, and the Gujrat district 10 years ago. The leases of these three districts run for 20 years from completion of the assessment, expiring respectively in 1880, 1881, and 1888. The Jhelum district's leases expired in 1874, and the district has since been under re-assessment.

In the Mooltan division the Montgomery district was settled on a 20 year lease about 1870–73. The rest of the division has been under re-settlement for the last five years.

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In the Derajat division the district of Dera Ghâzi Khan was assessed on a 20 year lease in 1873. The rest of the divisions also has lately been re-assessed, the operations being just completed.

In the Peshâwar division the Kohat district is under settlement; the Peshâwar district has a 20-year lease, and the Hazâra district a 30-year lease, dating from 1874.*

It is necessary to explain the principle on which the dates and duration of each district lease is fixed. It is the fixed policy of Government to give usually leases of 30 years' duration, but for sufficient reason the term is restricted to 20 years or even a shorter period. Such reason may be that the assessment is apparently inadequate, and that important changes, such as the extension of canal irrigation, are impending.

In the next place, it has lately been decided to restrict the number of districts under settlement at one and the same time. It has been found by experience very embarrassing to subject a large number of districts to settlement operations simultaneously; the revenue establishments in all grades become abnormally enlarged; the difficulty of supervising extensive assessment operations is very great; and if important issues are raised, they are presented in a form affecting such large areas that their decision involves great responsibility and very wide-spread results. Moreover, after a few years of these extensive operations no more districts remain to be re-settled; and the Government is consequently compelled to dismiss valuable establishments, and to absorb the covenanted Settlement Officers in the regular line of administration. Subsequently, a few years later, when the leases of other districts have fallen in, these establishments have to be formed anew with great difficulty, and much of the experience before gained has been lost by the hiatus which has occurred in the operations. Under the system lately adopted, by only undertaking the re-settlement of a small number of districts at a time, these evils are avoided. The re-settlement of a district ordinarily takes from four to five years; it follows that six districts can be settled in 30 years; and therefore that with five settlement establishments working in the Punjab,† all the leases would have been revised in the same period; and the leases of those first settled would have by that time expired; so that the five settlement establishments will have continuous employment. The number of settlement establishments is at present in excess of five, but will shortly be reduced to that number. The application of a system of this sort no doubt needs some care, to prevent loss of revenue to Government during its introduction; but it has been ascertained that there are no insuperable, or even very serious, difficulties of this nature; and the system admits of some elasticity of application, as it would be comparatively easy to increase five settlement establishments on occasion to six, or to reduce them temporarily to four. But perhaps the value of the system to the people of the province is even greater than its value to Government, for it ensures that the establishments employed on settlement work shall be carefully trained, and possess steadily accumulating experience; and also that the controlling authorities shall have leisure to consider fully the important issues raised in the course of their operations.

Has there been any practical difficulty in realizing the land revenue as now assessed? At what dates are the instalments of revenue payable, and what relation do these bear to the ordinary periods of harvest or of realization of rents, as the case may be? Do the several instalments bear a fair proportion to the value of the several harvests from which the revenue or rent has to be made good? What rate of interest, if any, is charged on land revenue in arrear?

The land revenue has been realised with ease in the whole province for years past. In the few years immediately following annexation (A. D. 1849), our assessments were necessarily based on the heavier collections of Sikh rule; we had little knowledge of the country at our command; the prices of grain were much depressed, and the peaceful influences of our rule had scarcely begun to tell on the community at large. Under such circumstances it was not to be expected that the land revenue would always be realised with ease. But from the first the use of the severer measures of coercion known to the Land Revenue Law of India was discountenanced. Attempts to sell, transfer, or farm the lands of defaulters were avoided wherever possible; in fact, almost entirely. This action was partly based on a sense of the great difficulties involved in the consolidation of our rule in those earliest days of the Punjab administration; and partly prompted by the personal experience of the principal civil officers first entrusted with its Government, officers who had seen with their own eyes in our older provinces the evil wrought by the use of severe measures to realise a revenue evidently paid with difficulty. We knew that, if we would secure the prosperity and contentment of the country, we could not expect to realise a revenue pitched at the same heavy incidence as that levied by the Sikh rulers. We also knew that the mere striking off a per-centage of what our predecessors had levied was in all cases a very rough measure of relief, and in not a few cases probably an insufficient one. Any attempt to realise balances with severity was consequently avoided from the first. New settlements of a complete or summary character were rapidly pushed on, and the growth of the cultivated area gave whatever additional relief was required. It followed that ten years after the Punjab was annexed the difficulties of over-assessment which the Sikh Government had bequeathed to us had disappeared; higher prices set in; and from that time to the present the cases of difficulty in realising the assessment have been few and exceptional.* Further information on the subject is given in the reply to question 14.

As regards the instalments in which the land revenue demand is paid, over the greater part of the province, they are four in number, payable at the following dates:—

RABI	1st Instalment	15th June.
	2nd. Instalment	15th July.
KHARIF	1st Instalment	1st December.
	2nd Instalment	1st February.

There are local differences of practice, which have been allowed to suit specialities of season and crop; but no object would be served by detailing minor differences of this nature. The principle on which the above instalments were fixed, and variations from them are allowed, is that the agriculturists should be allowed full time for harvesting their crops, and landowners for collecting their rents, before they are required to pay the revenue demand. If the reply to question 5 be referred to, it will be seen that the harvesting of the Rabi crop is completed by May, and that of the Kharif by November (except sugar-cane, which is later); so that the above dates for paying the revenue amply meet the principle on which they were fixed. There is indeed in the Financial Commissioner's opinion reason to fear that the liberality of Government in thus delaying its demand has in some cases been carried too far. The Patwârí (revenue accountant) of each village is bound to have ready a month

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* In the foregoing remarks I have abbreviated details as much as possible, the object, I presume, being rather to give a summary of the subject than unimportant details concerning each district. The dates are taken from statement 23 appended to the Annual Revenue Report for 1876–77, the last issued.

† The number of districts is 32; of which one, Simla, is very small.

* The total number of warrants issued for revenue over-due in the year 1876–77 was 47,850; and only in 142 cases was it necessary to enforce them by personal imprisonment, and in 217 cases by distraint of chattels.

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before the revenue of each harvest falls due a statement showing the demand payable by each owner.

As regards the proportion that each instalment bears to the value of the harvest for which it is paid, there is no reason to suppose that it is otherwise than fair. These proportions were originally established at a time when much of the revenue was levied in kind, or if levied in cash was assessed at each harvest by appraisement of the standing crop; and they were presumably based on the accounts of what was actually levied under such systems. The agriculturists, moreover, do not view with favour innovations in matters of this kind until a substantial necessity arises for them, or unless the changes to be introduced carry with them some obvious advantage.

Both this subject and also that of the dates and number of instalments are open to re-adjustment at each settlement of a district; and any changes which are desired, or for which a substantial reason can be shown, are then sanctioned by the Local Government. Several proposals of this nature have been sanctioned in the late settlement of the Mooltan, Derajat, and Peshâwar divisions.

The following table shows the proportion of the land revenue of each division paid at each harvest, and roughly the manner in which that compares with the produce of each harvest;—

Division.	Per-centage of the annual demand paid.		Of the average annual area cultivated with crops, what per-centage is cultivated with		REMARKS.
	At the Rabi harvest.	At the Khárif harvest.	Rabbi crops.	Khárif crops.	
Delhi - - -	51	49	40	60	The last two columns only show the area of the crops of each harvest. It would not be possible to show the value without entering into a complicated calculation.
Hissar - -	35	65	21	79	
Umballa - -	47	53	55	45	
Jullundur - -	43	57	55	45	
Amritsar - -	50	50	61	39	
Lahore - -	55	45	58	42	
Rawalpindi -	54½	45½	59	41	
Mooltan - -	57	43	69	31	
Dereját - -	58	42	59	41	
Peshâwar - -	41	49	63	37	
Total -	49	51	51	49	

It should be added that so much of the land revenue as may be assumed to be contributed by grazing and milch produce is by the old customs of the country a kharíf demand. It is only in autumn that the grasses of the hills and waste plains attain any nutritious growth, and the dues levied by owners on cattle grazing are very generally known by the name of *sawani*, or the dues of sáwani (15th July to 15th August), the month when the grass grows. The richer crops, sugar-cane, rice, cotton, indigo, &c., also belong to the kharíf season.

No interest is charged on land revenue in arrears.

Mr. Thornton.

NOTE by MR. T. H. THORNTON on an Article by MR. HYNDMAN in the "Nineteenth Century," entitled the "*Bankruptcy of India,*" considered with reference to the Province of the Punjab.

I.

A full and complete criticism of Mr. Hyndman's paper must necessarily be a work of time and of more minds than one, for it involves acquaintance — and more than superficial acquaintance—with the state and circumstances of a population of 200,000,000, a population divided into races widely differing from each other in habits and in language, spread over an area 12 times the size of the United Kingdom, and living under distinct physical and administrative conditions. But, meanwhile, an examination of his statements, as applied to one out of the nine provinces of British India, will not, perhaps, be valueless.

If his conclusions are shown, so far as that province is concerned, to be erroneous, this, of itself, will be a point gained; the area of alleged insolvency will be sensibly contracted and an instalment of relief afforded to the public creditor, while, should the process of investigation reveal, as I believe it will reveal, errors or misconceptions affecting the principles of Mr. Hyndman's calculation, fair ground will be given for questioning the correctness of his conclusions generally. I propose then to examine Mr. Hyndman's statements with special reference to the province of the Punjab, a province with an area larger than Great Britain, and a population—allowing for increase since the census of 1868—of 20,000,000 souls. I select this province simply because it is the part of India in which I have been employed for many years, and I propose on this occasion to restrict my inquiry to its agricultural population of 11,000,000, leaving the non-agricultural population to be dealt with, if necessary, in a future paper.

Before proceeding further, let me briefly recapitulate the main points of Mr. Hyndman's arguments. The annual value of the agricultural produce of British India, Mr. Hyndman says, is 300,000,000*l.* This sum divided amongst a population of 190,000,000, gives an average yearly income per head of 31*s.* 6*d.*, But, judging from the cost of dieting a prisoner in the Bengal gaols, viz., Rs. 28 or 2*l.* 16*s.* per annum, the cost of food alone (irrespective of clothing, repairs, feed of bullocks and other contingencies) must amount, all round, to Rs. 23, or 46*s.* per head of population. *Ergo*, the people have not the means sufficient to procure even the necessaries of life. Furthermore, supposing the produce to be divided, not amongst the entire population, but amongst the agricultural population only, still, as this population comprises 150,000,000 out of the 190,000,000, the same result will be obtained, namely, that the mass of the people have not the wherewithal to support a healthy existence. In these circumstances, the taxation (Imperial and local), though falling at the low rate of 5*s.* per head, is crushing; India is becoming more and more impoverished, whilst the soil, ill-farmed and over-cropped to meet immediate necessities, is year by year deteriorating.

The first criticism suggested by these statements is one of a somewhat fundamental character, but it will be endorsed, if I mistake not, by all who are familiar with the circumstances of peasant life in India; it is that Mr. Hyndman's method of gauging the financial condition of the agriculturist is an exceedingly fallacious one. It proceeds upon the supposition—a very natural one for Englishmen, but not the less erroneous—that the Indian peasant, like the English farmer, sells all his produce and buys all his supplies. Fortunately or otherwise for himself, but unfortunately for statists, the Indian peasant, as a rule, pursues a different course. He retains so much of his produce as he requires for seed and home consumption and disposes of the surplus only; and this surplus he does not ordinarily sell in open market, but makes over to the village *banyan* with whom he has an account current for cash advanced and goods supplied. To attempt to give a money value to these primitive transactions and formulate the financial condition of the peasantry in terms of cash receipts and payments must be, under such circumstances, a very hazardous undertaking. To do so, without local knowledge, is certain to result in error.

But the method, bad or good, has been used by Mr. Hyndman, and used, indeed, with startling effect. It will be well, therefore,—in the first instance, at all events—to follow the method he has employed, but test, with the aid of local knowledge, the correctness of his calculations.

Let us therefore examine Mr. Hyndman's statements with special reference to the agricultural population of the land of the Five Rivers.

In other words, let us estimate, so far as circumstances permit, the receipts and expenditure of the Punjab peasantry, inquire into the distribution of their profits and the pressure of their taxation, and see how far the situation corresponds with the gloomy picture given in the preceding paragraph.

II.

What then, are the annual receipts of the Punjab agriculturists?

They are estimated by Mr. Hyndman at 33,800,000*l*. sterling, a result arrived at by taking the area under cultivation at 20,957,735 acres, or, in round numbers, 21,000,000 acres, the yearly value of the produce at 36,000,000*l*., and deducting from the latter the sum of 2,200,000*l*., as representing the value of seed grain.

In the above calculation the statement of area cultivated and the value of its produce may be accepted as approximately correct. It is taken, in fact, directly or indirectly, from the report of the Punjab census of 1868 and the statistical returns published annually by the Punjab Government; some further details, derived from the same source, are given in the subjoined table :—

Crop.	Average Area under Crop in Acres.	Average Produce in Lbs.	Value, at average Market Rates, in £.	Remarks.
Wheat - - - - -	6,000,000	5,280,000,000	13,200,000	I have taken the average produce per acre of wheat at 880 lbs.; barley at 1,040 lbs.; maize and millets from 425 to 610 lbs.; pulses at 400 lbs. all round; rice at 850 lbs.; oil-seeds at 420 lbs.; cotton (cleaned) at 100 lbs.; in accordance with the opinion of the Financial Commissioner based upon a series of experiments and returns of average yield obtained from all classes of soil in all parts of the province. Where the returns of average yield are less reliable, I have based the estimate of value chiefly on the selling price of the standing crop. Thus sugar-cane and poppy have been valued at 5*l*. an acre, condiments and vegetables at 4*l*., tobacco and indigo at 3*l*. The market values have been calculated on the average of seven years ending in 1877–78.
Barley, Maize, and Millets	7,500,000	4,900,000,000	8,900,000	
Pulses - - - -	3,300,000	1,320,000,000	3,000,000	
Condiments, Pepper, Turmeric, Coriander, &c. - - -	200,000	100,000,000	800,000	
Rice - - - -	735,000	624,000,000	3,400,000	
Vegetables - - -	200,000	1,200,000,000	800,000	
Oil-seeds - - -	720,000	300,000,000	1,000,000	
Cotton - - - - -	630,000	63,000,000	1,000,000	
Sugar-cane - - -	374,000	600,000,000	1,800,000	
Tobacco - - - -	74,000	74,000,000	200,000	
Indigo - - - -	100,000	4,000,000	300,000	
Poppy (heads, opium, and seed)	12,500	8,400,000	60,000	
Miscellaneous crops of food grains, fibres, dyes, fruits, &c., &c. - - -	804,500	- - -	1,540,000	
Total -	21,000,000	- - -	£36,000,000	
	The area given above does not include fallows amounting to 4,000,000 acres, more or less.	Deduct for seed	2,200,000	
		Balance - -	£33,800,000	

But here we encounter the first of Mr. Hyndman's "misconceptions." A statement of the annual value of the harvests, however accurately estimated, is not an exhaustive account, or anything like an exhaustive account, of the receipts of agriculturists. Such statement, besides leaving out of view a multitude of minor sources of profit, such as receipts from sale of straw and other fodder, the produce, other than fruit, of cultivated trees and shrubs,[*] and the gain, sometimes considerable, from the sale of fish, eggs, and poultry, takes no cognizance of three important items of a peasant's income, viz., the proceeds of *dairy*, *stock*, and *forest* produce.[†]

In the case of the province with which we are at present concerned, two out of the above three items, viz., *dairy* and *stock* produce, are specially remunerative; for, while the local demand for them is more than ordinarily great, the opportunities for production are exceptionally favourable. The local demand is more than ordinarily great, because the bulk of the population are (for India) large consumers of flesh, milk, and ghee, and require, for at least six months in the year, protection against the cold in the shape of blanketing and woollen wrappers. The opportunities for production are exceptionally favourable by reason of the large extent of land available for pasture. Many of the Punjab villages, especially in districts west of the river Satlaj, and south of the Salt Range, possess, in addition to the ordinary fallows, large areas of waste; while in the *Doabs* or stretches of low jungle between the beds of the large rivers, there are millions of acres of grazing land, the property of the State, where large numbers of buffalo, cattle, sheep, and goats are pastured on payment of a small fee.

With regard to *forest* or *jungle* produce, leaving out of view income derived from such items as barilla,[*] saltpetre, gum, lac, bamboos, catechu,[†] tamarisk galls,[‡] dhak leaves,[§] manna, wild honey, fruits[‖] and fibres;[¶] no small returns are derived from the sale of two of the prime necessaries of life—timber and firewood. The former source of profit is confined chiefly to villages of sub-montane, or hill districts, where the country is well wooded, but many village communities in the plains have, in their waste or jungle lands, large supplies of fuel, which they dispose of to the non-agricultural population at an average rate of 1*s*. per cwt.

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[*] The following are a few specimens :—

Kikar (*Acacia arabica*).—The commonest tree in the Punjab. Bark largely used in tanning and spirit distillation; seeds in dyeing.

Tún tree (*Cedrela toona*).—Flowers yield a yellow dye.

Plantain.—Leaf used for fibre.

Mauwa (*Bassia latifolia*).—Spirit distilled from the flower, and a valuable oil expressed from the seed.

Amaltas (*Cassia fistula*).—Seeds and flower used largely as medicine; bark in tanning.

Fálsa (*Grewia asiatica*).—Bark used for fibre.

Harítha (*Sapindus acuminatus*).—Seeds largely used as a substitute for soap.

Bahera (*Terminalia, belerica,* and *chebula*).—Common in the hills. Bark used in tanning; fruit valuable as a medicine; the produce of one tree sometimes selling for Rs. 2,000.

Add to which the flowers of the jessamine and willow, &c., common in many villages, are largely employed in the manufacture of perfumes.

[†] Under *dairy* produce I include milk and its products, viz., *ghee* or clarified butter, *dahi* or curds, butter-milk, and cheese; under produce of *stock* I include wool, hair, hides, and skins, meat and animals sold for draught or dairy purposes; under *forest* produce I include receipts from sale of timber and fuel, and the spontaneous produce of uncultivated lands.

[*] Made from the ashes of wild-growing *salsolas*, known locally as *lahna*.

[†] The coagulated extract from the *Acacia catechu*—the *Terra japonica* of commerce.

[‡] Used in tanning and dyeing.

[§] The leaves of the dhak (*Butea frondosa*) yield a yellow dye, and its bark is used for ropes.

[‖] *e.g.* the fruit of the pilu (*Salvadora oleoides*), the wild caper, the jhand (*Prosopis spicigera*), and the wild plum largely consumed as food by the poor.

[¶] Especially the grass known as munj (*Saccharun munja*) much used for well ropes, thatching, and furniture.

No complete returns of either dairy, stock, or forest produce are available, and I cannot myself pretend to any practical acquaintance with farming or with forestry, but, with the help of official statistics and the information afforded by English and native experts, I venture, at the risk of being extremely tedious, to give the following rough estimates of the amount and value of these sources of income :—

(1). *Milk and its products.*—Of the milk of cows and buffaloes produced in the Punjab, the greater portion, say three-fourths, is converted into ghee, the butter-milk resulting from the process being retained, for the most part, by the peasantry for home consumption; of the remainder, some is consumed *au naturel*, and the rest in the form of curds, and occasionally cheese.* For estimating the value of this produce the following data are available :—

(*a.*) From the Punjab stock returns (which are believed, if anything, to understate the truth) it would appear that the number of milch cows and buffaloes in the Punjab cannot be less than 1,500,000, capable of yielding milk, ghee, and curds to the value of at least 4,000,000*l.* annually ;

(*b.*) The amount of ghee allowed to adult prisoners in gaol, *i.e.*, the minimum considered sufficient for the maintenance of health, is 5 lbs. per head per annum ;

(*c.*) The amount imported into towns (as shown in the octroi returns) gives an average annual consumption of 8 lbs. a head ; but this does not include the ghee produced within octroi limits, the amount of which must be considerable ;

(*d.*) The estimate of consumption of ghee in towns, made for the purpose of regulating octroi taxation, gives an average of 9 lbs. per head per annum.

Upon the whole we shall probably be not far wrong if we take 8 lbs. a head as the average yearly consumption of this item of dairy produce. On this assumption the value of ghee annually consumed by the Punjab population of 20,000,000 will amount (at 4 lbs. of ghee per rupee) to 4,000,000*l.*; but in calculating the value of the Punjab produce, the net value of imported ghee, viz., 800,000*l.*, must be deducted, leaving 3,200,000*l.* as the value of the local produce. Taking one-fourth of this amount, or 800,000*l.*, to represent the value of unconverted milk, curds, and cheese, the total value of the dairy produce consumed or sold in the Punjab may be estimated at 4,000,000*l.* yearly.

(2). *Wool and Hair.*—Wool, the produce of the plains, is used in the manufacture of coarse blankets, rugs, and felt; the superior wool of the hill tracts of Kangra, Hazara, and the Salt Range, is woven into a broadcloth known locally as *pattu*, and into *lois*, or woollen wrappers. The soft hair of the camel furnishes material for *chogas* or outer vests, and that of goats is used locally for ropes, matting, and grain bags. Assuming each family of five to purchase but one new blanket annually, the yearly supply of coarse wool required for the mass of the population will amount, at 6 lbs. of wool per blanket, to 24,000,000 lbs. representing, at 3*d.* a lb., a money value of 300,000*l.* Adding to this amount 300,000*l.* as the value of the superior wool of the hill tracts, and of goats and camels' hair, and the sum of 200,000*l.* as the average value of our exports, we may estimate the total annual value of the wool produce of the Punjab at not less than 800,000*l.*

(3). *Hides and Skins.*—The hide of cows and bullocks is used for the upper leather of common shoes, for saddlery, harness, and accoutrements, for flour bags (*khallar*), and in some districts is made into flasks, hookah bowls, and other household utensils. That of the buffalo is used chiefly for shoe soles and for the leather thong connecting the yoke with the plough ; that of the camel for large scale dishes and *kuppas*, or receptacles for oil. Sheep and goat skins are used for the upper leathers of superior kinds of shoes, shoe linings, bookbinding, and water bags, and, in hill districts, are made into a kind of wash-leather used as an article of clothing, and into soft red leather known locally as *lakhi*. *Posteens*, or outer coats of sheepskin, are much used for winter wear on the north-western frontier. The leather manufactures of the province are inferior, but the local consumption is large, and the export not inconsiderable ; shoes go in large numbers eastward, and the soft red leather of Nurpur and otter skins find a market in the north. The export of the raw material has been increasing greatly of late years and is now equal to nearly a third of the hide exports of Calcutta. The market value of the raw hides annually required for the manufacture of common shoes is estimated by experts at 400,000*l.* and of that used for the other purposes above enumerated may be taken roughly at 200,000*l.* The value of hides exported (as shown in the Punjab trade returns) averages 150,000*l.*,* and that of the raw material of leather exports may be taken at 50,000*l.* Altogether 800,000*l.* will not be an excessive estimate of this item of produce.

(4). *Meat.*—(*a*). Assuming the adult population of the Punjab to consume meat to the extent it is allowed to prisoners in gaol, the value of the meat required for the province will amount, at 2*d.* a lb., to 3,300,000*l.* annually.

(*b.*) Assuming the population generally to consume meat to the extent to which the octroi returns and estimates show it to be consumed in towns, the annual value of the meat consumed in the Punjab will be 2,500,000*l.*, without taking into account the value of the better class of meat largely consumed by the troops† and English residents of the province. To be on the safe side we will take the smaller sum, 2,500,000*l.* per annum., as the value of the Punjab meat supply.‡

(5.) *Animals sold for Draught or Dairy purposes.*—Of the value of animals thus disposed of annually it is impossible to form an estimate approaching accuracy ; but the receipts under this head must be considerable. The number of cattle required yearly to replenish the stock employed in cultivation cannot be less than 500,000, and their value, at the lowest market rates, will amount to 1,000,000*l.* sterling ;§ the number of milch cows and buffaloes being, as we have seen, about 1,500,000, the number required annually to keep up the stock cannot be less than 150,000, representing a money value of at least 300,000*l.* Then large numbers of buffaloes and bullocks are purchased from agriculturists for transport of grain and other merchandise, for turning mills and other purposes of draught not connected with agricultural operations. Altogether the value of cows, bullocks, and buffaloes annually sold by agriculturists may be safely estimated at not less than 1,500,000*l.*

Of receipts from the sale of sheep and goats (otherwise than for slaughter), poultry and game, I will not hazard a conjecture.

(6.) *Timber and Fuel.*—Of the value of timber sold by villagers, it is impossible to make more than a very rough calculation.

The last octroi returns show an importation into towns of 220,000*l.* worth of building materials for the use of 2,200,000 of the population, and these must have consisted almost entirely of timber, for bricks are ordinarily untaxed. Assuming then the agricultural population of the province to obtain their timber gratis, the value of the timber used annually by the non-agricultural population for buildings alone will amount to about 900,000*l.*, to which must be added the value of Punjab timber supplied by villagers for the construction and maintenance of railways and other public works, for boat-building, carts, furniture, and other purposes. Altogether 1,000,000*l.* will not, I think, be an excessive estimate for this item of receipt, after making due allowance for the value of timber supplied from Government lands and from the territories of Native States.

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* Cheese is also made from the milk of ewes and goats, but is not an article of general consumption, except, perhaps, among the Patan races of the north-west frontier.

* According to the returns for 1877–78 just received, the value of hides exported in that year was 440,000*l.*

† The meat rations of the British troops in the Punjab, procured on very favourable terms, cost the Government upwards of 40,000*l.* per annum, or about 2*l.* 10*s.* per soldier.

‡ An amount sufficient to furnish the adult population with a little more than 1 lb. of meat a fortnight per head.

§ According to the latest return of cultivation, the area prepared for the spring crop exceeded 12,000,000 acres, requiring, for ploughing and irrigation, at 5 acres per yoke in well lands and 7 acres per yoke in the remainder, upwards of 4,000,000 cattle. Taking 4,000,000 as the number of cattle employed, and assuming each animal to last on an average 8 years, the yearly supply required will be 500,000. As to value, according to the latest yearly returns, the price of plough bullocks in the Punjab ranged from 2*l.* to 5*l.* 10*s.* each, the average being 3*l.* 12*s.* I have assumed the average price to be the lowest of these quotations,—viz., 2*l.*

In regard to fuel it may be observed that the fuel consumed in cooking prisoners' food amounts to 266 lbs. per head per annum, costing at market rates 2*s.* 4½*d.* per prisoner. At this rate the value of the fuel used for cooking purposes by the non-agricultural population (I assume the agricultural population to obtain their fuel *gratis*) would exceed one million sterling annually; but the cooking of prisoners' food being done on a large scale requires a minimum of fuel; the amount allowed a sepoy for the same purpose is exactly four times as large; taking a mean between these two extremes, and reckoning the amount of fuel required per head of non-agricultural population for cooking and other domestic purposes at half the amount supplied to sepoys for cooking only, we shall probably be well within the mark. On this assumption the value of fuel supplied annually to the non-agricultural population for household purposes will amount, at market rates, to 2,000,000*l.*; but this amount does not include the value of fuel supplied for locomotives, steamers, manufactures, and other non-domestic purposes, which must amount to, at least, 300,000*l.* more.

According to the above estimates, the aggregate value of the dairy, stock, and forest produce of the province must amount on the average to at least 13,000,000*l.* This raises the value of the annual produce of the Punjab from 33,800,000*l.*, the amount estimated by Mr. Hyndman, to 46,800,000*l.*

But in estimating the value of this produce to the agriculturist some deduction must be made from its market value on account of cost of carriage, and the profits of the grain dealer or salesman. Allowing a deduction on these accounts of 10 per cent., the average money value of the Punjab produce to its producers, in other words, the receipts of the agricultural population, will amount to 42,120,000*l.*, or in round numbers, 42,000,000*l.* annually, giving an average income per head of about 76*s.* instead of 40*s.* as estimated by Mr. Hyndman.

III.

Having dealt with the receipts, let us proceed to the second stage of our inquiry, and endeavour to estimate the *expenditure* of the Punjab peasantry.

The subject may be conveniently considered under the following heads :—Cost of *food, clothing, repairs and miscellaneous household expenses*; cost of *seed grain, labour, feed of cattle, replenishment of stock, repair and renewal of agricultural implements, keeping well gear in order, manure and other farming contingencies.*

Of the above-enumerated items, Mr. Hyndman has furnished an estimate of one only,—the cost of *food.* His estimate in this case is based on the annual charge per head for feeding prisoners. Finding this charge to amount in Bengal gaols to Rs. 28, or 56*s.* per head, he has taken it to represent the yearly cost of the food of an adult, and, allowing a small reduction for children, assumes an average rate of Rs. 23, or 46*s.* per head per annum, as a fair estimate of the cost of living by the population generally on the Government standard.

Here we are introduced to more of Mr. Hyndman's "misconceptions." Objection might indeed be fairly taken to the adoption, under any circumstances, of Indian gaol dietary as the standard of healthy and sufficient food; for, applying, as it does, to persons subjected to labour, frequently harder and certainly more continuous than in ordinary life, and suffering from the depression resulting from confinement, it is notoriously in excess of the requirements of peasants living at their homes; but, waiving this objection, it is impossible to accept the cost of such dieting, reduced by less than one-fifth, as representing, even approximately, the cost of living by persons of both sexes and of all ages in all parts of India.

In the first place, the Bengal rate of charge for feeding prisoners (Rs. 28 per annum) is by no means universally applicable; it is certainly not applicable in the Punjab, where food is cheap, and prisoners are liberally dieted* at an average cost, in ordinary years, of less than Rs. 20 or 2*l.* per head. To be on the safe side, let us assume the average cost to be 2*l.*

In the second place, the cost of such diet to the population, and especially the agricultural population, is far less than it is in the case of prisoners, and for obvious reasons, for the price of all the constituents of gaol diet, except vegetables, which are grown in the gaol garden, is enhanced by cost of carriage, dealers' profits, agency charges, &c., until it exceeds the price of the same articles at the place of their production by as much, in some cases, as 15 or 20 per cent. To be on the safe side, let us assume the difference of cost to be 12½ per cent. only; this will reduce the cost of diet on the gaol standard in the case of the adult male agricultural population of the Punjab from 40*s.* to 35*s.* per head.

In the third place, in the calculation of his average rate, Mr. Hyndman has made a very inadequate reduction on account of the smaller consumption of food by women, youths, and children. In the Punjab gaols the diet allowed to women and youths between the ages of 12 and 16 is about one-fifth less in amount than that of male adults, that required for children between 12 years and infancy may be safely set down as not more, on the average, than half the amount necessary for working men.

Assuming then the entire agricultural population of the Punjab to live as well as the inmates of our gaols, the cost of their food will be as follows:—

	£
3,500,000 adult males at 35*s.* per annum -	6,125,000
3,000,000 adult females at 28*s.* per annum	4,200,000
1,300,000 youths and girls between 16 and 12 years at 28*s.* per annum - -	1,820,000
3,200,000 children at 17½*s.* per annum -	2,800,000
Total - -	14,945,000

Falling at the rate of less than 28*s.* per head of population, instead of 46*s.* per head as estimated by Mr. Hyndman.

As to *clothing*, the "full dress" of a Sikh cultivator consists of a small turban of coarse cotton cloth, a *khes* or wrapper, short drawers or a waist cloth of the same material, and a pair of stout shoes; in the cold season a cotton quilt or a coarse woollen blanket serves in the double capacity of greatcoat and coverlet. When at work, whether in summer or in winter, he usually dispenses with all save the turban and the waist cloth. Women wear a *lenga* or skirt, a *chádar* or wrapper, generally red and embroidered with rudely executed flowers, and trowsers reaching to the ankle, all of Indian cotton, some wearing in addition a *choli* or small tight-fitting stomacher. The Mahomedan cultivators are, as a rule, more amply clothed, for, in deference to the injunctions of the Prophet, their drawers descend considerably below the knee, and the waist cloth assumes the dimensions of a skirt, reaching from the middle almost to the ankle.*

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* The diet of an adult male prisoner sentenced to labour consists in the Punjab of nearly one pound and a half of flour per diem, pulses four times a week, meat or curds and butter-milk with vegetables and ghee three times a week, condiments daily, and salt at the rate of 11½ lbs. per annum. This scale of diet was adopted by the Punjab Government, on medical advice, after years of practical experience of the food requirements of prisoners; it has proved sufficient to maintain even the hardest labouring prisoners in excellent health, so much so that in nine gaols out of ten the mortality is less than that of London, and far less than that of the town population of India.

The cost of such costume, even in the case of Mahomedans, is not large; judging, indeed, from the clothing charge in gaols, and inquiries made from agriculturists, it must be easy for the Punjab peasant, with the help of homespun cotton, to provide himself and family with raiment and blanketing for 1*l.* a year while his shoemaker's bill for the whole household need not exceed 6*s.* These may appear small sums, but it is to be remembered that, in the Punjab, cotton cloth, well suited for the ordinary wear of the agriculturists, can be procured for 1½*d.* a yard, and coarse woollen cloth or blanketing for 4½*d.* a yard; that a change of raiment can be bought for 3*s.* 3*d.*, and a pair of full-sized shoes for 9*d.* At this rate the cost of clothing the agriculturists of the Punjab may be estimated, on a liberal basis, at 3,000,000*l.* per annum.

The next item is that of *repairs and miscellaneous household expenses.*—The following account of the dwellings and household furniture of the peasantry, taken from Colonel Davies' Report of the settlement of the Shahpore district, may be accepted as applicable to all plain districts in the province:—

"The dwellings," he says, "consist of one or more rooms called *kothas*, with a courtyard in front, often common to several houses. The rooms are built ordinarily of clay, gradually piled up in successive layers and then plastered. The roofs are invariably flat, and are used as sleeping places in the hot weather. In the courtyard is usually seen a manger and a house in which the cattle are sheltered from the cold in the winter months, which structures consist generally of four walls covered with a thatch. As a rule, the houses of the peasantry are built for them by the village carpenter or potter, who receive their food while the work is going on, and presents of clothes or money when the work is finished. The timber used for roofing is usually kikar (*Acacia arabica*) or ber (*zizyphus jujuba*) in the plains, and wild olive in the hills; the first two being usually the produce of the peasant's own fields."

Of furniture, he says:—

"First there are the receptacles for storing grain of various sizes. These are made by the woman of the house of fine clay mixed with chopped straw. Next are to be seen some spinning wheels, an apparatus for churning milk, an instrument for cleaning cotton, a number of circular baskets, with or without lids, made of reeds, in which are kept articles of clothing and odds and ends; trays of reeds used in cleaning grain; a goatskin water bag; a set of wooden measures for grain; a leather bag for carrying flour when away from home; a variety of cooking vessels, some of iron and others of a composition resembling bell-metal; a number of earthern pots and pans, in which are stored grain, condiments, and other articles of food; a coarse iron sieve; a pestle and mortar. These with a few stools and cots complete the list of fittings up to an interior."†

With wood procurable *gratis* on the farm, or from the common, clay in abundance, and straw on the premises, repairs, whether of house or furniture, must, in households such as those described above, cost almost *nil.* The miscellaneous expenses consist chiefly of cost of oil, tobacco,* and occasional sweet meats, so that if we allow an aggregate sum of 2,000,000*l.* per annum on account of repairs and miscellaneous expenses combined, we shall have provided the Punjab agriculturists with all that is necessary for a very comfortable existence.

We have now to consider the several items making up the cost of *cultivation.*

Seed-grain has already been provided for, and so has the *cost of labour*; and the *replenishment of stock* has been already estimated to cost 1,000,000*l.* yearly. As for *feed of cattle*, plough bullocks are, for the most part, fed *gratis* with chopped straw and husks, stubble, crushed surgar-cane, cotton seeds, and other refuse produce of the farm, with the leaves of certain trees, such as the ber (*zizyphus jujuba*), the mulberry, and, in hill districts, the bahera (*terminalia belerica*), and from the grazing on the common on the fallows; but their ordinary food has, at certain seasons of the year, to be supplemented by grown fodder, such as clover, trefoil, turnips, moth (*phaseolus aconitifolius*) and young green crops. The amount of grown fodder given varies in different districts according to the amount of rain-fall and the extent of pasture land available. In the case of the district of Syalkot, a district with a good rain-fall and a fair amount of grazing land, it is estimated by Mr. Prinsep, late Commissioner of Settlements, to amount for well cattle to 200 lbs. weight per annum, costing, at present rates, about 5*s.* Assuming plough cattle, not required for irrigation, to receive half the above amount, and all districts to be similarly situated to Syalkot, the cost of supplementary fodder for cattle used in husbandry would, for the province, be 700,000*l.* But in the drier parts of the Punjab the amount of grown fodder required for the cattle is naturally greater. As an extreme case we may take the district of Dera Ghazi Khan with a rain-fall of about six inches. Here, according to Mr. Fryer,† upwards of one acre in every ten cultivated has to be set apart for growing fodder. At this rate the value of the extra fodder required for the plough and well cattle of the Punjab would amount to 2,200,000*l.* per annum. The real cost for the province must lie somewhere between these two amounts. Bearing in mind the fact that (1) fodder crops are often omitted from the crop returns, and that (2) they are not unfrequently grown intermingled with, or in addition to other crops, we may, perhaps, estimate the amount to be charged in the Punjab cultivator's account for cost of extra fodder at 1,000,000*l.* annually.

The next two items, *repair and renewal of agricultural implements* and *keeping well gear in order*, can be conveniently taken together. With wood, clay, and material for ropes procurable *gratis* from the farm, or on the common, the cost is not heavy, and may be generally resolved into the making of certain customary grain payments to the potter, carpenter, and blacksmith, and the purchase of a little leather

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* The above description applies to the ordinary peasant; some of the better class of villagers and headmen indulge in more expensive custume. In lieu of native cloth, they array themselves in calico from Manchester, with long tight drawers reaching to the ankle, using for turbans and for girdles fine-woven *lunghis* or scarves with ornamental borders. In the cold season they wear outer robes of *pattu*, or of camels' hair, embroidered on the edge and sleeves, or wrappers of fine wool from Hazara, Kulu, or Kashmir; while their ladies, on festal occasions, adorn themselves with veils of spangled muslin, and vests, skirts and trowsers of silk from Bokhara or Khorassan.

† For further information, see Mr. Baden Powell's "Punjab Manufactures" (Lahore 1872), p. 323, *et seq.*

* Tobacco can hardly be considered a necessary of life in the case of the Punjab cultivators, seeing that the most stalwart and healthy of our peasantry—the Jat Sikhs—do not smoke at all; but as they would appear to solace themselves for their deprivation by free indulgence in opium and spirits, it may be as well to admit a moderate amount of tobacco into the recognized dietary of the agriculturists. Judging from the amount of tobacco produced and imported, the value of the tobacco consumed in the Punjab per head of population, exclusive of the Sikhs, must amouut to 9*d.* annually, or if divided amongst adult males, to 2*s.* 6*d.*; but to this must be added 1*s.* 3*d.* as the cost of the molasses with which tobacco for smoking is invariably mixed; but there is undoubtedly a good deal too much of the hookah amongst our cultivators, and if I allow to each adult male an annual expenditure of 3*s.* per head on smoking, I shall be allowing as much as is good for him. The cost of moderate smoking will thus amount in the aggregate to 400,000*l.* out of the 2,000,000*l.* allowed for miscellaneous expenses, leaving a margin of 1,600,000*l.* for oil and other household contingencies and little luxuries.

† Settlement Report of Dera Ghazi Khan, pp. 135–6.

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. *Thornton.*

and iron. Judging from the reports of settlement officers, these charges will be covered, in the case of land irrigated by wells, by about 4*s*., and in the case of other cultivated land, by about 2*s*. 6*d*. per acre annually, the total cost for the province being for well lands 800,000*l*., for other lands 2,200,000*l*., or 3,000,000*l*. in all.

Manure is required for sugar-cane, cotton, Indian corn, poppies, turmeric, tobacco, and garden crops, and is applied to other products also in the vicinity of villages and wells; but, save in the neighbourhood of large towns, it is seldom bought or sold, and the expense of manuring is generally resolvable into cost of carriage and a small grain payment to the village sweeper. The area under crops for which manure is obligatory amounts in the Punjab to about 2,000,000 acres, and the area actually manured may be estimated at double that amount. A lump sum of 600,000*l*. may be allowed to cover this and other farming contingencies, including 180,000*l*. on account of water supplied for irrigation from Government canals.

The total cost of cultivation, exclusive of cost of seed grain, labour, and ordinary feed of cattle, will thus amount on the average to 5,600,000*l*. a year.

Another item remains to be considered, that of *taxes*. Reserving the general subject of taxation for a later stage of our inquiry, it may be here noted that the only indirect tax to be included in the *necessary* expenditure of the agriculturist is the salt tax, for he can exist comfortably without spirits or opium, or fine clothes from Manchester, and this tax has already been included in the cost of food; of direct taxes he has to pay (1), the Imperial land tax, falling at the average rate of 1*s*. 10½*d*. per cultivated acre, and (2), various rates and cesses for defraying the cost of district roads, education, village police, famine insurance, and other local charges, amounting, in the aggregate, to 4½*d*. per acre, the total for the province being, in round numbers—

	£
Land tax - - - - -	2,000,000
Local rates and cesses -	400,000
Total - - -	2,400,000

IV.

Such being the receipts and expenditure of the Punjab agriculturists, their account will stand as follows:—

	£
Value of produce - - -	42,000,000
Deduct—	£
Cost of food - - - - -	15,000,000
Clothing - - - - -	3,000,000
Repairs, tobacco, and miscellaneous household expenses - - -	2,000,000
Cost of cultivation other than cost of labour, seed grain, and ordinary feed of cattle - - -	5,600,000
Land tax and local rates and cesses -	2,400,000
Total -	28,000,000
Balance in favour of agriculturists -	14,000,000

Let us now test the correctness of this calculation by dealing with the matter somewhat more in accordance with reality. Instead of deducing a subsistence rate from the cost of feeding prisoners, let us allow from the produce of the land an amount sufficient for the comfortable subsistence of the peasant population, and see what is the value of the surplus. Again, taking our liberal gaol dietary as the standard of healthy subsistence,* we have the following result:—

	Average Amount produced (after Deduction for Seed) in Lbs. (000,000's omitted).	Required for Food of Agricultural Population (000,000's omitted).	Surplus for Sale in Round Numbers (000,000's omitted).	Value of Surplus at Average Market Rates.
				£
Wheat - - - - - - -	4,960	1,100	3,860	9,650,000
Inferior Grains, viz., Barley, Maize, and Millet - -	4,600	3,390	1,200	2,000,000
Pulses - - - - - - -	1,240	620	600	1,400,000
Meat - - - - - - -	300	165	135	1,200,000
Vegetables - - - - - -	1,200	730	470	300,000
Condiments - - - - - -	100	47	53	420,000
Ghee and Butter-milk - - - -	†128	47	81	2,000,000
Milk and Curds - - - - -	256	160	96	300,000
Tobacco - - - - - -	74	44	30	120,000
				17,390,000

To the value of the surplus produce shown in the above table, we must add—after like deduction for seed—

	£
Value of rice crop - -	3,200,000
„ oil seed - - -	940,000
„ cotton - - -	940,000
„ sugar-cane - -	1,692,000
„ indigo - - -	180,000
„ poppy - - -	50,000
„ miscellaneous - -	1,440,000
„ hides and skins -	800,000
„ wool - - -	800,000
„ of cattle sold - -	1,500,000
„ firewood and timber -	3,500,000
	15,042,000
Making the total value of produce for sale - - - -	32,432,000
Or in round numbers - -	32,000,000

Deducting from this—

	£
(1.) Ten per cent. as the difference between market and village prices -	3,200,000
(2.) Cost of clothing - - -	3,000,000
(3.) Cost of salt, oil, and miscellaneous household expenses - - -	2,000,000
(4.) Cost of cultivation other than cost of seed, labour, and ordinary feed of bullocks - - - -	5,600,000
(5.) Taxes (Imperial and local) -	2,400,000
Total -	16,200,000
We have a balance of - -	15,800,000

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* Although I have taken the gaol dietary as the standard of healthy subsistence for the Punjab population, I do not wish it to be understood that it represents the dietary of the well-to-do classes in all parts of the Punjab; in some localities and by some castes more grain is consumed and less meat, and *vice versâ*. Some few tribes, such as the *Bhabarahs*, wholly abstain from meat; others, especially the Mahomedan tribes on the frontier, consume it in large quantity.

† Exclusive of butter-milk.

Again, let us test our conclusions by another process. In the Punjab the proprietor frequently takes his rent, not in money, but in kind, leaving the tenant cultivator a share of the produce sufficient to support himself and family and cover all expenses of cultivation. If, therefore, we can ascertain the share of the produce left to the most favoured class of cultivating tenants, we shall have another means of gauging the cost of living and cultivation on admittedly comfortable terms. Fortunately this information is available, for among the Punjab Government's statistical returns for 1875–76 is one of great interest and value, entitled "Statement of Tenures not held direct from Government," which gives *inter alia* a return of the proportion of the crop taken by proprietors from all classes of cultivating tenants. From this statement it appears that in the case of the most privileged class of tenants (viz., those with right of occupancy), the proportion left to the tenant is generally two-thirds of the crop, but very often less—in some cases less than half the crop.* We might, therefore, fairly assume the value of two-thirds of the crops of the Punjab as a very liberal provision for all the expenses of its peasantry; but for safety's sake let us go further; let us assume the cost of cultivation and comfortable living to be represented by the value of *three-fourths* † of every class of crop. The average market value of the crops of the Punjab being, as we have seen, 36,000,000*l.*, and their average value to the producer ten per cent. less, or 32,400,000*l.*, three-fourths of this latter sum, or 24,300,000*l.*, will accordingly represent the money value of the share we have assigned for cost of cultivation and subsistence; if to this amount we add the sum of 2,400,000*l.* for taxes (Imperial and local) and deduct the total (26,700,000*l.*) from 42,000,000*l.*, a balance remains of 15,300,000*l.*

We have thus arrived by three different processes at an estimate of the profits of the Punjab agriculturists; the calculation being made in each case on the principle of giving the agriculturists the benefit of every doubt, and avoiding everything approaching to exaggeration of receipts or under-estimating of charges. Of these three processes, one brings out an average profit of 14,000,000*l.*, another of 15,800,000*l.* while the third, which is perhaps the most practical and reliable, an average profit of 15,300,000*l.* We are, therefore, in a position to assert with some confidence that, after liberal provision has been made for the necessary food, clothing, and household expenses of the entire agricultural population, the cost of cultivation and all taxes, Imperial and local, there will remain in ordinary years to the peasant proprietors of the Punjab a balance of profit from the land of *at least* 14,000,000*l.* sterling, a balance available for meeting losses in bad years, payment of interest on loans, and thereafter for expenditure at discretion on English calicoes and other luxuries, improved accommodation, extension of cultivation, and last, not least, upon gold and silver ornaments and marriage feasts.

V.

At this point an English reader may be tempted to remark, "It is all very well to talk about the "agricultural community of the Punjab obtaining a "nett profit from the land of 14,000,000*l.* per annum; "the sum appears large when stated in the lump, "but if divided amongst the agricultural population, "it amounts after all to little more than a profit of 6*l.* "per family."

The criticism is a very natural one; but in estimating the value of this sum to its recipients it is necessary to remember that in a society where a pair of shoes can be bought for 9*d.*, a suit of clothes for 3*s.* 3*d.*, where meat costs 2*d.* and flour a halfpenny a pound, a plough 5*s.* and a harrow 10*d.*, and where other articles of ordinary use are proportionately cheap, a profit of 6*l.* is equivalent to a profit of at least 60*l.* in England. How many English peasants save 60*l.* a year?

Another point has to be borne in mind, namely, that our calculation of the profits of the agriculturist has been made on the supposition that grain is fairly cheap; but should it happen, as it has not unfrequently happened of late years, that the price of produce rises, not from failure of the local harvest, but in consequence of extensive exports, then the cultivator's profits increase rapidly. If grain produce rise in price by as little as one seer (2 lbs.) in the rupee, he gains, in the case of wheat, an additional profit of 1*s.* 3*d.* on every acre's produce sold, and in the event of a general rise to that amount the agricultural community of the Punjab is richer by 500,000*l.* Of course in a country like the Punjab, dependent for more than two-thirds of its agricultural produce upon a very uncertain rain-fall, the reverse process not unfrequently takes place; but owing, it may be presumed, to the steady improvement of our communications, the *general* tendency of prices for the last 20 years has been to *rise.**

But we have not yet finished with the income of the agriculturists. Besides the profits realized from the land, the cultivating proprietor or tenant makes no inconsiderable gain from hiring out his cart in the slack season for transport of goods or merchandise, while agricultural labourers earn large sums by working on canals, railways, and other public works. At the present moment large numbers of the peasants are receiving as much as 9*d.* a day for earth-work.

Then many a peasant has a son or brother or other member of his family in the service of the Government as sepoy, policeman, or revenue official, or employed upon the railway, who contributes from his earnings to the common stock; some 200,000 hold the office of village headman, receiving a commission of five per cent. on all taxes they collect, while not a few of our peasant proprietors are the happy possessors of a plot of revenue free land.

Lastly, should any peasant proprietor desire to improve his holding, to increase his income by sinking a well, constructing an embankment, or other work of permanent utility, he can obtain a loan from Government at six per cent. per annum.

But here a political economist will perhaps offer a remark: "Granted that profits from the land "in the Punjab may amount to a considerable sum, "pray, how is the amount distributed? For it is "possible to have a wealthy landed interest side by "side with an impoverished agricultural popula-"tion."

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* The following are the details:

Of tenants paying rent in kind there are—

I. Tenants-at-will—	
(1.) Paying ½ produce and more - -	295,273
(2.) " less than ½ produce - -	230,465
II. Tenants with right of occupancy—	
(1.) Paying ½ produce and more - -	41,248
(2.) " ⅓ produce and less than ½ produce	47,588
(3.) " ¼ " " ⅓ "	25,408
(4.) " ½ " " ¼ "	9,286

† The liberality of this assumption may be measured by the fact that in Italy, where the standard of living and cost of cultivation are, from climatic and other reasons, far higher than in the Punjab, the share of the produce left to the *metayer* tenant is usually *one-half*—in Tuscany as little as *one-third*. In Northern Russia, where the soil is far from rich, while the cost of living and cultivation is greatly enhanced by the rigours of the climate, the *metayer* tenant retains, according to Huxthausen, only half the produce. In the Native States of the Punjab the share of the produce left to the cultivator, is, as a rule, far less than in British territory.

* Take, for instance, the price of wheat; from 1858 to 1861 it rose steadily from 41 lbs. a shilling to 18 lbs. a shilling; from 1861 to 1863 it fell, but only to 31 lbs.; from 1863 to 1869 it rose steadily to 14½ lbs.; between 1869 and 1876 it again fell, but only to 25 lbs.; in 1877 it again rose. But the tendency of prices to rise, irrespective of the effects of drought, is better exemplified in the case of crops usually requiring irrigation, and thus more or less independent of rain, such as rice, sugar, and cotton. The price of rice has risen with inconsiderable fluctuations from 17½ lbs. a shilling in 1857 to 9 lbs. a shilling in 1877, or nearly 100 per cent.; of unrefined sugar from 14 lbs. a shilling to 11 lbs. a shilling, or by 20 per cent.; cotton steadily from 4 lbs. a shilling to 3 lbs., or 25 per cent., except during 1863–64, when it rose to 2½ lbs. a shilling. Meanwhile, be it remembered, the land tax has been almost stationary.

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To this very pertinent inquiry I can reply, on the authority of the tenure statement above referred to, that the profits are as widely distributed as they well can be with benefit to the community. In the Punjab there are no millionaire proprietors; indeed, there are but nine individuals in the whole province whose land tax exceeds 500*l.* per annum. Of the entire agricultural population—

- 2,000,000 are proprietors of land in common or in severalty, with an average holding of 13 acres of cultivated and fallow land, exclusive of rights in the uncultivated area, the proprietor, as a rule, cultivating seven acres himself, and letting the remainder to tenants on the *metayer* system;
- 500,000 are tenants with right of occupancy, with holdings averaging six acres;
- 1,200,000 are tenants-at-will, with holdings slightly smaller;

and the rest of the agricultural population is composed of the families of the above-mentioned classes, and a limited number of farm-labourers. As a rule, the produce of six acres will support an agricultural family in comfort. In a community so constituted the benefit of any general increase of wealth derived from land, whether owing to rise of price or the introduction of more valuable staples, is felt not by a few great capitalists only, but by almost every member of the agricultural population.

But here it may be urged, by some new critic, fresh from the pages of the *Nineteenth Century*: "Granted "that your peasants may realise great profits, and that "these profits are theoretically well distributed, is it not "true that they are all pledged to the village banker? "And is it not the case that the ancestral lands of the "peasant population are passing with terrible rapidity "from the possession of the hereditary owners into the "hands of the money-lending class?"

To this important question a complete answer can fortunately be given. Those who require a reply in detail will find it in the published Administration Reports of the Punjab Government for the last four years. In this place it will suffice to mention the principal facts which those reports record. It is there shown that of the cultivated area of the province comprising, with fallows, 25,000,000 acres, less than one-fourteenth part is under mortgage—no less than 23,240,000 acres being unencumbered;[*] that the number of suits for debt against the agriculturists of the Punjab is far less in proportion to population than the number of debt-suits in England; for while in the Punjab one agriculturist out of 110 is annually sued for debt, in England one person out of 22 has yearly to undergo that unpleasant operation; that transfers of agricultural land, so far from being alarmingly frequent, are, in proportion to the extent of acreage, singularly few and unimportant; the sale of ancestral land by decree of court being, indeed, almost unknown, while, in spite of tempting prices, the amount transferred by private sale is less than one acre per annum per square mile of assessed area, of which by-the-bye, the greater portion passes into the hands, not of money-lenders, but of agriculturists; that the average selling price of land has risen steadily from four years' purchase of the land revenue demand in 1859 to *thirty years'* purchase in 1876–77, and that nearly the same amount can be raised by mortgage as can be raised by sale.[†] It is shown, in short, by statistics procured from every district in the province, that the peasant proprietors of the Punjab, so far from being, as a body, insolvent or oppressed with debt, are eminently prosperous; being not only, as we have already seen, the recipients of an average surplus income of at least fourteen millions sterling, but blest with an available, but unused, credit at their bankers for nearly sixty millions more.

What, then, it may be asked, is the practical and visible result of this agreeable state of things? The result it may be answered, can be seen in the steady increase of cultivation which has taken place of late years in the Punjab; the extension of the irrigated area by means of private capital, the increased production of more valuable crops, the gradual substitution of masonry dwellings for mud huts, of brass for earthen vessels, in increased expenditure on silks and metals, in large consumption of goods from Manchester,[*] in decreasing applications for loans from Government, and in the general contentment, loyalty, and thriving aspect of the population. It is seen also in the fact that, notwithstanding a large export of grain in 1876, the markets were so overflowing that there was danger of a glut; that, in spite of a total failure of the autumn harvest of 1877, there was no general distress in the Punjab, and that, after an export of 400,000 tons of grain in 1877–78, wheat was selling at 15 lbs. a shilling.

A word regarding *taxation.* The Imperial and provincial revenues and receipts of the Punjab amounted in 1876–77 to 3,630,000*l.*; adding to this amount 200,000*l.* on account of sea customs duty collected at the ports on articles consumed or used by the people of the province, and deducting, on the other hand, the following items:—28,000*l.* paid as tribute by Native States; 80,000*l.*, sugar export duties, paid by foreign consumers, 130,000*l.* postal receipts, a reasonable charge for service immediately rendered; 160,000*l.* canal water rate, an optional payment for an article supplied; 90,000*l.* forest receipts, and 55,000*l.* gaol receipts, proceeds of goods sold or labour supplied, and 41,000*l.* fines for criminal offences, we have the following result, viz., that the sum taken by the State from the pockets of the people for general purposes of administration amounted, according to latest information, to 3,246,000*l.*, falling at the rate of 3*s.* 3½*d.* per head of population. If to this be added 400,000*l.* on account of local rates and cesses, the sum total of Imperial and local taxation combined will not exceed 3,646,000*l.*, falling at the rate per head of only 3*s.* 8¼*d.*

After what has been said above, it is hardly necessary to observe that the weight of taxation in the Punjab, even in the case of the agricultural population, who pay the lion's share, is anything but "crushing." The indirect taxes, salt, excise, and customs, are included in the cost of living and paid insensibly; the land tax[†] which in Sikh times varied from one-half to one-third, is now nominally one-sixth, but practically about one-sixteenth of the value of the produce. Moreover, in Sikh times, stock and dairy produce was taxed, and sometimes heavily; it is now practically untaxed, for the assessment of grazing lands is nominal.[‡] As for local rates and cesses I can perhaps best indicate their lightness by stating that the ordinary cultivator can defray them all, including Sir John Strachey's famine insurance rate,—and improve his constitution into the bargain,—by reducing his smoking to three pipes a day, or, if he be a Sikh cultivator who does not smoke, by a slight reduction in the amount of his potations or of his daily allowance of opium or post.* But while the pressure of the local taxes is thus hardly felt, the benefits derived from them are immense, though not always as much valued as they ought to be. From local taxation the cultivator is provided with roads to his market, which he thoroughly appreciates; postal communication with the headquarters of the district and the Imperial postal lines, which he is beginning to appreciate; and education for his children,—which I fear he does not as yet appreciate at all. He is provided, besides, with a hospital within reach, a watchman, and the services of a surveyor and accountant.

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[*] Compare with this the situation in England, where, according to Mr. Laveleye, mortgages amount to 58 per cent. of the value of the land, and in Lombardy, where they amount to 25 per. cent.; even in France, the paradise of peasant proprietors, one-tenth of the land is said to be under hypothecation.

[†] In Flanders, says Mr. Laveleye, the selling price of land has doubled since 1830. "These results," he adds, "are not equalled in any other part of Europe." In the Punjab the selling price of land has more than trebled in less than half the time. In 1864 it averaged 11*s.* an acre; it now averages nearly 40*s.*

[*] See Appendix.

[†] For brevity's sake I have used the word land tax to denote the Government revenue derived from land; but, as frequently pointed out, the land-revenue of India is not really a tax any more than the revenue of Crown lands in England is a tax. It is the portion of the rent taken by the State in virtue of its position as proprietor in chief of the soil—a position inherited by the British Government from its predecessors, the Moghul Emperors, and held by it in common with every Eastern potentate. But even if it be regarded as a tax, it is, in the Punjab, a very light one, as will be seen from the succeeding note.

[‡] As some critic may complain of my going back to Sikh times for a standard of comparison, I venture to give a few examples of the rate of the land tax in civilized countries at the present time. In Italy, according to a writer in the *Spectator* for the 16th November 1878, the landowners have to pay a tax on their *prediali* amounting on the average to thirty per cent. of their incomes—the proportion being, in some cases, more than forty per cent. According to Mr. Zincke's article in the *Fortnightly* for November, the peasant proprietor

But another objector may arise and say, "It is all "very well to prove statistically that the peasantry of "the Punjab are lightly taxed and prosperous, but "your statements are so *very* satisfactory that you must "pardon me for doubting their correctness. Have "you seen, with your own eyes, the prosperity you so "logically describe?"

To this direct appeal, if made, I can reply as follows: "I know every district in the Punjab. I "have watched its progress with deep interest for many "years, and from many points of view—as a judicial, "as an executive, as an administrative officer,—and I "know that my story, though widely different from "Mr. Hyndman's, is substantially correct. I do not, of "course, claim for the Punjab the attributes of Para- "dise. There, as in more favoured regions, are to be "found some cases of depression and distress; there, as "elsewhere, the people have their grievances, and vast, "indeed, is the room for progress and improvement; "there are villages which suffer from over-population; "there are villages which suffer from over-irrigation; "some villages there may be, but very few, in which "the land tax presses; there, as elsewhere in India, "inundations, cattle disease, locusts do their work "of destruction; and epidemic disease, in the shape "of cholera and the *cohors febrium*, is not unknown. "Then as to grievances, there are grievances about "forest conservancy (a form of civilization not appre- "ciated by the people), grievances about canal water "supply (especially in the matter of having to pay for "it), grievances about grazing lands, grievances about "sanitary laws; moreover, though, as a body, the "peasantry are flourishing, there are, doubtless, indi- "vidual cases of embarrassment; and, in the event of "a failure of the harvests, there is a residuum of the "agricultural population, possessing little or no land, "which readily succumbs. But the cases of distress "are exceptional, and the grievances are not serious, "and, take it all in all, I venture to assert with confi- "dence that Her Majesty has few subjects more "well-to-do (in their small way), few more contented, "few more well affected, than the peasant cultivators "of the Punjab."

"If specific instances of visible improvement are required, they can be given in abundance. In the year 1858 I visited the battle field of Chillianwallah. There was then but little cultivation, and the eye wandered for miles and miles over an expanse of dreary jungle. In the spring of 1870 I again visited the locality in the suite of the late Lord Mayo. The scene was completely changed. The dreary jungle had become a sheet of cultivation interspersed with groves of trees. So great, indeed, was the transformation that an officer on the staff, who had been present at the battle, failed to recognize a single feature in the landscape. Again, when marching through the Multan district a few years ago, I had the good fortune to be accompanied by an English officer who had been employed in that part of the Punjab since 1850. As we proceeded deputations of well-dressed villagers came out to welcome us, many of them mounted on excellent horses, with velvet-covered saddles and gold and silver trappings. 'How different was the scene,' observed my companion, 'when I went 'over this ground in 1850. In those days every 'village seemed in the last stage of poverty, even the 'headmen being scantily clothed in the coarsest cloth. 'As for horses, such a thing was not to be seen, and 'if, here and there, we met with a mounted headman, 'he was mounted, not on a caparisoned steed, but on 'the bare back of a half-starved pony, with a bit of 'old rope doing duty for a bridle.' Again, in Yusafzai, on the Peshawar border, I traversed during 1865 miles and miles of *maira*, or uncultivated waste, all of which is now under the plough; indeed so far back as 1870, the officers of the Guide Corps were bitterly complaining of the disappearance of the florican, and the curtailment of the hunting grounds owing to the rapid increase of cultivation. Again, on the western frontier, I have frequently seen villages surrounded with waving crops, extending for miles up to the extreme limit of British territory, and have been assured that, 20 years ago, all beyond matchlock-range of the hamlet was uncultivated and desolate. Many are the other instances I could give of visible improvement in the circumstances of the Punjab cultivators during the last 20 years, but space and time, and respect for the patience of my readers prevent my pursuing this agreeable subject further."

So much for the past and present—one word as to the future of the province. Of land comprised within the surveyed boundaries of villages, there are upwards of ten millions of culturable acres as yet untilled; should these be brought under the plough or otherwise fully utilized, or should individual villages desire relief from over-population, there are nine millions of acres of culturable waste at the disposal of the State available for the formation of new settlements; and out of these nine million acres, more than two millions have water within irrigable distance from the surface of the soil. In addition, moreover, to these culturable acres, there are tens of millions of acres now unculturable, but destined to become of immense value when the waters of the Indus, the Jhelam, and the Chenab shall have been brought to fertilize the almost rainless tracts on the west and south of the Punjab. With a large area for extension of cultivation, a fairly fertile soil, great capabilities for irrigation, an increasing population, a growing trade, and a railway to its natural port, Kurrachee—the future of the Punjab is one of abundant promise.

VII.

Before concluding, I must notice another count in Mr. Hyndman's general indictment. He asserts that the productive power of the soil of India is and has been steadily deteriorating. This *may* be the case; indeed theorists contend that it *must* be the case; but I have seen no evidence worth a moment's consideration that it really *is* the case. Of course, it is possible to produce instances here and there of lands exhausted by over-cropping, or defertilized by over-irrigation, but

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in the Limagne pays for house and lands comprising 6 *hectares* or 15 acres, taxes to the amount of 6*l.*, or 8*s.* an acre, yearly, besides 3*d.* on every bottle of home-made wine he sells. If comparison be made between the Punjab and Native States, the difference in favour of the Punjab cultivator is striking. In Cashmere the recent cash settlement was made on the principle of the State being entitled to the value of sixty-three per cent. of the gross produce. In Bhawalpore, which is being temporarily administered by British officers, the taxation, after being immensely reduced under our auspices, falls at the rate of 8*s.* per head of population. In Egypt, according to Mr. McCoan, the land tax falls, in the case of ordinary tenures, at the rate of 22*s.* per acre.

* An ordinary cultivator, with a holding of six acres, pays in local rates and cesses about 2*s.* 4*d.* annually; but, as we have already seen, he expends 3*s.* 9*d.* on his *hookah*, which he smokes, on an average, nine times a day. A Sikh cultivator will not unfrequently expend annually on spirits or opium, or both, a sum sufficient to pay, not only his local taxes, but a large portion of his land tax in addition. The superior sturdiness and vigour of the Sikh cultivator, who drinks freely, but does not smoke, as compared with the Mahomedan cultivator, who smokes freely, but does not drink, is certainly a "fact" for the Anti-tobacco Association. *Post* is a decoction from the poppy, much favoured by Sikhs, especially of the Cis-Sutlej districts.

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of *general* deterioration of the soil in the Punjab, there is, to the best of my knowledge and belief, no proof whatever deserving of the name. Meanwhile, I can mention, on the high authority of the present Lieutenant-Governor of the province, a fact which hardly favours such a supposition, namely, that the average yield of wheat in unmanured land in the Punjab, as ascertained by a series of experiments, is *greater* than the average yield of wheat in unmanured land in England—the former being 880 lbs. per acre, the latter 843 lbs. only.

VIII.

To sum up;—my answer to Mr. Hyndman's general indictment is, in the case of the agriculturists of the Punjab, that he has greatly under-estimated their income; that he has greatly over-estimated their cost of living; that he has assumed a general impoverishment that does not exist; and a general deterioration of the soil that is not proved; that the peasant population of the Punjab, so far from being on the road to bankruptcy and ruin, are on the high road to increased prosperity and wealth.

T. H. Thornton.

Calcutta, January 1879.

Appendix.

In support of my statements made regarding the prosperous condition of the Punjab peasantry, I subjoin a few statistics taken from official reports and returns:—

1. *Increase of cultivation.*—Returns of cultivated area in the Punjab are prepared every five years, the first published being that for the year 1868–69.

The Return for 1868–69 gives the cultivated area of the province as 20,171,558 acres.

The Return for 1873–74 gives it as 22,640,889 acres.

Thus the cultivated area of the province was increased in five years by nearly two and a half millions of acres; or, to put the matter more familiarly, a new tract of country was brought under the plough equal to five counties of the size of Surrey.

2. *Extension of irrigation by means of private capital.*—The statistics of irrigated area are also prepared quinquennially. The Returns for 1868–69 and 1873–74 give the following information:—

—	1868–69.	1873–74.	Increase.
AREA IRRIGATED.	Acres.	Acres.	Acres.
(1.) By Government canals -	1,372,987	1,618,854	245,867
(2.) By private works (*i.e.*, by wells, watercourses, or canals constructed by or at the expense of agriculturists).	4,611,904	5,000,481	388,577
TOTAL - -	5,984,891	6,619,335	634,444

Thus between 1868–69 and 1873–74 the irrigated area was increased by means of private capital to the extent of 388,577 acres, or 607 square miles. In other words, in the space of five years the peasant cultivators of the Punjab brought under irrigation, and thus secured from drought, at their own expense, a tract of country twice the size of Middlesex; or, to put the matter still more strikingly, they brought under irrigation in five years an area greater than that watered by the *Bari Doab* Canal; a work which has been upwards of twenty years under construction and has already cost nearly 1,500,000*l.* sterling.

3. *Increased cultivation of the more valuable crops.*—Returns of the principal crops of the Punjab are published annually; from these returns I have compiled the subjoined statement showing the development of the cultivation of the following staples, *wheat, oil seeds, sugar-cane,* and *indigo,* between 1868–69 and 1876–77.

—	1868–69.	1869–70.	1870–71.	1871–72.	1872–73.	1873–74.	1874–75.	1875–76.	1876–77.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
Wheat - -	5,577,005	5,654,637	5,402,473	5,366,977	5,716,867	5,820,861	6,025,771	6,282,687	6,609,497
Oil seeds - -	439,155	462,430	610,416	540,140	638,905	722,648	739,167	838,794	846,689
Sugar-cane - -	325,831	342,605	370 195	333,657	372,824	374,125	297,136	383,029	391,630
Indigo - -	32,444	82,039	61,439	67,736	72,674	89,959	118,815	84,333	129,465

Thus the cultivation of wheat and sugar-cane has increased in nine years by about 20 per cent., that of oil seeds has nearly doubled, and that of indigo quadrupled. It may be added that the area under tea has increased from 5,521 acres in 1868–69 to 10,046 acres at the present time.

4. *The gradual substitution of masonry dwellings for mud huts* cannot, unfortunately, be proved by statistics, but it is a matter of common observation; the substitution of *metal for earthen vessels,* and I may add of imported steel for native iron in the manufacture of plough shares, is not only a matter of observation, but is evidenced by the increase which has taken place of late years in the amount and value of metals, and metal manufactures imported. *See* next paragraph.

5. *Increased expenditure on silks and metals, and large consumption of goods from Manchester.*

The following statements compiled from the Punjab trade returns will be of interest. It is to be regretted that the information cannot be given from an earlier date, but, unfortunately, arrangements for registering the trade of the province were not completed until 1873–74.

(1.) *Metals and metal manufactures* (exclusive of railway material, machinery, and bullion).

YEAR.	IMPORTS.		EXPORTS.	
	Weight in Maunds of 80 lbs.	Value in £s.	Weight in Maunds of 80 lbs.	Value in £s.
		£		£
1874–75 -	177,378	255,843	44,831	67,163
1876–77 -	265,939	355,661	52,265	85,073

(2.) *Silk and Silk goods.*

YEAR.	IMPORTS.		EXPORTS.	
	Weight in Maunds of 80 lbs.	Value in £s. at 50*l.* a Maund.	Weight in Maunds of 80 lbs.	Value at 50*l.* a Maund.
		£		£
1874–75 -	10,311	515,550	Returns incorrect.	Returns incorrect.
1876–77 -	10,953	547,650	3,735	186,750

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(3.) *Piece goods (European).*

YEAR.	IMPORTS.		EXPORTS.	
	Weight in Maunds 80 lbs.	Value at 12*l.* a Maund.	Weight in Maunds.	Value at 12*l.* a Maund.
		£		£
1874–75 -	341,474	4,097,688	61,711	740,622
1876–77 -	353,964	4,247,568	78,212	938,544

From the third of the above tables it will be perceived that the value of the cotton goods from Europe, imported into the Punjab for home consumption, amounts (at 12*l.* a maund, a rate of valuation fixed by the Punjab authorities after very careful inquiry) to about 3,300,000*l.* annually. Deducting from this sum 20 per cent. for cost of carriage and dealers' profits, the balance, 2,640,000*l.*, will represent the seaport values of the goods consumed in the Punjab. But the total value of cotton goods imported into India amounts, after deduction of re-exports, to 18,000,000*l.* annually. It would therefore appear that, in spite of remoteness from the sea-board, the Punjab, with a population equal to about one-thirteenth of the population of India, consumes upwards of one-seventh of the cotton goods imported. The returns for 1877–78, just received, show a falling off in the piece goods trade, but this was to be expected in view of the almost total failure of the autumn rain crop of 1877, and the depressed state of trade with Cabul and adjacent countries.

Note on Mr. Thornton's criticism on Mr. Hyndman's Article.

Mr. Elliott.

1. *Mr. Thornton's method.*—Mr. Thornton has confined himself to the consideration of the economic condition of the agricultural population of the Punjab, leaving the non-agricultural population to be dealt with in another paper. He has calculated the produce raised by them, their necessary consumption, and the surplus remaining for comfort or luxury; and he has made this calculation in two ways: first, assuming that they sell everything which they raise and buy everything which they consume; second, assuming that they consume what they require of their home-raised crop, and sell the surplus.

2. *The census figure for "Agriculturists" questioned.*—The first datum required for such a calculation is the number of the agricultural population, and this figure Mr. Thornton has taken from the census report. I venture to think that the census statistics can hardly be trusted implicitly in such a matter as this. According to them, the agricultural population was 55 per cent. of the total, or 9,683,000 out of 17,611,000; and Mr. Thornton has assumed that since the census was taken in 1868 the population has increased to 20 millions (an increase of 13·5 per cent.). and the agricultural to 11 millions (an increase of 13·6 per cent.). This assumption is extremely doubtful; but it is not my present purpose to enter in that subject. The urban population of the Punjab was 1,972,000, leaving the rural population at 15,639,000, of whom only 9,683,000 are engaged in agricultural pursuits; so that if the census statistics may be trusted, there are 6 millions of people living in the Punjab villages who neither own land nor cultivate it, nor labour on it for wages. Surely the experience of those who have been long engaged in district work, and who know how few people there are in the villages who are unconnected with the land, would lead them to suspect that there must be some error here.

3. *Comparison with the statement of landed tenures.*—The suspicion is strengthened by an examination of the census figures. Those who are returned as agriculturists are divided among the following classes:—

Proprietors - - - -	5,876,067
Tenants - - - -	3,245,469
Labourers - - - -	318,845
Shepherds - - -	109,585
Graziers - - -	57,429
Herdsmen - - - -	76,169

To these, at any rate, should have been added the jaghirdars, 46,408 in number, who are only proprietors under another name.

But the statement of landed tenures for the Punjab, drawn up for the year 1875–76, gives the following figures:—

Proprietors or shareholders in estates	2,445,018
Tenants (number of holdings) - -	1,677,486

What do these figures represent? If the same procedure is followed in the Punjab as in the North-Western Provinces, in regard to the record of proprietors, the name of the head of the family only is entered while he is alive, but if he dies leaving a widow and children the names of all of these are entered; so that the 2,445,018 cannot stand for heads of families, but for some smaller figure, and should perhaps be multiplied by $2\frac{1}{2}$ to obtain the population it represents. On this hypothesis the proprietory population is 6,110,000, or say 6 millions. But the number of tenants' holdings represents in most cases an entire family: their average area is 6 cultivated acres, which can hardly be tilled by less than one adult male, assisted by his family, and thus the tenant population would be $4\frac{1}{4} \times 1,667,000$, or 7,127,000. Add to these the 562,000 labourers, shepherds, &c., of the census and we have an agricultural population of 13,800,000, or nearly 90 per cent. of the rural population. This is the same proportion as I have arrived at in a separate calculation as the true percentage in the North-Western Povinces.

4. *Numbers classified as non-agriculturists, but engaged in agricultural pursuits.*—There is another way of considering the question. Mr. Thornton has included, among articles raised by the agricultural population, milk and its products, wool and hair, hides and skins, meat, animals for draught or dairy purposes, and timber for building and fuel. Now it is obvious that many of these articles are raised by other classes than those enumerated in the census among the agricultural population. Among the non-agriculturists I find milkmen who must probably have something to do with raising as well as selling milk; butchers who breed cattle for slaughter as well as buy them; carpenters, woodsellers, and charcoal-sellers who cut as well as sell timber and fuel; tanners or chamars who strip the hides off dead cattle without any reference or remuneration to the late owner, the agriculturist. All these ought to be added to the agricultural classes, if the value of their wares is to be entered as an agricultural product; besides which it is well known that there is a vast number of people who combine agriculture with some other profession. Blacksmiths, masons, carpenters, potters, barbers, washermen, salt and saltpetre makers, oil pressers, grain-dealers, and grain-parchers, weavers, petty shopkeepers, priests and pandits—all these, besides their special hereditary profession, very often own or cultivate a little bit of land, and thus swell the list of tenants in the statement of landed tenures. But I have dwelt sufficiently on this subject in my note on the agricultural population of the North-Western Provinces, which I propose to submit to Mr. Thornton for his consideration, as an appendix to these remarks.

5. *Suggestion as to true figures for agricultural population.*—On the whole, then, I should be inclined

to suggest that the proper classification of the Punjab population of 1868 would be somewhat on this wise:—

Urban	1,972,000
Rural—engaged in agriculture only	10,000,000
engaged partly in agriculture and partly in trade	3,800,000
non-agricultural	1,800,000

If any such hypothetical allowance is to be made for the supposed increase of population since 1868, as Mr. Thornton has made, then the agricultural population (including those partly engaged in trade) should be raised to 15,600,000.

6. *Difficulty of separating agriculturists from non-agriculturists.*—But the very fact that there does undoubtedly exist in every province of India such a mixed class as I have described seems to me fatal to the possibilty of arriving at the truth by the method Mr. Thornton has adopted. We cannot separate the agricultural population in any such distinct way as he has done from the non-agricultural so as to be able to say: this is the value of the articles produced by such a class, and, deducting their consumption, there is so much surplus. If we attempt this, we either fall into the error which I venture to think Mr. Thornton has fallen into, and attribute to 11 millions the products raised by the labour (at least the partial labour) of 15 millions; or we should fall into the opposite error, and assume that the 15 millions produced nothing but agricultural produce, whereas a certain number of them also earn part of their livelihood by their trade as weavers, carpenters, smiths, &c.

7. *Another method suggested. Classification into rural and urban.*—A truer hypothesis would perhaps be that all the rural population live off the products of the land, exchanging their wares among each other by a simple process of customary barter without any need of coin. The agriculturist does not, I submit, pay to the leather-worker 400,000*l.* a year for his shoes; he gives the chamar the hides of dead cattle free; he gets as many shoes from him as he wants, and he pays him by a fixed quantity of grain at harvest-time. The carpenter and smith are paid in the same way for making and repairing agricultural implements; the village weaves makes clothes, and the shepherd weaves blankets; the washerman and the potter work for the village in which they were born, and their fathers worked on the same terms, that is, payment of a fixed quantity of grain per plough, or per house, or per acre, or per well, as the custom may be. All these are fed off the land; they rarely save anything; their wage is practically the measure of their consumption. They are dependents and hangers-on of the agriculturist, and he on his part has no occasion to pay for clothes, for house repairs, for field implements, or house utensils, any more than if he grew them. The whole rural population may thus be taken as homogeneous, all its ordinary wants being supplied from the land. The only true class-distinction that can be drawn is, I conceive, that between the urban and the rural population. To the town goes the surplus food-grain and almost all the non-food-produce of the land, by the sale of which the agriculturist pays his rent or revenue and buys his luxuries—English cloth, refined sugar, spices and salt, and so forth. Of course this assumption is not absolutely correct any more than the other; the town population comprises a few who are actually agriculturists and till the lands surrounding the town, and still more who are the dependents of agriculturists, weaving and working for them in return, not for a price, but for a customary fee, just as the village artizans do. But, on the whole, it seems to me safe to say that the great majority of townspeople either live on their rents and private incomes, or else live by trades which mainly consist in exporting the surplus raw produce of the country, and in retailing to the rural population the finer articles of use and luxury which the villages cannot produce.

8. *Application of this method.*—I think, then, that a fairly correct estimate of produce, consumption, and surplus can be made on this assumption; and I propose to draw out the calculation accordingly, following as far as possible Mr. Thornton's method, except in a few details where I shall offer reasons for adopting a different conclusion from his. Accepting Mr. Thornton's hypothesis that the population has increased to 20 millions (though, as I have said, it appears to me a very doubtful one), the urban population will be 2 millions, the rural 18.

9. *Food crops.*—Mr. Thornton states the main agricultural products of an average year thus:—

	Acres.	Rate of production per acre.	Outturn in tons.	Value in rupees.
Food crops -	17,535,000	691 lbs.	5,412,500	—
Non-food crops -	3,465,000	Rs. 21–10	—	7,50,00,000

Major Wace, in the reply to the Famine Commission drawn up by him on the basis of the latest information and statistics possessed by the Financial Commissioner's office, gives the following figures:—

	Acres.	Rate per Acre.	Outturn in tons.
Food crops -	18,500,000	644 lbs.	5,488,240
Non-food crops -	2,600,000		

With regard to the food crops, it is perhaps best to accept Major Wace's figures as being specially prepared by an expert, with an express view to the discussion of this subject; whereas Mr. Thornton's figures were apparently taken from Administration Reports and, though official, had been less carefully considered. Major Wace gives no estimate of the value of non-food crops. Mr. Thornton's estimate comes to Rs. 21–10 per acre, or Rs. 56,160,000 in all; and this seems to me low. I shall make some remarks on the details as they come under discussion in the course of this note.

10. The next point is, the quantity consumed for food. Mr. Thornton's estimate (derived apparently from the jail ration) of the annual quantity consumed per head on an average of the whole rural population is as follows:—

Dry grain, including pulses -	465 lbs.
Meat -	15 „
Vegetables -	66 „
Spices and condiments -	4¼ „
Ghi and buttermilk -	4¼ „
Milk and curds -	15 „
Tobacco -	4 „

The estimate of 465 lbs. of dry grain seems to me rather low when it is considered—(1) that there is loss on all grains and much loss in the case of the smaller millets in converting them to flour; (2) that a great portion of the rural population are engaged in hard work in the open air, and are therefore always hungry, and are well enough off to satisfy their appetites; (3) that the Punjabi is generally a big man, and eats more than an average Hindustani; but it agrees closely with the calculation of Major Wace and the Punjab Government, which place the consumption at 20 oz. per head per diem; and I do not therefore propose to raise it. The quantity consumed by the 18 millions will at this rate be 3,736,000 tons. The seed-grain is calculated by Major Wace to be 402,000 tons. The loss by wastage and dryage is estimated at 5 per cent. on the total produce, or 274,400. The consumption by cattle is a point on which very little is known with exactitude. Major Wace remarks on it as follows:—

"The agriculturists do not usually feed their cattle with grain, but the townspeople do, to a certain extent, especially their cows. The drivers of bullock carts always feed their cattle with two or three seers of grain, when working. Bullocks, ponies, and mules are similarly fed when carrying pack-loads. And there is a certain very limited consumption in feeding up cattle and sheep for slaughter. It is difficult to put the consumption, under these various heads, as less than 6,000,000 maunds per annum, of which two-thirds is consumed by draught and pack cattle."

This calculation must be accepted for want of a better; but as part of the cattle thus fed belong, as already mentioned, to townspeople, I roughly set down the consumption of the rural cattle at 5,000,000 maunds, or 183,800 tons. The account with the dry grain or food-crop produce will therefore stand thus:—

		Tons.
Total outturn - - - -		5,488,240
Deduct—		
	Tons.	
Food of people - -	3,736,000	
„ of cattle -	183,800	
Seed-grain - -	402,000	
Wastage - -	274,400	
		4,596,200
Surplus - - - -		892,000

The value of this surplus, taken at Mr. Thornton's average market rate, or Rs. 58 per ton, is Rs. 5,17,36,000.

The surplus is accounted for thus:—

	Tons.
Food of the urban population at the same rate as the rural -	415,000
Food of cattle belonging to them	36,700
Average exports - - -	166,000
	617,700

leaving a difference of 275,000 tons unaccounted for. This is not a large quantity out of so vast a sum total as we are dealing with, being only 5 per cent. Moreover, the consumption of the townspeople has been reckoned as only equal to that of the villagers, whereas it is known to be considerably greater. In the North-Western Provinces it is estimated at 7 maunds a head, or 500,000 tons for the urban population. Allowing a margin for slight errors, the value of the surplus crops to the rural population may be set down as fifty millions of rupees.

11. *Meat.*—The next item in Mr. Thornton's list is meat. Under the conditions of the problem as now put, we need not enter into the value of the meat raised and consumed by the rural population; we have only to do with what they sell to the townspeople. Mr. Thornton calculates that these latter consume 15 lbs. a head per annum, and that it costs them 2*d.* per lb. Then, the 2 million townspeople consume 30 million lbs. of meat, most, though not quite all, of which they buy from the rural population, and they pay for it 2½ million rupees. But a large portion of this is the price paid for the butcher's labour. The actual price paid to the grower* is probably about two-thirds of the price of the meat; so that the rural population can only be credited with 1⅔ million of rupees as the money-proceeds of the cattle they sell for slaughter.

12. *Vegetables.*—Mr. Thornton's paper gives the area cultivated with garden vegetables as 200,000 acres; the average crop as 6,000 lbs. or 75 maunds per acre, and the value as Rs. 40. Major Wace gives the area as 250,000 acres, but he adds no estimate of produce. Mr. Thornton's estimate of produce seems to me rather large. In the North-Western Provinces, where the cultivation is, generally speaking, higher than in the Punjab, Mr. Buck puts it at 50 maunds, except in the case of potatoes, for which he allows 100 maunds per acre. The total produce of 250,000 acres would be, at Mr. Thornton's rate, 1,500 million lbs.; 20 million people at 66 lbs. a year would consume 1,320 million lbs. As there is hardly any provincial export of such perishable articles, the crop produced must approximately equal the consumption; so the one ought to be raised to 75 lbs. per head per annum, or the other lowered to 5,300 lbs., or 66 maunds per acre. In either case, all that we have to deal with is the quantity sold by the rural to the urban population. At 66 lbs. per head, this would be 132 million lbs., valued at Rs. 8,80,000; in the other case, at 75 lbs. per head, it would be 150 million lbs., valued at Rs. 10,00,000. In such a calculation as the present one, the difference is not very important.

13. *Spices and condiments.*—Mr. Thornton's area under spices and condiments is 200,000 acres, the estimated produce 500 lbs. per acre, and the value Rs. 40 per acre, or 12½ lbs. per rupee. Major Wace's area agrees with the above. Of these articles, there appears to be no net export in ordinary years, and the provincial consumption should equal the production. Mr. Thornton's rate of 4¼ lbs. per head per annum gives a total consumption of 85 million lbs. for the province, while the production is 100 million lbs. But there is good reason, from general knowledge of their habits, for thinking that the townspeople consume spices and drugs to a much greater extent than the country people. Moreover, the municipal statistics of the North-Western Provinces have led that Government to the conclusion that the annual urban consumption of these articles is in value from Re. 1 to Rs. 1-4 per head, so that it is a moderate estimate to put it at 12 lbs. per head. We should have then—

18 millions @ 4¼ lbs. - 76½ million lbs.
2 „ „ 12 „ - 24 „ „

which exactly accounts for the estimated production. The value of the 24 million lbs. sold by the rural to the urban population is 2 million of rupees.

14. *Ghi and milk.*—Mr. Thornton estimates the consumption of ghi to be 4¼ lbs. a year for agriculturists, but he states that the town consumption is 8 lbs. as shown by the octroi returns, and this figure agrees almost exactly with that of the North-Western Provinces municipalities. The townspeople therefore require 16 million lbs., valued at 4 million rupees. Mr. Thornton states that the provincial net imports of ghi are worth 8 million of rupees. If so, the conclusion would be that the rural population not only do not sell any ghi to the town, but require to buy some for their own consumption; and this is hardly credible. The Annual Administration Report for 1877-78 (page 115) states the total value of ghi imported for the three previous years at Rs. 13,13,000, and the total value exported at Rs. 19,68,000, which gives an annual net export of Rs. 20,00,000 worth. Assuming that these figures are correct, and that Mr. Thornton has made a slip, the rural population make Rs. 40,00,000 from the townspeople and Rs. 200,000 from exports, total Rs. 42,00,000 by their ghi. Of milk, at Mr. Thornton's estimate of 15 lbs. a head, the town require 30 million lbs., worth a little less than one million of rupees.

15. *Tobacco.*—Mr. Thornton puts the area cultivated with tobacco at 74,000 acres, the average produce at 1,000 lbs. per acre, and the price at 37 lbs. per rupee, or less than Rs. 30 per acre. This is much below the North-Western Provinces' estimate. At the rate of 4 lbs. per head, the consumption of the province is 80 million lbs., while the out-turn is only 74 millions. The North-Western Provinces' estimate of urban consumption is 8 lbs. per head. Mr. Thornton states that some tobacco is imported (the Annual Report states it as 3,200,000 lbs. per

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* The Punjab reply to the *Questionnaire* of the International Statistical Congress gave the average estimated weight of a sheep when slaughtered as 13½ seers. Now the price paid for a sheep varies probably from Re. 1 to Rs. 1-8, or say 1¼ annas per seer, or 1⅛*d.* per lb.

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annum), and that the Jat Sikhs do not smoke, but they are only 6·5 per cent. of the entire population.* Taking the North-Western Provinces' rate, the townspeople consume 16 million lbs., worth rather less than half a million of rupees. Deducting the import from this, we may put the amount sold by the rural population at 13 million lbs., value Rs. 3,50,000.

16. *Sugar.*—Sugar is an item of consumption hardly touched on by Mr. Thornton, who alludes only to "occasional sweetmeats," which he includes among the head of miscellaneous. The North-Western Provinces' estimate of consumption is 30 lbs. of coarse sugar, and 10 to 12 of fine sugar per head of town population. The rural population buy very little fine sugar, but they make their own coarse sugar. The area under sugar-cane is put by Major Wace at 350,000, by Mr. Thornton at 374,000 acres; and the latter estimates the production at 1,600 lbs. per acre (600 million lbs. in all), worth 33 lbs. per rupee, or Rs. 48 per acre. This is very much below the North-Western Provinces' estimate (in Shahjahanpur over 4,000 lbs. of "rab" is produced per acre), and is undoubtedly too low. At 30 lbs. per head, the whole produce, 600 million lbs., would be required for the use of the province in coarse sugar alone, leaving none for refining or for export. Ten lbs. of fine sugar are made from 30 lbs. of coarse, so that, if each person consumed at the rate of the North-Western Provinces' municipal estimate, they would require 1,200 million lbs. They do not, however, consume as much in the villages, but enough has been said to lead to the conclusion that Mr. Thornton's estimate of production is too low. But we are now concerned only with the urban consumption and the export. The two millions in the towns consume 60 million lbs. of coarse, and 20 million of fine sugar, or 120 million lbs. of coarse sugar, reducing the two kinds to a common denominator. The average net imports during the last three years† have been 14 million lbs. of refined, and 20 million lbs. of coarse sugar, which is equal to 62 million lbs. of coarse sugar. The net sales by the rural to the urban population are therefore 58 million lbs. of coarse sugar, worth a little less than two million rupees.

17. *Oil. Oil for lighting.*—This subject also is hardly touched by Mr. Thornton. The North-Western Provinces' municipal estimate of consumption is 4½ seers of oil; and, allowing that the village consumption is less, it may be put at four seers, or 8 lbs., of oil per head per annum, or 32 lbs. of oil-seeds, value about one rupee. The Punjab will therefore require 640 million lbs. of oil-seeds for its own use. It also exports this article largely, the average export* of the last three years being 970,000 maunds, or 77½ million lbs. The total production must therefore be about 720 million lbs. Adding on for seed-grain and wastage, the production must be 770 million lbs. But Mr. Thornton only credits it with 300 million lbs. grown on 720,000 acres. The explanation of this decrepancy is no doubt (as pointed out by Mr. Buck in his paper on the North-Western Provinces' production) that, in the majority of cases, oil-seeds are not grown by themselves, but mixed in small quantities with wheat and barley and other such crops. However, the townspeople take 64 million lbs. of oil-seed, and the export trade take 77½ million lbs.—total (say) 140 million lbs., worth 4¼ million rupees, or Rs. 42,50,000 to the rural population who raise them.

18. *Clothing materials. Clothing.*—Mr. Thornton estimates that the cost of cotton and woollen clothing, and of shoes, comes to Rs. 2·72 a head for the agriculturist. Of this, about Rs. 2 goes for cotton clothing, 4 annas for woollen clothing, and 8 annas for shoes. But while the country people mostly wear native-woven cloths, townspeople mostly wear English-woven cloth, and it is difficult to make an estimate of what the value is of cotton supplied to the town either for woven wear or for wadded quilts. Raja Lachman Singh's estimate for the North-Western Provinces was 3 lbs. 10 oz. of cotton, worth about Rs. 1-12 per head; and this included the urban poor—say half the urban population. Considering how much cotton is used for wadded clothes in the colder climate of the Punjab, it would not be perhaps excessive to adhere to this estimate, or, for safety's sake, we may put the consumption of native cotton by the townspeople at three lbs., or, say, at present prices, 8 annas a head.

As to the shoes, which Mr. Thornton prices at 8 annas, the rural population will only receive the price of the leather, or, say 4 annas, the rest being chargeable to workmanship; thus, for cotton, wool, and leather they will receive from the urban population 1 rupee a head, or 2 million of rupees. Besides this, there is an annual export of about 2 million rupees' worth of cotton, and the same value in wool, and about 3 millions of rupees' worth of hides and leather, of which perhaps two-thirds would be the price of the raw material. The total receipts of the rural population, therefore, from cotton, wool, and leather will be about 8 millions of rupees.

19. *Timber and Fuel.*—Mr. Thornton reckons that the timber imported into town is worth Rs. 22,00,000; and the fuel required for 2 million of people is worth 4½ million rupees. But this price includes the cost of labour in felling and splitting and of carriage, and a very small portion of it, I conceive, reaches the owner of the land on which the timber or wood grew. Adding in, as Mr. Thornton does, 4 million rupees for the price of timber used for public works and furniture, and fuel for locomotives, manufactories, &c., I should doubt if, out of the total 11 millions, 2 millions of rupees reached the producer.

20. *Indigo, Poppy, and Miscellaneous.*—There remain the three non-food crops, indigo, poppy, and "miscellaneous," which cover an area of 916,000 acres according to Mr. Thornton, 200,000 acres according to Major Wace; and the value of their produce is estimated at about Rs. 20 an acre. The rate is a fair one, and the value (adopting Major Wace's acreage) is 4 millions of rupees.

21. *Summary of Receipts.*—The receipts of the rural population from their surplus produce may then be summed up thus:—

	Rs.
Food crops - - -	5,00,00,000
Meat - - - -	16,66,000
Vegetables - - -	10,00,000
Spices and condiments - -	20,00,000
Ghi and milk - - -	52,00,000
Tobacco - - -	3,50,000
Sugar - - - -	20,00,000
Oil - - - -	42,50,000
Clothing materials - -	80,00,000
Timber and fuel - -	20,00,000
Indigo, poppy, and miscellaneous - - -	40,00,000
	8,04,66,000

Deducting 10 per cent. for the difference between village and market prices, the surplus amounts to 72 millions of rupees. This comes to Rs. 4 a head, or about Rs. 20 a family, if spread over the whole rural population. These profits, however, will accrue not to the labourers, shepherds, carpenters, &c., but for the most part to those who possess rights and interests in the land, and who number, as calculated in paragraph 3, about 13¼ millions. Their profits will thus be about Rs. 5-8 a head, or Rs. 24 a family.

22. *Necessary Expenditure and common Luxuries.*—There are only two items of necessary expenditure that have to be set against this income. The first is revenue and local cesses, which Mr. Thornton states

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* Census Report, paragraph 28.

† Administration Report for 1877-78, page 115.

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amount to 24 millions of rupees. The next is salt, which, at the jail ration (calculated as in page), is consumed at the rate of 9 lbs. per head, or 162 million lbs. per annum. This will cost them about 9 million rupees. There are two other sources of expenditure, the purchase of refined sugar, and of English-woven cloth, neither of which is, strictly speaking, a necessity, though they are so universally bought that they deserve to be taken into account. The English piece-goods imported (net) into the province are worth 34 millions of rupees a year. The town consumption of these at Rs. 6 a head is 12 million rupees, leaving 22 million rupees' worth to be used by the 18 million of rural population or more than Re. 1 per head; which seems a high estimate, though I have no other data to check it by.* For refined sugar, again, I know of no statistics to show the amount consumed by the rural population; but, as a mere guess, putting it at half the amount with which the town residents have been credited, or 5 lbs. a head, it amounts to 90 million lbs., or about 13 million rupees.

23. *Summary of Expenditure.—Balance struck.*—The expenditure on necessaries not produced in the villages, and on common luxuries, and in taxes, is as follows:—

	Rs.
Land tax and cesses - -	2,40,00,000
Salt - - - - -	90,00,000
Refined sugar - - -	1,30,00,000
English cloth - - -	2,20,00,000
	6,80,00,000

leaving only about four million rupees as surplus profits from direct agricultural produce, available for savings, or for expenditure on other luxuries.

24. *Conclusion.*—I offer this estimate with the more diffidence because I have no local knowledge of the Punjab, and because I have ventured to differ in some respects from so distinguished an authority as Mr. Thornton. If my method is an unsound one, I have no doubt its error will be exposed by the criticism to which it will be subjected; if it is sound, I trust that those who have the local knowledge, which I do not possess, will assist me, by correction of any erroneous details, to work out a fairly accurate calculation of the economic condition of the rural population of the Punjab.

25. The difference between the outcome of our two calculations is this: Mr. Thornton takes the *agricultural* population at 11 millions, and attributes to them a profit of 140 million of rupees. I take the *rural* population at 18 millions, and attribute to them a profit (after paying for necessaries and taxes) of 39 millions of rupees, derived solely from the land, over and above the profit derived from other occupations which a large portion of them pursue side by side with agriculture; and out of that 39 millions I reckon that 35 are spent on common luxuries, leaving only four for hoarding. The margin is no doubt a small one, but the estimate provides amply for all the necessaries of life, and there must be a considerable profit for the larger landowners when the whole rural population can be shown to be well supplied with the means of living.

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* Except an inquiry made by Mr. Moens in Bareilly, who found that 430 agricultural persons bought Rs. 243 worth of English cloth in the year. This is hardly 8 annas a-piece. (Settlement Report, page 50).

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Elliott.

The land revenue of the North-Western Provinces and Oudh is assessed on each village, and is fixed for a period of 30 years. The fixing of the land revenue is called a settlement. The first 30 years' settlements were carried out generally between 1835 and 1840; and the revision of these settlements for a second period of 30 years began about 1860, and though finished in most districts, is still going on in four. In Oudh the settlement was taken in hand shortly after the Mutiny of 1857 had subsided, and it was concluded, with the exception of some revising operations, about 1877.

2. The principle of the first 30-year settlement in the North-Western Provinces was that Government was entitled to take as its share $\frac{2}{3}$rds of the gross average rental of the land, leaving to the landowners $\frac{1}{3}$rd of the rental, besides the ordinary profits of cultivation. But in 1854 the general standard of comfort had risen so much, and the opinion prevailed so widely that it was for the good of the country that a larger margin of profit should be left to the landowners, that the Government of the time decided to lower the land revenue at the next assessment to 50 per cent. of the gross rental. But still the increase in the cultivated area had been so large between 1840 and 1870, and the rise in rents due to higher prices and to increased competition so considerable, that in most districts the half of the rental of 1870 has proved to be more than two-thirds of that of 1840.

3. In estimating the gross average rental of a village, the main duty of the Settlement Officer is to ascertain the actual facts; that is, to find out what rents are really paid by cultivators to landlords, and, by applying similar rates to lands which are not rented but are held as home farms, let at low rates to relations, &c., to calculate what sum of money the whole estate would bring in if it were all rented. A good deal of land is rented below its real value, from reasons which belong to the past history of the village and the relations between landlord and tenant in former times. The Settlement Officer has to estimate what would be a fair rent on such lands, and he does this by classifying the soil according to its qualities and productive powers, and by ascertaining, over large tracts of homogeneous land, what rates of rent cultivators pay on an average on each class of soil where no special causes for leniency exist. In this way the full average rental of a village or an estate is calculated; and whether the landlord collects the whole of that sum as rent, or is pleased to remit any portion of it to the tenants or others, half of it is taken by the Government as land revenue.

4. The table below shows for the North-Western Provinces the difference between the old and new assessment, as far as the latter had been made on 30th September 1878, and for all districts the incidence of the land revenue on the cultivated area. The incidence on different classes of soils need not be stated here. It will be found in the settlement report for each district; and a large collection of the rates is given in pages 40–62 of the appendices to Mr. A. Colvin's "Memorandum on the revision of land revenue settlements in the North-Western Provinces" (1872). The classification of land is too various and complicated to convey any meaning, except to the mind of an expert. Speaking very roughly, however, the following figures may be mentioned as shewing the rates at which the land revenue falls on the more ordinary classes of the soil:—

	Rs. per acre.
Good land near the village site, highly manured and irrigated - - -	4 to 6
Good land at a little distance from the site manured occasionally and irrigated -	2 to 4
Good outlying land, irrigated - -	$1\frac{1}{2}$ to 3
Good unirrigated land, at a little distance from the site, occasionally manured -	1 to 2
Good outlying land, unirrigated - -	1
Sandy ditto ditto - -	$\frac{1}{4}$ to $\frac{1}{2}$

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NORTH-WESTERN PROVINCES.

Mr. Elliott.

In the suburban lands of large towns, Rs. 10 or 12, and even Rs. 20, per acre would not be an excessive rate of assessment.

DISTRICTS.	Former assessment.	Present assessment.	Rate per cultivated acre.
NORTH-WESTERN PROVINCES.	Rs.	Rs.	Rs. A.
Dehra Dun - -	40,200	63,422	0 15
Saharunpur - -	10,22,531	11,74,161	1 9
Muzaffarnagar - -	11,34,174	12,22,726	1 14
Meerut - -	17,94,616	21,83,929	2 1
Bulandshahr - -	11,07,796	12,38,363	1 11
Aligarh - -	18,48,575	21,38,756	2 6
Kumaun - - -	1,26,886	2,35,146	1 4
Garhwal - -	68,180	96,186	0 14
Bijnor - - -	11,82,005	11,83,453	2 0
Moradabad* - -	9,13,213	14,33,409	1 13
Budaun - - -	9,28,475	10,36,465	1 3
Bareilly - -	17,00,909	20,50,079	1 12
Shahjahanpur - -	9,75,270	11,81,654	1 13
Muttra* - -	11,19,655	15,95,409	2 8
Agra - - - -	10,47,091	20,15,262	2 3
Farukhabad - -	11,25,342	12,32,874	1 13
Mainpuri - - -	11,19,524	12,65,831	2 1
Etawah - - - -	11,94,999	13,26,704	2 10
Etah - - - -	7,32,460	9,22,245	1 8
Jalaun - - -	8,75,970	9,15,035	1 11
Jhansi - - -	5,89,097	4,48,507	1 2
Lalitpur - - -	1,66,255	1,49,055	0 12
Cawnpore - - -	21,30,405	21,58,240	2 8
Fatehpur - -	14,05,815	13,07,505	2 7
Banda* - - -	—	13,01,295	1 10
Allahabad - -	16,83,247	23,67,547	2 6
Hamirpur* - - -	—	10,80,532	1 8
Jaunpur - - -	—	12,48,119	2 2
Gorakhpur -	20,65,305	16,84,388	1 1
Basti - - -		13,19,470	1 2
Azamgarh* - -	12,99,012	18,96,386	2 2
Mirzapur - -	—	8,43,395	1 0
Benares - - -	—	8,96,290	1 15
Ghazipur - -	—	15,15,672	1 8
Total for N.-W. P. -	—	4,28,94,255	1 12 2
OUDH.			
Lucknow - - -	—	7,82,578	2 5 9
Unao - - -	—	13,48,539	2 3 6
Bara Banki - -	—	15,74,659	2 5 6
Sitapur - - -	—	13,23.452	1 6 10
Hardoi - - -	—	13,73,297	1 9 11
Kheri - - -	—	9,35,991	1 3 9
Fyzabad - - -	—	11,65,435	1 14 9
Bahraich - -	—	9,67,575	1 2 2
Gonda - - -	—	15,38,805	1 7 0
Rae Bareli - -	—	12,88,877	2 5 5
Sultanpur - - -	—	12,00,147	2 1 8
Partabgarh - -	—	9,84,687	2 3 4
Total for Oudh -	—	1,44,84,042	1 12 3

N.B.—The districts marked * were still under assessment in 1878.

5. These settlements have been made with great care and elaboration by a picked set of officers selected as being the most capable of the younger members of the civil service; and there can be no doubt that on the whole the assessments fixed by them do accurately represent a fair half of the gross average rental. Some, no doubt, are lighter, and some heavier; the most questionable cases are either those where rent is taken in kind and an estimate of its average money-value has to be formed, or else where the crops vary so violently with the fluctuations of the seasons that the average is peculiarly hard to strike. But, on the whole, the incidence is acknowledged both by the collectors of the districts and by the best informed native gentlemen to be fair and equable, and the revenue is collected with ease and punctuality.

6. The proportion borne by the land revenue to the estimated value of the annual gross produce was shown in the discussion of question 3 to be about 13 per cent., or between $\frac{1}{7}$ and $\frac{1}{8}$.

7. The following principles have been prescribed for fixing the dates at which instalments of revenue are payable:—that the cultivator should not be bound to pay his rent until a little time has elapsed after his main crops have become ripe, so as to allow him to sell in an open and not a forced market a portion of that crop; and that a month after the landowner can demand rent from the cultivator, the revenue should become due from him to Government. If the date is fixed too early, *i.e.*, before the crop is ripe or is harvested, the cultivator has no cash in his hands, and is forced to borrow. If it is fixed too late, an improvident cultivator may be tempted to dispose of his cash before the landowner comes to demand it. It is necessary to choose a judicious medium between these two errors.

8. Another consideration to be borne in mind is this,—that the rent ought to be paid as far as possible out of crops which the cultivator sells, not out of those which he would naturally keep for his own consumption. The rain-crops which ripen earliest, such as the light coarse millets, the coarser rices, and the Indian corn, are almost entirely grown for home-consumption, and, broadly speaking, all the rain-crops (except indigo and cotton) are grown for food rather than for sale, and a much smaller proportion of these than of the spring crops (wheat and barley) comes into the market at all.

9. The cultivator receives more cash, therefore, in the spring than in the autumn, besides which he has also to buy seed in the autumn at the rate of about 100 lbs. to the acre for the winter crops. It follows, therefore, that for the autumn rent the cultivator has more occasion to borrow than for the spring rent, unless due consideration has been made in fixing the instalment. When a proper arrangement has not been made, it generally occurs that the cultivator has to borrow not only money for rent, but grain for seed. Money is lent at half an anna per rupee per month, which is equivalent to 37½ per cent. per annum. Seed is borrowed at different rates. Sometimes it has to be repaid in kind *plus* 50 per cent., so that if a cultivator borrows 10 maunds in October, he must return 15 in April; sometimes the *value* of the seed-grain has to be repaid with 50, or more commonly with 25 per cent. additional, at harvest, and the lowest rate of interest ever charged is half an anna per rupee per month. Grain at sowing time is always dearer than at harvest time; so that if 10 maunds are lent in October when grain fetches (say) Rs. 3 a maund and returned in April when grain fetches (say) Rs. 2 a maund, the cultivator has to pay 15 maunds, worth Rs. 30, *plus* interest, Rs. 5–10, to clear off his debt. Everything ought to be done, therefore, to prevent the cultivator being thus mulcted.

10. So far the question has been treated with regard only to cultivators' interests. But financial interests are also much concerned. If at one season a very large tract of country is called upon to supply the Government treasuries with hard cash, there is a sudden demand for silver coin which drains the market and affects circulation. The cash is meanwhile locked up and doled out month by month in payment of the various military and civil establishments of the country. It would therefore be convenient, from a financial view, that collections should be made at different dates in different parts of the same district, and this is what would occur if homogeneous tracts and villages were in practice treated as the settlement rules intended that they should be treated.

11. Mr. Buck gives the following examples to illustrate the way in which the instalments can be brought into relation with the crops:—"The crops of a village A being divided into crops eaten by cultivators and crops sold, it is found to sell on an average Rs. 800 of rice in August, and Rs. 1,200 of sugar in January, and to eat the rest. The most convenient arrangement would be to require rent to be paid in the following proportions:—

Charged against rice - - 40 per cent., 15th Sept.
Ditto sugar - 60 „ „ 15th Feb.

Suppose another village, B, is found to sell Rs. 1,000 worth of indigo and cotton in October and November, and Rs. 1,000 worth of wheat and oil seeds in March and April, the arrangement might be—

Charged against indigo - 20 per cent., 1st Nov.
Ditto cotton - 20 „ „ 1st Dec.
Ditto wheat and oilseeds - 60 „ „ 1st May.

12. It is evident, however, from the replies sent in from the different districts that as yet these principles have not been effectually carried out. This has been due, partly to the difficulty of ascertaining the individual necessities of each village, partly to the fact that the principle above enunciated was only laid down in 1874, when most of the settlements had been completed. The previous system had rather been in the direction of treating both landowners and cultivators as children, assuming that the money would burn a hole in their pockets, and that it must be collected from them almost before they had got it, certainly not a day after. The instalments have now, as a general rule, been put back, so as to give everyone a better opportunity of realising a fair market-price; but they are still too uniform, and instead of varying with every village, or at least every homogeneous tract of country, they are often fixed for identical dates throughout a whole district, although it may consist of very distinct tracts, growing different kinds of crops, which ripen at different seasons.

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13. Another reason why collectors have made no objections to the existing arrangements is this, that the person with whom the collector has to deal being the landlord, the main difficulty does not present itself to him. Landlords, as a body, are only too glad to pay under a system which is inconvenient to the tenant and which gives them, the landlords, firstly, the opportunity of charging interest on arrears of rent, which interest never forms part of a recorded rental, and is, therefore, never charged with revenue; secondly, the opportunity of ejecting tenants who cannot pay, and of thus destroying their occupancy rights. Under these circumstances, it is natural that landlords should not object to the old system of fixing the instalments too early, and should not specially desire the introduction of the new system.

14. Mr. McConaghey, Collector of Banda, remarks that he "would certainly advocate that both the dates "and the proportions of the instalments should be "settled after consideration of the special and "general circumstances of each village, and should "not, except the circumstances are precisely the "same, be uniform for considerable areas." This view embodies the principles laid down in the settlement rules. What is now necessary is that each collector should be required by the local rules under the Act to make such alterations in the dates and amounts of the instalments as now fixed as will meet the circumstances of each part of his district which requires different treatment from any other part.

BENGAL.

BENGAL.
Mr. Toynb

13. *Incidence of Land Revenue, &c.*—The general incidence of land revenue on the cultivated area, estimated as explained in the answer to question 3, is shown in Statement I. district by district. The incidence on different classes of land cannot be given; nor is the amount of their gross produce known with anything approaching to accuracy. The figures in columns 3 and 5 have been worked out in accordance with the general plan of this report; but it cannot be too often repeated that they possess *per se* no statistical value whatever. Bengal and Behar being permanently settled under the Regulations of 1793, no re-adjustment of the land revenue, however desirable it might be, is possible. The settlement of Orissa expires in 1879. Of late years there has never been any practical difficulty in realising the land revenue in Bengal, nor in Orissa, except during the years following the famine, when Rs. 15,84,391 were remitted, the condition of the remission being that the zamindars should give a corresponding remission of rent to their ryots. It would be strange, indeed, if it were not so, considering the difference between the amount of the Government demand on, and the gross rental of, the land in Lower Bengal. The following figures exhibit this difference in a very striking light. The figures for "rental" include the rental of revenue-free and of some of the rent-free lands which are not exhibited separately in the returns. Fuller details will be found in Statement II.

Division.	Government Revenue (per Year of Valuation.	Gross Rental.
	Rs.	Rs.
Burdwan - - -	79,74,891	1,85,40,026
Presidency - -	51,16,523	1,42,35,364
Rajshahye - -	48,65,840	1,59,30,574
Dacca - - -	39,71,399	1,91,25,288
Chittagong - -	12,43,749	59,58,881
Patna - - -	80,26,164	3,73,48,552
Bhagulpore - -	31,60,941	1,15,05,324
Orissa - -	17,36,845	40,19,130
Chota Nagpore - -	3,01,102	37,15,796
Total - -	3,63,97,454	13,03,78,935

No stronger argument than the above figures could be brought forward to show that State expenditure in times of scarcity should be resorted to as seldom and as sparingly as possible. The difficulty lies in the attempt to place the burden on the right shoulders.

The instalments of revenue, which are *due* according to the original agreements made at the time of the permanent settlement, are now *payable* only on the following dates, without reference to the time of harvest:—

In Bengal, 12th January, 28th March, 28th June, and 28th September.

In Behar, 12th January, 28th March, 7th June, and 28th September.

In Orissa, 28th April, 8th November.

In the Chittagong district there are five kists, and in Darjeeling and all the districts of Chota Nagpore, where the sunset sale law (Act XI of 1859) is not in force, there are no fixed dates for payment, except such as are specified in the landlord's agreement. It is the above fixed dates of payment which now chiefly regulate the collections of rent by landlords.

No interest is charged on arrears of land revenue. The unrelenting nature of the Government revenue demand, without reference to the goodness or badness of season, although it does not now lead to wholesale transfers of landed property, yet may have the evil effect of making both the poorer land-owning and the cultivating classes to some extent dependent on the money-lending classes. The high interest charged by these latter renders it difficult for their debtors, even in a good season, to extricate themselves from the debts incurred in a bad one, and when two or more bad seasons follow one another they become involved.

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BENGAL.

r. Toynbee.

STATEMENT I.

STATEMENT showing the INCIDENCE of LAND REVENUE on CULTIVATED AREA, SALES of ESTATES, PRICES of LAND and LABOUR, &c.

Division.	District.	Cultivated area in acres.	Land Revenue (current demand for 1876–77).	Incidence of Land Revenue on cultivated area.			Average Price of Land per Acre (as given by District Officers).	Land sold for Arrears of Revenue (Average of last Three Years).		Wages usually paid to Field Labourers.
								Number of estate.	Price.	
1.	2.	3.	4.	5.			6.	7.	8.	9.
			Rs.	Rs.	A.	P.	Rs.		Rs.	
Burdwan	Burdwan	2,009,680	33,54,440	1	10	8	150	28	37,681	Two and a half annas per day.
	Bankoora	423,000	2,08,708	0	7	11	—	3	752	Two annas per day.
	Beerbhoom	566,400	7,26,385	1	4	6	40	2	8,669	Four rupees a month for ordinary labourers.
	Midnapore	2,309,000	22,68,877	0	15	9	26	14	26,968	Two annas per diem.
	Hooghly and Howrah.	818,750	12,81,502	1	9	1	66 to 70	18	20,761	Four annas per diem *plus* a midday meal of parched rice.
Presidency	24-Pergunnahs.	1,036,485	17,18,031	1	10	6	30 to 150	11	19,024	Three annas per day.
	Nuddea	1,063,720	10,43,981	0	15	8	15	12	4,766	Three to four annas per diem.
	Jessore	1,784,300	10,79,728	0	9	8	30 to 40	11	2,207	Four annas per day.
	Moorshedabad.	989,000	14,14,501	1	6	10	40	21	10,246	Rs. 5 per month, paid partly in food.
Rajshahye	Dinagepore	1,689,000	16,69,063	0	15	9	45	2	15,235	Rs. 2 per month with food, or Rs. 4-8 without food.
	Rajshahye	886,866	9,32,970	1	0	10	45 to 60	3	2,498	Two and a half annas per day.
	Rungpore	1,934,000	9,84,251	0	8	1	—	2	31,955	Two and a quarter annas per day.
	Bogra	964,040	4,02,630	0	6	8	60	1	645	Rs. 2-8 per month with board, Reapers at Rs. 7 per month with food.
	Pubn	439,842	3,84,014	0	14	0	15	7	3,170	Two and a quarter annas per day.
	Darjeeling	—	77,643	—			10 to 15	—	—	Two annas eight pies per day, together with food.
	Julpigoree	350,719	2,99,118	0	13	8	40	—	—	There are very few regular agricultural labourers here, but men can be obtained at three to four annas a day.
Dacca	Dacca	1,296,513	4,87,116	0	6	0	50 to 70	19	98,154	Rs. 5 to 6 per month for day labourers.
	Furreedpore	704,640	5,00,988	0	11	4	60	13	2,043	Four annas per day.
	Backergunge	2,406,634	13,08,897	0	8	8	57	5	2,086	From four to eight annas a day. Reapers receive a share of the crop in return for their labour.
	Mymensingh	1,430,464	8,68,738	0	9	9	101	11	4,363	Rs. 6 a month.
	Tipperah	1,270,649	10,07,681	0	12	9	60 to 70	7	1,615	Three annas and six pies per diem.
Chittagong	Chittagong	544,640	6,71,031	1	3	8	49	274	1,19,690	Four annas a day.
	Noakholly	703,140	4,60,478	0	10	5	40 to 80	4	2,880	Four annas per day.
Patna	Patna	1,163,153	14,85,472	1	4	5	80	4	11,756	One anna or 3 seers of paddy or *khesari* per day.
	Gya	1,728,000	13,66,924	0	12	7	100	2	5,337	One anna per day, or 2½ seers of paddy or *janira*.
	Shahabad	1,690,000	17,47,619	1	0	6	60	10	68,502	Two and a half seers of grain per day.
	Durbhunga	2,049,009	4,98,371	0	3	10	100	24	96,594	One anna and one meal a day. During harvest from 5 to 6 per cent. of crop.
	Mozufferpore	1,816,000	12,14,867	0	10	8	60			
	Sarun	2,320,000	12,24,242	0	8	5	100 to 120	4	6,191	Three to four seers of grain, and quarter seer of peas or gram per day.
	Chumparun	1,437,000	5,11,442	0	5	8	60 to 70	—	—	One anna and two pies *plus* a meal a day. Reapers receive one out of every 16 bundles reaped.
Bhagulpore	Monghyr	1,952,000	8,58,343	0	7	2	150	12	29,861	Two annas per day or two seers of grain.
	Bhagulpore	2,835,961	5,64,935	0	3	2	50 to 80	11	19,367	A day's food in kind.
	Purneah	1,586,357	11,22,012	0	11	4	40	11	2,143	Three seers unhusked rice and one meal per day for six hours' work.
	Maldah	442,622	4,04,082	0	14	7	15 to 20	6	5,572	Two annas per day *plus* a midday meal or 4 bundles of paddy for every 20 bundles cut.
	Sonthal Pergunnahs.	815,207	2,18,877	0	4	4	48	—	—	One and a half to two annas per diem, or three seers unhusked rice and one seer *chura*. Reapers receive one sheaf of grain in straw to every ten they cut.
Orissa	Cuttack	1,350,000	8,65,509	0	10	3	75 to 85	4	18,614	Six to 7½ seers of unhusked rice per day.
	Pooree	664,320	4,75,564	0	11	10	46	2	2,603	Rs. 2 per month *plus* two suits of clothes in the year.
	Balasore	583,259	4,11,531	0	11	4	35	4	387	Two and a half annas per day for ordinary day labourers, besides a dole of tobacco and an occasional meal.
Chota Nagpore.	Hazareebagh	1,318,912	1,15,088	0	1	5	5 to 20	—	—	An anna and a half a day.
	Lohardugga	2,823,738	1,10,376	0	0	8	40 to 60	—	—	One and a quarter to one and a half annas per day.
	Singbhoom	635,648	54,517	0	1	5	28	—	—	From two to four seers paddy daily with a handful of coarse grain.
	Manbhoom	1,812,800	88,250	0	0	9	30 to 60	—	—	One a half annas per diem.
	Total	54,645,468	3,64,88,787					562	6,82,335	

STATEMENT II.

STATEMENT showing the AREA, POPULATION, LAND REVENUE, and ROAD CESS VALUATION of all ROAD CESS DISTRICTS.

Division.	District.	Area in square miles.	Population.	Land Revenue of year of Valuation.	Rental as per Road Cess Valuation.
				Rs.	Rs.
Burdwan	Burdwan	3,455	2,034,745	33,54,440	74,94,099
	Bankoora	1,422	526,772	2,06,965	6,96,978
	Beerbhoom	1,344	695,921	7,37,900	16,14,177
	Midnapore	5,082	2,545,179	22,15,611	57,26,011
	Hooghly (with Howrah)	1,467	1,488,556	14,59,975	30,08,761
	Total	12,770	7,291,173	79,74,891	1,85,40,026
Presidency	24-Pergunnahs	2,788	2,210,047	16,73,989	43,76,798
	Nuddea	3,421	1,812,795	10,41,852	27,50,647
	Jessore	3,658	2,075,021	10,50,393	38,28,090
	Moorshedabad	2,462	1,353,626	13,50,289	32,79,829
	Total	12,329	7,451,489	51,16,523	1,42,35,364
				Rs.	Rs.
Rajshahye and Cooch Behar.	Dinagepore	4,126	1,501,924	17,12,844	33,01,980
	Rajshahye	2,234	1,310,729	10,33,524	34,08,969
	Rungpore	3,476	2,149,972	9,98,758	46,41,644
	Bogra	1,501	689,467	4,05,159	12,57,981
	Pubna	1,978	1,211,594	3,71,102	15,14,735
	Darjeeling	1,234	94,712	71,008	5,29,163
	Julpigoree	2,906	418,665	2,73,445	12,76,102
	Total	17,455	7,377,063	48,65,840	1,59,30,574
Dacca	Dacca	2,796	1,852,993	4,92,775	22,49,524
	Furreedpore	2,249	1,511,878	3,31,038	12,01,030
	Backergunge	3,648	1,878,144	13,10,505	69,59,267
	Mymensingh	6,299	2,349,917	8,33,869	51,55,085
	Tipperah	2,460	1,533,931	10,03,212	35,60,382
	Total	17,452	9,126,863	39,71,399	1,91,25,288
Chittagong	Chittagong	2,322	1,127,402	6,71,031	30,32,345
	Noakholly	1,852	713,934	5,72,718	29,26,536
	Total	4,174	1,841,336	12,43,749	59,58,881
Patna	Patna	2,101	1,559,638	14,02,982	57,90,154
	Gya	4,716	1,949,750	13,72,670	70,44,015
	Shahabad	4,385	1,723,974	17,48,202	56,52,208
	Durbhunga	3,004	2,196,324	5,48,662	63,19,138
	Mozufferpore	3,335	2,188,382	12,17,904	44,15,325
	Sarun	2,654	2,063,860	12,20,679	55,06,769
	Chumparun	3,531	1,440,815	5,15,065	26,20,943
	Total	23,726	13,122,743	80,26,164	3,73,48,552
Bhagulpore	Monghyr	3,922	1,812,986	8,46,381	33,79,596
	Bhagulpore	4,268	1,826,290	6,85,560	43,09,309
	Purneah	4,957	1,714,795	12,29,335	28,59,695
	Maldah	1,813	676,426	3,99,665	9,56,724
	Total	14,960	6,030,497	31,60,941	1,15,05,324
Orissa	Cuttack	4,513	1,622,584	8,47,401	21,07,442
	Pooree	2,472	769,674	4,85,345	10,41,445
	Balasore	2,068	770,232	4,04,099	8,70,243
	Total	9,053	3,162,490	17,36,845	40,19,130
Chota Nagpore	Hazareebagh	7,021	771,875	1,10,343	10,47,847
	Lohardugga	12,044	1,237,123	1,02,559	14,87,154
	Manbhoom	4,921	995,570	88,200	11,80,795
	Total	23,986	3,004,568	3,01,102	37,15,796
	GRAND TOTAL	135,905	58,408,222	3,63,97,454	13,03,78,935

Note.—The figures in the last two columns are taken from the Board's valuation completion reports to Government.

Chap. I. Qn.13.

Central Provinces.

Mr. Nicholls.

CENTRAL PROVINCES.

Incidence of Land Revenue.—At the time of settlement, owing, perhaps, to the paucity of irrigation, the assessments were fixed by a classification of soils, and no distinction was made between irrigated and dry cultivated lands. Nor can I now attempt to show separately the incidence of the land revenue on such different classes of land.

The following statements (A.) and (B.) show the incidence of the land revenue on the cultivated lands, and on the culturable malguzari lands, and its proportion to the gross produce calculated on the present cultivated area,* valued, *first*, at the rates prevailing at the settlement time, and, *secondly*, at the rates of the present day.

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* See statement of area of cultivation under Group 3, page 104.

(A.)—Statement showing Land Revenue, Acreage Rates, and Value of Gross Produce at Time of Settlement.

Districts.	Value of Food Grains.	Value of Oil-seeds.	Value of Sugar-cane.	Value of Cotton.	Value of other crops.	Total value of produce.	Total Land Revenue assessed.	Average rate per acre.		Proportion the Land Revenue bears to value of gross produce.
								On cultivated lands.	On culturable including cultivated lands.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. a. p.	Rs. a. p.	
Nagpur - -	42,73,061	5,74,449	66,240	18,06,735	2,19,380	69,39,765	8,30,313	0 13 5	0 9 3	One-8th
Bhandara - -	43,94,715	1,47,054	3,43,960	360	56,170	49,42,269	4,04,013	0 7 11	0 4 5	One-12th
Chanda - - -	38,11,551	2,57,817	2,39,840	5,44,950	1,28,040	49,82,198	2,50,072	0 5 9	0 1 1	One-20th
Wardha - -	28,46,467	4,62,684	27,560	33,36,315	80,670	68,53,696	5,12,345	0 9 1	0 7 6	One-12th
Balaghat - -	25,05,773	73,731	94,520	—	19,950	22,73,974	1,59,217	0 5 5	0 3 5	One-17th
Upper Godavari -	1,14,540	5,139	240	9,525	2,520	1,21,934	19,968	0 13 8	0 5 7	One-6th
Jubbulpore - -	55,84,163	2,74,086	82,280	3,38,475	51,860	63,30,864	5,79,226	0 8 11	0 6 8	One-11th
Saugor - -	43,59,576	1,92,795	1,62,080	4,25,760	87,190	52,27,401	4,39,187	0 8 11	0 5 0	One-12th
Damoh - - -	21,50,053	1,17,152	35,080	1,91,820	50,840	25,44,945	2,66,324	0 9 9	0 5 4	One-10th
Seoni - -	34,80,313	2,07,633	42,020	1,40,040	36,550	39,06,856	1,49,403	0 3 9	0 2 7	One-26th
Mandla - - -	23,50,859	61,850	25,200	9,855	31,470	24,79,224	93,567	0 3 7	0 3 11	One-36th
Chhindwara - -	28,79,642	1,99,329	3,81,720	6,13,920	27,500	41,02,111	2,19,565	0 6 0	0 3 3	One-20th
Hoshangabad - -	40,77,928	1,99,800	4,55,000	3,54,585	4,09,020	54,55,533	4,28,115	0 7 5	0 6 0	One-12th
Narsingphur - -	32,11,989	26,664	95,360	8,23,890	45,280	42,03,183	4,21,810	0 10 11	0 8 10	One-10th
Betul - - -	31,57,503	1,77,141	3,43,080	33,135	80,130	37,90,989	1,96,015	0 4 6	0 2 4	One-20th
Nimar - -	15,67,050	96,993	11,560	5,74,080	48,600	22,98,343	1,78,847	0 6 0	0 4 9	One-13th
Kaipur - - -	92,98,126	5,55,486	13,22,360	12,38,205	5,34,680	1,29,47,857	5,45,209	0 3 7	0 1 9	One-24th
Sambalpur - -	36,08,520	3,19,998	1,95,000	7,47,405	1,15,190	49,86,103	1,16,834	0 1 4	0 1 0	One-42nd
Bilaspur - - -	34,15,886	2,01,300	4,20,800	8,47,500	—	48,85,486	2,64,314	0 3 4	0 1 10	One-18th
Total -	6,58,86,726	53,52,150	43,04,200	1,20,36,555	20,25,040	8,96,04,671	60,74,694	0 7 2	0 3 4	One-15th

(B.) Statement showing Land Revenue, Acreage Rates, and Value of Gross Produce at the Present Time.

Districts.	Value of Food Grains.	Value of Oil-seeds.	Value of Sugar-cane.	Value of Cotton.	Value of other crops.	Total value of produce.	Total Land Revenue assessed.	Average rate per acre.		Proportion the Land Revenue bears to value of gross produce.
								On cultivated lands.	On culturable including cultivated lands.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs. a. p.	Rs. a. p.	
Nagpur - -	1,06,82,652	17,23,347	66,240	18,06,735	2,19,380	1,44,98,354	8,30,313	0 13 5	0 9 3	One-18th
Bhandara - -	90,09,165	4,41,162	3,43,960	360	56,170	98,50,817	4,04,013	0 7 11	0 4 5	One-24th
Chanda - - -	95,28,877	7,73,451	2,39,840	5,44,950	1,28,040	1,12,15,158	2,50,072	0 5 9	0 1 1	One-45th
Wardha - -	71,16,167	13,88,052	27,560	33,36,315	80,670	1,19,48,764	5,12,345	0 9 1	0 7 6	One-23rd
Balaghat - -	62,64,432	2,21,193	94,520	—	19,950	66,00,095	1,59,217	0 5 5	0 3 5	One-42nd
Upper Godavari -	2,86,300	15,417	240	9,525	2,520	3,14,002	19,968	0 13 8	0 5 7	One-16th
Jubbulpore -	1,39,60,407	8,22,258	82,280	3,38,475	51,860	1,52,55,280	5,79,226	0 8 11	0 6 8	One-27th
Saugor - -	1,08,98,940	5,78,385	1,62,080	4,25,760	87,190	1,21,52,355	4,39,187	0 8 11	0 5 0	One-28th
Damoh - - -	53,75,132	3,51,456	35,080	1,91,820	50,840	60,04,328	2,66,324	0 9 9	0 5 4	One-22nd
Seoni - -	87,00,782	6,22,899	42,320	1,40,040	36,550	95,42,591	1,49,403	0 3 9	0 2 7	One-64th
Mandla - -	58,77,147	1,85,550	25,200	9,855	31,470	61,29,222	98,567	0 3 7	0 3 11	One-65th
Chhindwara -	71,99,105	5,97,987	3,81,720	6,13,920	27,500	88,20,232	2,19,565	0 6 0	0 3 3	One-40th
Hoshangabad -	1,01,94,820	5,99,409	4,15,000	3,54,585	4,09,020	1,19,72,825	4,28,115	0 7 5	0 6 0	One-25th
Narsinghpur -	80,29,972	79,992	95,360	8,23,890	45,280	90,74,494	4,21,810	0 10 11	0 8 10	One-21st
Betul - - -	78,93,757	5,31,423	3,43,080	33,135	80,130	88,81,525	1,96,015	0 4 6	0 2 4	One-45th
Nimar - - -	39,17,626	2,90,979	11,560	5,74,080	48,600	48,42,845	1,78,847	0 6 0	0 4 9	One-27th
Raipur - -	2,78,94,378	16,67,458	13,22,360	12,38,205	5,34,680	3,26,57,081	5,45,209	0 3 7	0 1 9	One-50th
Sambalpur - -	1,08,25,560	9,59,994	1,95,000	74,74,05	1,15,190	1,28,43,149	1,16,834	0 1 4	0 1 0	One-100th
Bilaspur - -	1,02,47,658	6,03,900	4,20,800	84,75,00	—	1,21,19,858	2,64,664	0 3 4	0 1 10	One-43rd
Total - -	17,39,02,877	1,24,54,303	43,04,200	1,20,36,555	20,25,040	20,47,22,975	60,74,694	0 7 2	0 3 4	One-37th

CENTRAL PROVINCES.

Mr. Nicholls

I offer the following observations:—

The assessments were made between 1863 and 1869, except for Sambalpur, for which a ten years' summary settlement has recently been concluded. At the time of the assessments, owing to the increased cotton cultivation due to the American war, to the opening up of the country by roads, the progress of railway works, large exports of grain to Berar and Bombay, also to Malwa and Hindustan in times of local scarcity and other extraneous causes, prices of agricultural produce ruled high, and were not expected to continue. As a matter of fact, from 1870 to 1876 they generally fell. Now, again, owing to the vast exports of wheat and oil-seeds to Europe, and to the drain caused by famine in Madras, Bombay, and the Nizam's dominions, they are exceptionally high. The produce out-turn shown in statement (A.) for the time of the settlement is calculated for a good year, but on the present acreage. I have kept the same out-turn figures for the gross produce of the present day, but have in the second statement (B.) valued this at the present market rates. But it is obvious that with the recent increase of cultivation we now have a considerably increased gross produce over that which was obtained at the time of settlement; consequently, the proportion of land revenue at the time of settlement to the value of the gross produce was heavier than that shown in statement (A.). Of course it is highly improbable that our present prices will be maintained; but on the other hand, our aggregate increase of production, coupled with the substitution of more valuable for inferior crops, will render the proportion of land revenue to the value of gross produce shown in my second statement a fair index of our present condition as regards the incidence of the land revenue demand, and not very greatly in excess of what we may expect in the immediate future.

It was the especial work of the Settlement Officers to accurately adjust the revenue demand according to the capabilities of the different classes of land, and it is neither desired nor desirable to alter their excellent work in any way, even were it possible to do so.

The work of assessment was carried out from 1863 to 1869; in Sambalpur in 1876 and 1877.

There has been no practical difficulty in realizing the land revenue as now assessed. In a very few individual villages of Damoh, Murwara, and Bhandara, slight over assessments have been long ago corrected. There is now no difficulty whatever.

The dates at which the instalments of revenue are payable, and their relation to the ordinary period of harvest or of realization of rents, are as follows:—

—	Harvests.		Payment of rents.		Payment of kists.	
	Kharif.	Rabbi.	Kharif.	Rabbi.	Kharif.	Rabbi.
Nagpur	December, middle of.	April, middle of.	December, end of.	April, end of	15th Jan.	15th May.
Wardha	Do.	Do.	Do.	Do.	Do.	Do.
Chanda, with Upper Godavari Sub-division	Do.	Do.	Do.	Do.	Do.	Do.
Bhandara	November	Do.	Do.	Do.	Do.	Do.
Balaghat, plains of	Do.	Do.	Do.	Do.	Do.	Do.
„ Uplands	December	Do.	January	May, early part	1st Feb.	1st June.
Seoni	Jan., early	April and early in May.	January, latter part.	May	Do.	Do.
Mandla	Do.	Do.	Do.	Do.	Do.	Do.
Jubbulpore	Do.	Do.	Do.	Do.	Do.	Do.
Damoh	Do.	Do.	Do.	Do.	Do.	Do.
Saugor	Do.	Do.	Do.	Do.	Do.	Do.
Narsinghpur	Do.	Do.	Do.	Do.	Do.	Do.
Hoshangabad	Do.	Do.	Do.	Do.	Do.	Do.
Betul	Dec. and Jan.	Do.	Do.	Do.	Do.	Do.
Chhindwara	December, middle of.	March and April.	December (end of).	March, end of	15th Jan.	15th April.
Nimar	Do.	Do.	Do.	Do.	Do.	Do.
Raipur	November	Do.	Do.	Do.	Do.	Do.
Bilaspur	Do.	Do.	Do.	Do.	Do.	Do.
Sambalpur	Do.	Do.	Do.	Do.	Do.	Do.

The Government demand is paid for each village in exact proportion to its kharif or to its rabi cultivation, and rents are collected exactly on the same basis. No interest is charged.

BERAR.

BERAR.

Mr. Dunlo

With respect to the proportion borne by the land revenue to the value of the gross produce the information is limited, and not very reliable, owing to the difficulty of ascertaining the actual value of produce per acre. Major Szczepanski estimates that the land revenue in the Wun district bears a proportion of about $\frac{1}{8}$ to the value of the gross produce.

Mr. Beynon, in his Settlement Report on the Chandur taluka (Amraoti district) in 1873, made the following estimate:—

"According to the present market prices the average rate of 13 annas 10 pies is equivalent to a grain rent per acre of 55½ lbs. of jowari, and 3lbs. of cleaned cotton. Taking the average yield per acre of these staples to be 400 seers of jowari and 45 lbs. of cleaned cotton, the average Government demand for the entire taluka under the proposed rates represents about $\frac{1}{14}$ and $\frac{1}{13}$ of the gross produce respectively. This is irrespective of the straw and cotton seed, both valuable commodities; so there can be no doubt, notwithstanding the large increase in revenue, that the average pressure of the proposed settlement will be very light."

The revenue is payable in two instalments, the first of which is due on the 15th January, and the second on the 15th March.

The kharif crops are reaped in December, and the spring crops in February, and the above dates are quite convenient for the agriculturists, many of whom voluntarily pay their whole assessment in January.

IAP. I. QN. 13.

BERAR.

Mr. Jones.

Owing to its small size, its compact area, and its general homogeneity of soil, population, and productions, Berar affords peculiar advantages for the prosecution of some of the inquiries which the Commission propose to themselves to make. I will give an instance. We have in Berar an almost perfect measure of the pressure of our land revenue assessment. Attempts have often been made to arrive at such a measure in other provinces; but I have never seen any which I could regard with even a moderate amount of confidence. In Berar we produce an article, cotton, which supplies such a measure, because—

(*a*) it is produced on a sufficiently large scale:

(*b*) it is all (except what is retained for home consumption, a quantity which, if not accurately ascertained, is certainly comparatively insignificant) exported by railway; and every pound exported is therefore known:

(*c*) our imports are extremely small and are known:

(*d*) the price of cotton is known:

(*e*) the area under cotton is known.

The following extract from the Cotton Report, submitted with my letter No. 3,549 of 23rd August 1878, will show what the result of applying this measure is. It expresses our land revenue in terms of cotton acreage:—

> "The figures showing the value of the crop, which may be implicitly relied on, afford an incontestable proof of the immense importance of the cotton crop to the cultivator. Roughly speaking, less than one-fourth of the cotton crop suffices to pay for the whole land revenue of Berar.

	Quantity.	Value.
1877–78.	Cwt.	Rs.
Exported - - -	1,199,170	2,65,81,602*
Retained for local consumption -	97,523	21,61,760*
		2,87,43,362"

* Calculated at 3 annas and 2 pies per pound.

In making the above extract, my object has not been to show what the pressure of our land revenue is,—to do that accurately an average of several years would have to be taken,—but to point out that we have a measure of its pressure, should the Commission desire to base any inquiry upon it. The field of investigation which such a measure throws open to us seems to me to be capable of being made a very fruitful one. A mere glance at the figures presented above may serve to demonstrate the untrustworthiness of the figures with which Mr. Hyndman startled his readers the other day. And if we might argue that all crops tend to the same money value, and that therefore the value of the crop of the whole cultivated area may be roughly deduced from that of cotton, we should open a wide field of statistical inquiry. I am, of course, aware that such an inquiry would be hazardous, because much of what is produced does not come to market; but in any case there seems to be room for valuable speculation. And I am inclined to think that, owing to the indebtedness of the cultivating classes, the proportion of the total produce of the country that is in fact, though not in appearance, brought into market, and therefore influences market values, is very large indeed. My meaning is, that although much of the produce of the country remains in the cultivator's hands, yet that it remains there after having passed through his banker's books in one shape or another. That, in fact, the bankers get the crops, and re-sell; and that this process has very much the same effect as an actual bringing to market.

The revenue kists cannot be said to bear any fair proportion to the value of the several harvests; for the two kists are equal, whereas the kharif harvest is immeasurably the more important.

The kists are payable as follows: The first on 31st January; the second on the 15th March.

The result is, that the whole demand being in the majority of villages paid from the kharif crop, the cultivator pays half his revenue at a very suitable time, and the other half rather late. Even in villages with a large rabi cultivation the dates are probably sufficiently favourable to the cultivator.

BOMBAY.

BOMBAY.

Colonel Anderson.

The incidence of the land revenue on the cultivated area is given in a table below. The proportion which the assessment bears to the gross produce has been ascertained by a series of careful experiments continued for several years. The printed reports and comments on these experiments are provided for reference. The general result is that the assessment does not amount to one-sixth of the gross produce, and is often no more than one-thirtieth or one-fortieth. Of course it varies much with the season. The universal opinion of the collectors is that the incidence is fair, the rates having been very carefully fixed by the revenue survey as a rent-charge varying with the productive quality of the land. There is no practical difficulty in realizing the land revenue as now assessed, except in years of scarcity. The instalments have been carefully fixed by the Survey Rules (see Nairne's Handbook, p. 121), so that the ryot is called upon to pay immediately after he has harvested and sold his crops. They can be readjusted on the report of the collector, but the unanimous opinion is that they are now judiciously fixed. If an instalment* is not paid within 10 days, a notice is issued for which the defaulter has to pay 4 annas if the amount due does not exceed 5 rupees, and 8 annas if it does.† If payment has to be enforced by law, a fine not exceeding one-fourth of the sum due is leviable, but is generally remitted in years of scarcity. No interest is now charged on instalments overdue.

The following statement shows the incidence of the Government revenue per acre in all districts:—

Collectorate.	Dry Crop.			Garden.			Rice.		
NORTHERN DIVISION.	Rs.	a.	p.	Rs.	a.	p.	Rs.	a.	p.
Ahmedabad - -	1	4	9	5	8	3	4	7	7
Kaira - - -	2	9	1	5	1	2	4	6	11
Panch Máháls - -	1	3	5	2	1	11	2	5	11
Broach - -	4	3	11	6	15	7	5	10	6
Surat - - -	2	10	7	9	8	10	7	13	7
Thana - -	0	3	3	5	6	0	3	3	2
Kolába - - -	0	3	2	5	8	10	4	6	7
Násik - -	0	9	2	1	11	4	2	9	4
Khandesh - -	1	1	10	3	13	3	—		
SOUTHERN DIVISION.									
Poona - -	0	7	11	1	5	9	2	3	5
Ahmednagar - -	0	7	5	2	5	2	1	8	1
Sholapur - -	0	6	8	1	1	6	1	7	4
Satara - - -	0	11	5	3	14	5	3	12	0
Ratnagiri - -	0	6	5	9	12	6	4	3	5
Belgaum - -	0	10	3	3	0	3	2	14	6
Kaladgi - -	0	7	6	1	6	5	1	9	11
Dharwar - -	0	14	3	5	7	0	2	2	5
Kanara - -	0	7	6	8	9	0	2	8	6

Most carefully conducted experiments on crop to ascertain the proportion of assessment to gross produce have been carried on under the orders of Government by the collectors principally during the

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* Nairne's Handbook, p. 122.

† For limitation of increase on revision, Nairne's Handbook, p. 107.

Chap. I. Qn.

Bombay.

Colonel Anderson.

last few years. These experiments have been too few in number, and spread over too short a space of time, to justify any decided general conclusions being arrived at. Besides, the enormous fluctuations in prices of the past four years would upset the conclusions based on the results of any one year. My impression is that we are safe in saying that in fair land in the general run of seasons with ordinary cultivations and average prices, the assessment absorbs less than one-eighth of the gross produce, and in poor land under the same conditions a very much smaller proportion. In many experiments on poor soil the result has shown the assessment to be under 5 per cent. of the gross produce.

There has never been any practical difficulty in realizing the assessment in the Southern Maratta Country as fixed at the first settlement, or as revised since during the past five years, excepting in some parts touched by the famine last year. There some small amount of revenue was remitted and more remained outstanding at the end of the year. No change is necessary in the dates of instalments falling due, which are fixed by Government, and afford ample time for realization of produce before collection. I do not enter further into the question of revenue collection, as the existing orders on this subject will be certainly quoted by the collectors who answer these buestions.

SINDH.

Sindh.

Colonel Ha

The general incidence of land revenue on the cultivated area is about Re. 1-14 per acre.

	Rs.	A.
On rice land - - -	2	12
On wheat land - - -	2	6
On joari and bajri land - -	1	12

The revenue collected may be equivalent to a tenth of the gross produce. The incidence on the various classes of land is fairly distributed. The settlements are all for periods of 10 years only, and they have been introduced at various periods since 1862-63. There has been no practical difficulty in realizing the revenue as now assessed. Instalments of revenue are payable—

For kharif crops.
1st January.
15th February.
1st April.
For rabi crops.
15th May.
15th June.
15th July.

The kharif harvest is well gathered in before any demand is made on account of Government revenue. In the case of the rabi, the necessity of collecting everything within the revenue year unduly hastens instalments which to bear easily on the people should begin about 1st June and end 1st September. Interest on land revenue in arrears is not now charged.

MADRAS.

Madras.

Board o
Revenue.

Incidence of Land Revenue.—A statement is given in the Appendix showing with regard to ryotwari lands—

(1) the area and assessment of cultivable land, including waste;

(2) the area and assessment of land under occupation; and

(3) the area and assessment of land ordinarily cultivated, and the rates of assessment per acre of dry and wet land under each of the above heads.

The subjoined statement shows the rate of assessment per acre of holding, the proportion of wet and dry to total area of holdings, the proportion of waste to culturable area, and the average size of a holding for each district, except Malabar and Canara which have never been surveyed.

N.B.—Second crop charge and water tax have not been taken into account in the "wet" rates shown in column 6. In the Kistna and Godavari Deltas wet land is assessed as if it were dry, and water is charged for at the rate of four rupees an acre.—

Districts.	Population per Square Mile.	Average Size of a Holding.	Average Assessment of a Holding.	Proportion of Dry and Wet Cultivation to Total Cultivation.		Rate of Assessment per Acre of Holding.			Per-centage of Waste.
				Dry.	Wet.	Dry.	Wet.	Total.	
1	2	3	4	5		6			7
		Acres.	Rs. a. p.			Rs. a. p.	Rs. a. p.	Rs. a. p.	
Ganjam - -	182·9	7·7	16 14 11	38	62	1 3 6	2 12 11	2 3 3	13
Vizagapatam - -	117·7	15·8	38 6 8	68	32	1 1 11	5 2 9	2 6 10	13
Godavari - -	255·9	10·9	22 10 9	47	53	1 11 3	2 9 1	2 1 0	34
Kistna - -	180·7	12·2	19 4 1	89	11	1 8 0	2 4 1	1 9 4	19
Nellore - -	162·7	10·8	21 7 11	78	22	1 2 7	5 4 10	1 15 11	34
Cuddapah - -	161·5	8·5	10 14 6	92	8	0 12 0	6 11 10	1 4 5	53
Bellary - -	151·5	16·4	13 8 2	95	5	0 10 0	4 13 9	0 13 2	49
Kurnool - -	130·4	13·3	14 0 6	98	2	0 14 11	6 3 7	1 0 10	35
Madras - -	14,724·1	—	—	—	—	—	—	—	—
Chingleput - -	340·7	8·4	21 14 1	41	59	1 6 1	3 9 7	2 9 7	38
North Arcot -	282·3	3·3	9 1 9	67	33	1 6 2	5 11 1	2 12 1	39
South Arcot - -	360·3	4·1	10 6 8	75	25	1 10 11	5 6 1	2 8 3	40
Tanjore - -	540·1	7·3	28 4 2	25	75	1 3 10	4 13 9	3 13 2	9
Trichinopoly - -	341·5	6·8	9 7 4	84	16	0 14 10	4 2 9	1 6 4	25
Madura - -	238·5	6·2	11 1 2	83	17	1 4 7	4 2 3	1 12 6	31
Tinnevelly - -	327·3	8·4	15 11 0	84	16	0 12 5	8 9 8	1 14 1	8
Coimbatore -	237·3	10·7	12 3 2	96	4	0 14 2	7 5 4	1 2 3	25
Nilgiris - -	66·0	16·5	11 14 4	100	—	0 11 1	2 10 5	0 11 6	13
Salem - -	262·9	6·5	9 9 6	92	8	1 2 1	5 8 6	1 7 7	26
Total - -	226·2	7·8	14 1 0	82	18	1 0 9	4 10 10	1 11 0	33

AP. I. QN. 13.

MADRAS.

Board of Revenue.

Proportion to value of gross produce.—For the portions of the presidency settled by the Settlement Department a statement showing the proportions of the gross and nett produce of lands taken to represent the Government revenue has been furnished by the Director of Revenue Settlement, and is given in the appendix. The principle adopted in the settlement is that the value of the nett produce, after making deductions on account of the vicissitudes of season and the expenses of cultivation, should be equally divided between the ryot and Government. In the earlier settlements, however, viz., those of the Chelambaram Taluq of South Arcot, the Western Delta of Godavari, and the Masulipatam portion of Kistna, the assessment was fixed as nearly as possible at the mean of 30 per cent. of the gross, and two-thirds of the nett value of the produce. Prices having advanced since some of these settlements were completed, the proportions borne by the assessment to the gross produce have diminished. The following statement shows the proportions of assessment to value of gross produce at the commutation rates adopted for the settlement, and at the prices ruling during the last three years preceeding the famine:—

Districts or Portions of the District settled.			Per-centage of Assessments to Value of the Gross Produce at Commutation Rates.	Per-centage of Assessment to Value of the Gross Produce at Ordinary Prices of recent Years.
Cuddapah	Delta – Eastern and Central	Dry.	20	12
	Delta – Western	Dry.	13	8
	Upland	Dry.	12	7
		Wet.	22	14
Kistna	Guntoor Portion	Dry.	15	8
		Wet.	21	13
	Masulipatam Portion	Dry.	18	7
		Wet.	21	12
Nellore	Principal Division	Dry.	18	13
		Wet.	23	17
	Sub-Division	Dry.	18	11
		Wet.	23	17
Cuddapah	Three Taluks, Jammalamadugu	Dry.	15	9
		Wet.	16	11
	Three taluqs, Badvil, &c.	Dry.	14	8
		Wet.	17	11
Kurnool	Proper	Dry.	16	9
		Wet.	16	10
	Pattikonda	Dry.	13	8
		Wet.	17	12
	Cumbum and Markapur	Dry.	13	8
		Wet.	19	13
	Koilkuntla	Dry.	17	12
		Wet.	18	13
Chingleput		Dry.	15	10
		Wet.	20	13
South Arcot, Chelambaram		Dry.	15	8
		Wet.	31	16
Trichinopoly		Dry.	13	6
		Wet.	28	11
Tinnevelly		Dry.	—	-
		Wet.	25	14
Salem	South	Dry.	13	7
		Wet.	21	13
	North	Dry.	12	6
		Wet.	17	10

It must, however, be remembered that the commutation rates represent the price at which the ryots then disposed of, of their grain in their villages, and this was often arrived at by deducting as much as 30 per cent. from the wholesale prices charged by merchants, to allow of a margin for the cost of carriage of grain and the wholesale dealers' profits.

The new settlement rates have been introduced in the districts of Godavari, Kistna, Nellore, Kurnool, Chingleput, Salem, Tinnevelly, and in parts of Cuddapah and South Arcot. They have been sanctioned for Ganjam and Coimbatore, but have not yet been introduced. A succinct account of the principles of the settlement will be found at pages 160–3 of Mr. Maclean's standing information regarding the official administration of the Madras Presidency.

No experiments have been made since the settlements to show the proportions of assessment to produce, with reference to the present outturn, but most of the settlements have been concluded very recently.

Although the proportions shown in the tables above given are only for the average rates of assessment for the whole district, there is no reason to fear that there are many inequalities in individual cases, as one of the special aims of the recent settlements has been the equalization of rates and the removal of anomalies which existed largely under the old settlements.

It is nearly impossible to say what proportion of the value of gross produce represents the Government assessment in most of the districts not yet dealt with by the Settlement Department, numerous changes having, from time to time, been made since the assessment was fixed, and no uniform principle having been adopted at the time of the original settlement. In districts in which there was a rough survey, a fixed share of the gross produce, often exceeding 50 per cent., was taken to represent the Government assessment and commuted into money at rates representing the average selling prices at the time; but the assessments thus fixed having been found to be more heavy than the lands could bear, extensive reductions had to be made, and this was effected not on a fresh calculation of produce and prices, but by a general per-centage of reduction. Detailed information regarding the manner in which the old assessments were fixed in each district will be found in the collectors' replies, but they do not admit of being tabulated here.

Assuming that the rates of produce reported by collectors, with reference to Question 3, represent the average production of the land in each district, the proportion of the average rate of assessment to the value of gross produce may be estimated as follows:—

		Per-centage of assessment to value of gross produce.
Ganjam	Dry	8
	Wet	14
Vizagapatam	Dry	10
	Wet	18
Bellary	Dry	9
	Wet	15
North Arcot	Dry	11
	Wet	11
Tanjore	Dry	8
	Wet	13
Madura	Dry	9
	Wet	9
Coimbatore	Dry	8
	Wet	16
Malabar	Wet	12

The Board do not attach much value to the above estimate as everything depends upon how far the collector's estimate of outturn can be relied on as representing the *average* of the district, but it is given for what it is worth.

Realization of Revenue.—No difficulty has been experienced in the realization of the revenue under the new settlements, nor even under the old ones, since reductions were granted, especially between 1854 and 1858, wherever it was found that the assessments were higher than the land could fairly bear. The high prices which have ruled of late years have enabled the ryots to pay up their dues with ease. The increase in the number of coercive processes in the realization of the Government demand is not due to the pressure of the assessment. The subject will be alluded to in reply to Question 14.

The ryotwar revenue and the Inam quit-rents are paid according to instalments fixed by the Board of Revenue, and shown below:—

Districts.	Proportion of Annual Tax payable each Month.								
	November.	December.	January.	February.	March.	April.	May.	June.	Total.
	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.
Ganjam	–	4	4	4	4	–	–	–	16
Vizagapatam	–	4	4	4	4	–	–	–	16
Godavari	–	4	4	4	4	–	–	–	16
Kistna	–	4	4	4	4	–	–	–	16
Nellore	–	2	2	2	4	4	2	–	16
Cuddapah	–	4	4	4	4	–	–	–	16
Kurnool	2	4	4	4	2	–	–	–	16
Chingleput	–	2	2	4	4	2	2	–	16
Bellary	–	2	2	4	4	2	2	–	16
North Arcot	2	2	4	4	2	2	–	–	16
South Arcot	2	2	2	4	4	2	–	–	16
Tanjore. Kar	3	6	7	–	–	–	–	–	16
Tanjore. Samba	–	–	–	2	3	5	4	2	16
Trichinopoly	–	4	4	4	4	–	–	–	16
Madura	–	2	2	2	2	4	4	–	16
Coimbatore	2	2	4	4	2	2	–	–	16
Nilgiris	2	2	4	4	2	2	–	–	16
Tinnevelly	–	2	2	4	4	4	–	–	16
Salem	2	2	4	4	2	2	–	–	16
South Canara	–	–	4	4	4	2	2	–	16
Malabar	2	2	4	4	2	2	–	–	16

They were fixed as lately as 1876, after a careful consideration of the season, for the principal harvests of each district with a view to enable the ryots to dispose of their produce before paying the Government assessment. No complaints have reached the Board to show that the dates fixed are in any way inconvenient or disadvantageous to the ryots.

The peishcush of zemindaris is paid according to instalments fixed in the original sanads.

Interest charged on land revenue in arrear?—Interest, at the rate of six per cent. per annum, is charged on land revenue arrears under Madras Act II. of 1864.

STATEMENT showing the RYOTWARI CULTURABLE AREA and the INCIDENCE of ASSESSMENT per ACRE of LAND.

Districts.	Land in Occupation.								
	Dry.			Wet.			Total.		
	Extent.	Assessment.	Rate per Acre of Land.	Extent.	Assessment.	Rate per Acre of Land.	Extent.	Assessment.	Rate per Acre of Land.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
	Acs.	Rs.	Rs. a. p.	Acs.	Rs.	Rs. a. p.	Acs.	Rs.	Rs. a. p.
Ganjam	1,16,092	1,41,721	1 3 6	187,771	5,27,818	2 12 11	303,863	6,69,539	2 3 3
Vizagapatam	53,399	59,786	1 1 11	25,310	1,31,226	5 2 9	78,709	1,91,012	2 6 10
Godavari	419,994	7,15,592	1 11 3	297,238	7,64,570	2 9 1	717,232	14,80,162	2 1 0
Kistna	1,611,715	24,16,871	1 8 0	194,216	4,38,407	2 4 1	1,805,931	28,55,278	1 9 3
Nellore	773,750	9,01,692	1 2 7	193,040	10,24,733	5 4 10	966,790	19,26,425	1 15 11
Cuddapah	1,187,909	8,93,074	0 12 0	114,958	7,75,026	6 11 10	1,302,867	16,68,100	1 4 5
Bellary	2,376,109	14,92,400	0 10 0	114,233	5,55,481	4 13 9	2,490,342	20,47,881	0 13 2
Kurnool	1,179,065	11,02,876	0 14 11	27,341	1,70,227	6 3 7	1,206,406	12,73,103	1 0 10
Chingleput	234,942	3,24,109	1 6 1	286,093	10,30,156	3 9 7	521,035	13,54,265	2 9 7
North Arcot	443,899	6,16,464	1 6 2	206,060	11,73,009	5 11 1	649,959	17,89,473	2 12 1
South Arcot	964,353	16,24,948	1 10 11	285,153	15,16,064	5 6 1	1,249,506	31,41,012	2 8 3
Tanjore	298,913	3,71,327	1 3 10	746,399	36,27,709	4 13 9	1,045,312	39,99,036	3 13 2
Trichinopoly	829,062	7,77,185	0 14 10	136,127	5,68,097	4 2 9	965,189	13,45,282	1 6 4
Madura	745,660	9,59,680	1 4 7	157,387	6,51,840	4 2 3	903,047	16,11,520	1 12 6
Tinnevelly	1,177,015	9,19,147	0 12 5	191,892	16,51,973	8 9 8	1,368,907	25,71,120	1 14 1
Coimbatore	2,225,473	19,78,668	0 14 2	89,812	6,58,901	7 5 4	2,315,285	26,37,569	1 2 3
Nilgiris	88,464	61,349	0 11 1	1,274	3,382	2 10 5	89,738	64,731	0 11 6
Salem	1,133,873	12,80,608	1 2 1	95,988	5,30,981	5 8 6	1,229,861	18,11,589	1 7 7
South Canara	—	—	—	—	—	—	—	—	—
Malabar	403,395	6,36,436	1 9 3	387,169	11,65,237	3 0 1	790,564	18,01,673	2 4 6
Total	16,263,082	1,72,73,933	1 1 0	3,737,461	1,69,64,837	4 8 8	20,000,543	3,42,38,770	1 11 4

P.I.Qn. 13.

ADRAS.

Board of Revenue.

AVERAGE RYOTWARI CULTIVATION during the FOUR YEARS ending 1875–76, and INCIDENCE per ACRE of CULTIVATED LAND.

—	Dry.			Wet.			Total.		
	Extent.	Assessment.	Rate per Acre.	Extent.	Assessment.	Rate per Acre.	Extent.	Assessment.	Rate per Acre.
	Acres.	Rs.	Rs. a. p.	Acres.	Rs.	Rs. a. p.	Acres.	Rs.	Rs. a. p.
Ganjam - -	103,800	1,34,941	1 4 9	171,766	5,01,555	2 14 8	275,566	6,36,496	2 4 11
Vizagapatam - -	50,211	54,004	1 1 2	23,460	1,23,808	5 4 5	73,671	1,77,812	2 6 7
Godavari - -	250,332	5,11,540	2 0 8	277,143	7,29,692	2 10 1	527,475	12,41,232	2 5 8
Kistna - - -	1,433,311	21,49,838	1 8 0	174,109	4,63,301	2 10 7	1,607,420	26,13,139	1 10 0
Nellore - -	590,431	7,30,986	1 3 9	165,891	8,58,658	5 2 10	756,322	15,89,644	2 1 7
Cuddapah - -	1,114,487	8,71,197	0 12 6	99,574	6,76,787	6 12 9	1,214,061	15,47,984	1 4 5
Bellary - -	2,293,323	14,54,036	0 10 1	101,526	5,03,729	4 15 4	2,394,849	19,57,765	0 13 1
Kurnool - - -	1,172,146	10,96,955	0 14 11	25,699	1,63,261	6 5 7	1,197,845	12,60,216	1 0 9
Madras -	—	—	—	—	—	—	—	—	—
Chingleput - -	168,387	2,44,230	1 7 2	243,883	9,04,817	3 11 4	412,270	11,49,047	2 12 7
North Arcot -	378,148	5,32,159	1 6 6	184,812	10,68,011	5 12 5	562,960	16,00,170	2 13 5
South Arcot - -	794,611	13,64,129	1 11 5	267,397	14,36,849	5 5 11	1,062,008	28,00,978	2 10 2
Tanjore -	233,511	2,92,165	1 4 0	711,434	35,00,604	4 14 8	944,945	37,92,769	4 0 2
Trichinopoly - -	674,859	6,60,915	0 15 8	129,191	5,45,523	4 3 6	804,050	12,06,438	1 8 0
Madura - -	650,237	8,55,774	1 5 1	138,543	5,86,537	4 3 9	788,780	14,42,311	1 13 3
Tinnevelly - -	811,930	7,31,538	0 14 5	158,451	15,06,637	9 8 1	970,381	22,38,175	2 4 10
Coimbatore - -	1,958,428	17,74,663	0 14 5	82,863	6,14,488	7 6 8	2,041,291	23,89,151	1 2 8
Nilgiris - - -	48,562	30,393	0 10 0	30	67	2 3 9	48,592	30,460	0 10 0
Salem - - -	1,070,924	12,27,672	1 2 4	86,267	4,86,529	5 10 3	1,157,191	17,14,201	1 7 8
South Canara -	—	—	—	—	—	—	—	—	—
Malabar - -	393,936	6,21,800	1 9 3	386,366	11,64,143	3 0 2	780,302	17,85,943	2 4 7
Total -	14,191,574	1,53,38,935	1 1 3	3,428,405	1,58,34,996	4 9 10	17,619,979	3,11,73,931	1 12 3

RAJPUTANA.

JPUTANA.

tain Law.

or Powlett.

Spencer.

Captain Law, Alwar.—The rent-rates on which the assessment was based will be found at page 187 of the *Alwar Gazetteer*. Calculating from these, which will give an approximate, though not a correct, average, it would appear that the mean rate is about Rs. 2-12-9. The rates for irrigated land vary a great deal, but give an average of Rs. 4-0-6; those of unirrigated land one of about Rs. 1-9-7. The land revenue usually equals two-thirds of these rates. Major Powlett says (page 184): "The portion of the net assets fixed as "the State's share was generally two-thirds. But "where three-fourths or more had been paid without "apparent difficulty, three-fourths were determined." The sum paid to the State by the landholder would be two-ninths of the gross produce.

The incidence on the various classes of land is fairly distributed. The assessment was fixed in 1876; but it was collected in some instances at the new rates before this date.

There has been no practical difficulty in realizing the land revenue as now assessed till after the failure of the rains in 1877.

The revenue is paid in two instalments in each season. The dates they become due are—in the autumn, "Mangsir badi ekum," say about the middle of November and a month later; and in the spring, "Baisákh badi ekum," say about the end of April or beginning of May and a month later. They are so arranged as to admit, as far as possible, of the zamindar selling his crops or collecting his rents from his cultivators before his first instalment becomes due. And the several instalments bear a fair proportion to the value of the several harvests from which the revenue or rent has to be made good.

A rate of interest at Rs. 3-2 per cent. is charged on land revenue in arrears.

Major Powlett, Kotah.—Paragraph 13.—I cannot yet give the general incidence of rent on land for the whole Kotah State; but for two parganas which have been surveyed and assessed recently the unirrigated is approximately Rs. 2-10 per acre. The irrigated may be set down as approximately Rs. 10.

The price cultivators get for their crops is so much below the town market rates, that I believe the above to represent about one-third of the gross-produce on both irrigated and unirrigated; but at present I feel little trust in the estimate of the land's productive power. Rent-rates in Kotah are very numerous. Since however they have prevailed for 100 years, it was thought inexpedient to alter them much at the Ryotwari settlement now being made, but only to readjust them. It was found in most villages that some persons did not pay nearly the full rates properly due on their lands, while the most helpless paid more than the full rates. By applying the prevailing rates, about which there could be no doubt, as every cultivator's account is with the State, not with a landlord, reduction was given in nearly a third of the holdings; although the total revenue demand was raised 7 per cent.

There are three revenue instalments in Kotah. The first, of 25 per cent., is due at the beginning of November, a month before the kharif grain can be sold; the second, of 45 per cent., at the beginning of February; and the balance in May. In Boondee, where after each harvest the cultivated land is roughly measured before the demand is made, the rents are taken in a lump sum after the crops are gathered; and there, I am told, arrears are small, while in Kotah they are considerable. Interest is charged on arrears at 12 per cent. per annum; but it is remitted in many cases when the chance of getting it is remote; and it never is allowed to exceed the principal.

Mr. Spencer, Bhartpur.—The average land revenue collected from the cultivated area, which is estimated at bigahs 1,692,892, is Rs. 1-3-9 per bigah, and for the different classes of land it is as follows: For well land Rs. 3 and Rs. 4, irrigated land Rs. 2 and Rs. 2-8, rain land Rs. 1, Rs. 0-14, Rs. 0-12, and Rs. 0-8 per bigah. The total land revenue, which amounts to Rs. 20,16,584-3-0, represents the one-sixth portion of the whole produce of the State. This rental was fixed after much reflection from data prepared during the minority, and can be collected with ease; the inhabitants of a few of the villages who complained that the assessment was a heavy one have been placed under the *khám* system. The whole of the revenue is paid in four instalments, thus—kharif, two instalments, October and November; and rabi, two instalments, April and May.

CENTRAL INDIA.

CENTRAL INDIA.

Col. Osborne.

Colonel W. Osborne, Bhopal.—"The revenue of the following classes of land is:—

1. Kalmat or wheat land,		2½	Rs. per acre.	Dependent on rainfall.
2. Bhamar, jowar bajra land		1½	"	
3. Siar or kodû, tilli land,		1	"	
1st class Chahi, rice, sugar-cane, and opium land		20	"	watered by tanks.
2nd class	do.	10	"	watered by wells.
3rd class	do.	6	"	watered by rivers.

On opium land the cultivators' profits are two-thirds on other lands half. There is no difficulty in collecting the revenue. It is realized in four equal instalments, viz., in October, after cutting makka and rice crops; in December, after reaping jowar crops; in February, after opium and sugar-cane crops; and in April, after wheat and gram crops have been harvested. No interest is charged by the State on land revenue due; the cultivators, when necessary, borrow from bankers, so that there are hardly any arrears."

Lieut.-Col. Bannerman.

Lieutenant-Colonel Bannerman, Baghelkhand.—"The land revenue is very little in excess of the gross rental; if the latter is greater than the former, it is from 7 to 15 per cent., the average being say 10 per cent. The average proportion of revenue to the value of the gross produce, inclusive of cultivators' charges, may be estimated roughly at one-fifth.

The assessment was fixed in 1875 and is still in force; there has been no difficulty in realizing it in ordinary years.

The instalments of revenue are payable *four* times during the year:—

1st.—15th Aghani Soodi—December.
2nd.—15th Magh Soodi—February.
3rd.—15th Chait Soodi—April.
4th.—15th Baisakh Soodi—May,

corresponding to a great extent with the periods of harvest. Each instalment is 4 annas, or one-fourth of the revenue for the year, and on the whole they bear a fair proportion to the value of produce.

In former days from 12 up to 25 per cent. was charged on arrears, at present no such charge is made."

Mir Shahama Ali.

Mir Shahamat Ali, Rutlam.—"The rate of revenue on cultivated land on the average is Rs. 1–12–0, and on cultivated and culturable 14 annas per beegah (2 beegahs=1 acre). The proportion of revenue to the value of gross produce at the prevailing market rates is nearly one-fifth, both of dry and irrigated land. This is a fair adjustment of revenue, considering the proceeds of the cultivators' land. The assessment was re-fixed in 1877–78. No difficulty is apprehended in realizing the revenue as assessed. The revenue is payable by four instalments, on dates noted below.* The first instalment is suited to the proceeds of mukka, the second of jowari, the third of opium, and the fourth of wheat. A period of 15 days is allowed within which each instalment should be fully paid. Beyond it, it is as a rule chargeable with Rs. 2 interest. They bear a fair relation to the ordinary periods of harvests, as well as to their values. The last instalment is made higher to enable an easy recovery of arrears, if due, for the preceding instalments, as well as that instalment itself."

Pundit Suroo Narain.

Pundit Suroop Narain, Manpur.—"The Government rates on cultivated land in Manpur are: for dry land per beegah Rs. 1–2–0, for wet land per beegah Rs. 6–10–0. Some of the Malgoozars in settled villages sublet their holdings on increased rates ranging in the case of dry land to Rs. 2–4–0, and in that of wet land to Rs. 7 or 8. This increase of rates is a mere private arrangement and not recognized by Government, and can last only at the will of the parties. The Bheels pay at the rate of Rs. 3 per plough on dry, and Rs. 4 per beegah on wet land. The rates in Manpur are much lighter than those prevailing within bordering native territory, where the rate on dry land goes up as high as Rs. 3 per beegah, and from Rs. 8 to 20 on wet land. The assessment of the seven settled villages was fixed, as already stated, for 20 years in 1867. The rates being so easy, no difficulty is felt in realizing the revenue, which is paid promptly by the people in ordinary years. Three-fourths of the Government demand is realized in May after the wet crops (including the opium) are harvested, and one-fourth in December after the harvesting of jowari, the chief item of the dry crops; no better arrangement of instalments could be made. Revenue seldom falls in arrears, and whenever it does, in case of poorer Bheels, no interest is charged. Compared to rates in bordering native territory, those in Manpur can admit of increase; but the convenience enjoyed by cultivators in native territory, in the shape of getting suspensions and remissions of revenue and advances for seed and cattle, being wanting here, it would not be advisable for the present to make any change in existing revenue rates in Manpur."

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* 11th September, 4 annas; 9th December, 4 annas; 8th March, 6 annas; 10th May, 2 annas.

HYDERABAD.

INCIDENCE of LAND REVENUE on the CULTIVATED AREA.

The following Tabular Statement is prepared from the Administration Report for 1284 Fasli.

Number.		District.	Cultivated Area in 1284 Fasli.								
			Wet.			Dry.			Total.		
			Acres.	Assessment in British Rupees.	Rate per Acre.	Acres.	Assessment in British Rupees.	Rate per Acre.	Acres.	Assessment in British Rupees.	Rate per Acre.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
				Rs.	Rs. A. P.		Rs.	Rs. A. P.		Rs.	Rs. A. P.
1	Telingana.	Maydak - -	48,212	5,27,187	10 13 6	89,304	3,35,971	3 12 3	137,516	8,63,158	6 4 5
2		Indur - -	36,383	8,22,100	22 9 7	164,081	4,19,163	2 8 10	200,464	12,41,263	6 3 0
3		Yalgundal -	111,041	10,49,297	9 7 2	322,415	5,06,764	1 9 1	433,456	15,56,061	3 9 5
4		Sirpur Tandur -	2,406	14,129	5 14 0	179,594	1,23,637	0 11 0	182,000	1,37,766	0 12 1
5		Khammam -	70,197	9,54,547	13 9 7	360,621	4,98,323	1 6 1	430,818	1,45,287	3 5 11
6		Nalgunda - -	41,546	4,03,670	9 11 5	432,792	4,94,016	1 2 3	474,338	8,97,686	1 14 4
7		Nagar-Karnul -	48,310	7,97,931	16 8 3	275,969	2,43,513	0 14 1	324,279	10,41,444	3 3 4
		Total Telingana	358,095	45,68,861	12 12 2	1,824,776	26,21,387	1 6 11	2,182,871	71,90,248	3 4 7
8	Maratwadi.	Aurangabad -	43,384	1,98,482	4 9 2	1,378,703	12,65,733	0 14 9	1,422.087	14,64,215	1 0 5
9		Beed - -	21,670	70,704	3 4 2	1,475,822	9,70,647	0 10 6	1,497,492	10,41,351	0 11 1
10		Parbhani - -	41,605	1,04,514	2 8 2	964,978	9,04,446	0 14 11	1,006,583	10,08,960	1 0 0
11		Bidar - -	6,893	69,811	10 2 0	376,016	6,74,048	1 12 8	382,909	7,43,859	1 15 0
12		Nander - -	10,019	24,858	2 7 8	834,153	11,27,119	1 5 7	844,172	11,51,977	1 5 10
13		Naldrug -	11,623	48,977	4 3 5	492,607	3,03,924	0 9 10	504,230	3,52,901	0 11 2
14		Gulbarga - -	11,771	1,98,998	16 14 6	375,015	5,66,951	1 8 2	386,786	7,65,949	1 15 8
15		Shorapur -	6,307	65,797	10 6 10	557,185	6,25,493	1 1 11	563,492	6,91,290	1 3 7
16		Raichur -	14,667	75,259	5 2 1	782,003	7,16,942	0 14 8	796,669	7,92,201	0 15 10
17		Lingsugur -	8,322	55,012	6 9 9	868,562	7,02,382	0 12 11	876,884	7,57,394	0 13 10
		Total Maratwadi	176,260	9,12,412	5 2 10	8,105,044	78,57,685	0 15 6	8,281,304	87,70,097	1 0 11
		GRAND TOTAL	534,355	54,81,273	10 4 1	9,929,820	1,04,79,072	1 0 11	10,464,175	1,59,60,345	1 8 4

At first sight it appears from the foregoing statement that in the Telingana country the rates of assessment for both wet and dry lands are somewhat high. This, however, is not actually the case. The reason why these rates appear high may be explained by the fact that so recently as 12 years ago the *Batai* (payment-in-kind) system prevailed in the province of Telingana, and hence no efforts were made to get at the correct area of the cultivated lands of each village. So long as Government received a certain share of the produce of the cultivated lands, it did not much matter what the area of that land was. No such accurate survey seems to have been made in the Telingana country in times past as appears to have been made in the Maratha country. It is only since money payments were introduced in Telingana that anything like an attempt to ascertain the area of each field has been made. The result is that the areas thus obtained in a rough hap-hazard way are exceedingly inaccurate, and are not reliable. But as these areas have been recorded by the Patels and Patwadis of the villages, it naturally follows that the error is to the advantage of the ryots. This fact has been ascertained in two ways; *first*, by a rough survey executed through the agency of the Patels and Patwadis; and, *secondly*, by a systematic survey executed by trained officers. The result of the first survey showed an increase of about 50 per cent. over the previously recorded area of wet land, and about 75 per cent. over that of dry land. The results arrived at by the other survey are still more striking, being an increase of 393 per cent. in dry land, and 144 per cent. in wet land, in the nine villages surveyed. The rate of assessment for dry land, which, calculated upon the Patwadis' recorded area, stood at Rs. 3-3-10 per acre, is now reduced to Rs. 0-10-8 per acre. For wet land where it formerly stood at Rs. 27-10-3 per acre, it is now reduced to Rs. 11-4-6 per acre. The following statement, prepared by the Settlement Officer of the Maydak district for the nine villages mentioned as having been surveyed under his superintendence, affords detailed information with respect to this difference:—

	Name of Village.	Dry Cultivation.								Wet Cultivation.							
		Area in Acres.				Increase in Area.		Per-centage Increase in Area.		Area in Acres.				Increase in Area.		Per-centage increase in Area.	
		Former.		Present.						Former.		Present.					
1	2	3		4		5		6		7		8		9		10	
1	Iksanpilli -	61	22	408	36	347	14	568	0	58	31	135	25	76	34	131	1
2	Korlapilli -	16	21	158	12	141	31	881	0	25	22	90	0	64	18	256	0
3	Hasan Mahomadpali.	38	13	409	1	451	28	1,186	0	38	2	73	16	35	14	92	4
4	Karampali -	220	25	865	34	645	9	293	0	25	2	43	3	18	1	72	0
5	Andhasampali	37	31	124	13	86	22	232	0	67	31	158	23	90	32	134	11
6	Chrital - -	137	4	437	27	300	23	218	39	13	22	47	0	33	18	253	33
7	Boramatpali -	63	31	408	28	344	37	546	1	45	4	124	32	79	28	175	22
8	Arkala - -	24	1	126	29	102	28	425	0	73	15	159	36	86	21	117	32
9	Budhipali -	31	14	91	4	59	30	190	13	9	0	40	31	31	31	344	17
	Total -	631	2	3,111	24	2,480	22	393	4	356	9	873	6	516	37	144	37

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Maulavi Shekh Ahmad Husen, Talukdar of the suburban district, bears testimony to the difference between the correct area and that entered in the Patwadis' papers, by bringing forward a statement prepared from the survey records about the Patlur Taluka, showing the results obtained by survey, an abstract of which is given below :—

No.	Name of Village.	Old.	Present.
		Bighas.	Bighas.
1	Rikupal - -	210	757
2	Inor - - -	259	506
3	Yechuram - -	193	573
4	Balkal - - -	133	890
5	Turmal - - -	168	391
6	Madhuram - -	55	129
	Total - -	1,018	3,246

In the taluka of Tekmal about fourteen villages have been surveyed, and the result obtained has been a considerable excess of the cultivated area over that recorded. In wet land that area exceeded by 263 per cent., and in dry about 163 per cent. Mr. Swami Rao, Sadr Talukdar, had about fifteen villages of the Kalwakarti taluka, in the Nagar-Karnul district, measured, and the result was that the actual area exceeded that recorded by 41·3 per cent.

In Mouza Chinthalpilli, taluka Kullubgur, the irrigated land, as shown in the Kulkarni's papers, was only 39 acres, while by the survey it was ascertained to be 66 acres, being an excess of 67·64 per cent. In this same village the lands under dry crops according to the Kulkarni's returns were 216 acres, whereas they have been ascertained by the survey to be 402 acres, showing an excess of 85·56 per cent.

Taking the whole Telingana province, the discrepancy in the area of cultivated lands may not perhaps be so considerable as that which is apparent in the Medak district. This much, however, may be safely stated, that, taking the Telingana country as a whole, the excess under the head of wet lands will probably amount to about 30 per cent. over the recorded area, and the dry lands to about 50 per cent. Calculating on these data, it may be assumed that the average rate of assessment for wet lands is Rs. 9–13–0 per acre, and of dry land Rs. 0–15–4. Under Mogul and Maratha rule, the Maratwadi country was frequently surveyed, and therefore no very great discrepancies exist between the true and the recorded area of each village. The excess in this case may be safely put down at about 15 to 20 per cent. of the recorded area.

It is difficult to state with any degree of accuracy the proportion which such revenue bears to the value of the gross produce, as to do this we must first ascertain the exact gross produce of the land. Now, nothing can be more difficult than to ascertain accurately the gross produce of the different descriptions of soil throughout the country; and, even supposing that this was done one year, the outturn of the next season may upset all our calculations, and render a fresh beginning necessary. The influences at work are so various, and so little to be depended upon for uniformity of operation; the character of the season, the degree of labour spent on the soil, and other contingencies affecting the out-turn of cultivation are so numerous and variable, as to make it exceedingly difficult to arrive at an estimate sufficiently correct to answer our purpose on all occasions. It must be remembered also that economical conditions are constantly changing; that the market value of produce varies from year to year; and that therefore it would be difficult, under any circumstances, to lay down what proportion the revenue bears to the value of the gross produce. I had some experiments conducted, however, under my own supervision, in 1285 Fasli (1875), and some by the district officers in 1286 Fasli, in order to ascertain the out-turn per bigha of the different varieties of crops. Some of the talukdars have also examined experienced cultivators on the subject.

Subjoined is a rough estimate, based on the returns of produce submitted by the talukdars, which will afford an idea of the proportion that the average assessment bears to the produce of all the districts :—

District.	Value of total Food Produce in British Rupees.	Value of other Crops in British Rupees.	Total value of Produce in British Rupees,	Revenue, inclusive of Cesses in British Rupees.	Proportion of Revenue to value of Produce.
1.	2.	3.	4.	5.	6.
	Rs.	Rs.	Rs.	Rs.	
Maydak - - - -	51,38,380	5,44,073	56,82,453	8,63,158	6·58
Indur - - - -	43,84,994	11,66,228	55,51,222	12,41,263	4·47
Yalgundal - - - -	74,49,824	11,05,131	85,54,955	15,56,061	5·49
Sirpur-Tandur - - -	11,12,087	8,85,272	19,97,359	1,37,766	14·50
Khammam - - - -	61,80,644	10,41,612	72,22,256	14,52,870	4·97
Nalgunda - - -	39,87,285	17,19,221	57,06,506	8,97,686	6·36
Nagar-Karnul - - -	43,99,584	12,55,185	66,54,769	10,41,444	5·43
Total -	3,26,52,798	77,16,722	4,03,69,520	71,90,248	5·62
Aurangabad - - - -	1,42,52,078	16,78,278	1,59,30,356	14,64,215	11·87
Beed - - -	1,39,17,190	33,08,531	1,72,25,721	10,41,351	16·54
Parbhaini - - - -	72,93,791	37,51,047	1,10,44,838	10,08,960	10·9
Bidar - - - - -	30,94,746	11,76,730	42,71,476	7,43,859	5·74
Nanded - - -	47,26,246	38,24,716	85,50,962	11,51,977	7·42
Naldrug - - - -	25,77,452	16,88,777	42,66,229	3,52,901	12·08
Gulbarga - - -	26,57,701	7,91,122	34,48,823	7,65,949	4·5
Shorapur - - - -	41,66,399	19,41,054	61,07,454	6,91,290	8·69
Raichur - - - -	36,13,079	18,40,997	54,54,076	7,92,201	6·88
Lingsugur - - -	45,35,044	18,21,437	63,56,481	7,57,394	8·12
Total -	6,08,33,726	2,18,22,690	8,26,56,416	87,70,097	9·42
GRAND TOTAL -	9,34,86,524	2,95,39,412	12,30,25,936	1,59,60,345	7·71

From this statement, as well as from the results arrived at by personal experiments, it is apparent that the proportion the rate of assessment bears to the produce is higher in the case of wet cultivation than in that of dry. The reason for this is to be found in the fact that the rates of assessment in the former case include both the land tax and water cess, and that the yield from irrigated land is considerably in excess of that from dry-crop lands. If one might hazard a conjecture, I would venture to state that, in

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my opinion, founded on personal experiments and on inquiry, the proportion that the average assessment bears to the average produce in the dry-crop cultivation of the Maratha country, in ordinary years, may be set down at about $\frac{1}{9}$, and in the Telingana districts, where wet cultivation is chiefly resorted to, at about $\frac{1}{5}$.

In the Maratha districts the revenue instalments are made payable at the following dates:—

		Rs.		
15 Azur=26th October	- -	0	4	0
15 Bahman=23rd December	-	0	8	0
15 Farvardi=21st February	-	0	4	0

The first instalment covers the kharif crop, the second covers the kharif and rabi, and the third the rabi. Some changes will have to be made in the periods fixed for the realization of the revenues by and by. In the talukas which have come under settlement the revenues are realized as follows:—

The first instalment on or about the 15th of Dai, corresponding with the 24th of November, when the kharif crop is harvested.

The second instalment on or about the 15th of Farvardi, corresponding with the 21st of February, when the rabi crop is harvested.

In villages where no rabi or later crops are grown, the tehsildars are directed to recover the full amount of the revenue due in a lump sum and at once, when the kharif is harvested. But in villages where both kharif and rabi crops are grown, the realizations are made by equal instalments on the dates last mentioned.

In the Telingana districts the revenue instalments are made payable at the following dates:—

		Rs.		
15 Azur=26th October	- -	0	3	0
15 Dai=24th November	- -	0	3	0
15 Ardibehest=24th March	-	0	4	0
15 Amardad=26th June	- -	0	6	0

The first instalment covers the kharif harvest. (The jowar crop is not harvested at this time of the year, but all other crops are.) The second covers the abi harvest; the third the rabi harvest; and the fourth the rabi.

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CHAPTER I.—QUESTION 14.

What is the average price of land per acre? What amount of land on an average is sold every year for arrears of revenue and for decrees of court? What quantity of land has been transferred in your district to non-agricultural and non-resident landlords.

PUNJAB.

Major Wace.

PUNJAB.

In the Punjab, in order to keep up to date the record of rights prepared at settlement, every mutation of rights is reported by the patwári (village accountant) of the village in which it occurs to the district revenue authorities, and after a summary inquiry as to the truth of the report, the result is recorded in a brief proceeding, which is filed in the district office with the records, and the village accountant is directed to make a corresponding alteration in the rent roll (jamábandi) of the year. This system has been in force in the Punjab for 20 years past, and the statistics of each year are incorporated for the whole province in statements appended to the annual revenue report.

Accordingly, with a view to furnishing a reply to this question, I have compiled and append the returns of the eight years commencing 1869–70 and ending 1876–77. The form of the annual returns was changed from 1874–75; and in that year the total mortgages then existing were also ascertained. These returns contained—

A.—Statement of transfers (sales and mortgages) during the five years 1869–70 to 1873–74.

B. Statement of sales for the three years 1874–75 to 1876–77.

C. Statement of mortgages and redemptions of mortgage for the same three years.

D. A statement in which the total mortgages existing on 31st March 1874 are compared with those existing on 31st March 1877.

The most important conclusions to be drawn from these statements may be briefly summarised thus:—

Reference to statements appended.	Transactions.	Total number of Contracts.	Total average thereof.	Consideration paid.			Per-centage which the yearly revenue of the Lands transferred bears to the total Revenue of the Province.	
				Total Rs.	Average amount per acre.	How many times the amount of the annual Revenue of the Lands transferred.	For the whole period.	For one year.
A.	Sales of the 5 years ending 1873–74 Average per annum -	25,970 5,194	433,133 86,628	60,90,490 12,18,098	14	22	1·22	0·24
B.	Sales of the 3 years ending 1876–77 Average per annum -	20,498 6,833	270,348 90,116	51,04,608 17,01,536	19	27	0·84	0·28
	Mortgages of the 5 years ending 1873–74 - - - - - Average per annum -	68,235 13,647	839,572 167,914	1,14,26,998 22,85,399	14	16	3·30	0·66
C.	Mortgages of the 3 years ending 1876–77 - - - - - Average per annum -	53,593 17,864	592,881 197,627	95,20,324 31,73,441	16	19	2	0·66
C.	Redemptions from mortgages during the same period - - Average per annum -	9,548 3,183	149,198 49,733	11,73,626 3,91,209	8	11	0·5	0·16
D.	Total mortgages outstanding in the Punjab on 31st March 1874 -	139,902	13,14,146	1,87,06,396	14	15	—	6
D.	The same on 31st March 1877 -	183,974	17,57,829	2,70,53,094	15	17	—	7

Nearly the whole of the land which is the subject of these transfers is cultivated land; very little waste is included.

The conclusion indicated is, that taking the province as a whole, neither sales nor mortgages occur in such numbers as to give ground for anxiety concerning the general prosperity of the agricultural classes. I believe the returns to be fairly complete and reliable; but even were a wide margin allowed for short registration, the same conclusion concerning the general prosperity of the agricultural classes would hold. The most incomplete portion of the returns is probably that of the total mortgages outstanding on 31st March 1874 and 1877.

According to these returns the total lands encumbered with mortgages amount to only 7 per cent.* of the province, and the average annual sales and mortgages together amount to only 1 per cent.

There is also the strongest evidence of a steady rise in the value of land; evidence which is confirmed by the common opinion of the revenue officers of the province, and by many of the records of our administration. For instance, in the Administration Reports of the years 1861–62 and 1862–63 † it was noticed with satisfaction that the value of land was steadily rising, the sale value then standing at so high an average as 7 years' purchase of the Government demand; the mortgage value was also said to average 8¼ years' purchase. In the same years the aggregate price of the sales reported was about 2¼ lakhs, and of the mortgages 3¾ lakhs. Compare these figures with the results shown in the table above given. The sums paid for sales have averaged during the past three years 17 lakhs, and for mortgages 39 lakhs; while prices averaged 27 years' purchase of the Government demand for sales, and 19 years' purchase for mortgages. Say, if you will, and no doubt with much truth, that the registration of transfers is now much more perfect than before, nevertheless the average values are probably not far from the truth; and even after doubling or trebling the aggregate reported transfers of 1861–62 and 1862–63, the proof of the rise in the value of the land, and of the increasing confidence with which all classes regard it as a source of profit, will hardly be materially affected.

Between the value of irrigated and unirrigated land, and also between that of land which owing to its situation near a town or village site is usually constantly manured and land not so advantaged, there is of course the widest difference. It is to be regretted that the annual returns make no attempt to show such differences, and within the limits of this reply I can only make a general statement on the subject. Unirrigated land, usually manured and well advantaged by vicinity to a village site in the submontane districts of the Punjab, would rarely sell for less than Rs. 50 an acre; and not unfrequently reaches nearly double that value. Irrigated land is commonly sold for twice the price of unirrigated land of similar quality. And if the irrigated land is well manured, and such as usually bears the richer crops (sugar-cane, turmeric, tobacco, and vegetables, and such like), Rs. 200 per acre is not an unusual price. If the returns had been in such detail as to enable us to distinguish between irrigated and unirrigated land, it would have been very apparent how steadily the price of unirrigated land varies directly according to the rainfall and irrigation. This the returns indicate even as they stand; for example, the following table shows the average price of land in each district; the districts being arranged in the order of their rainfall:—

District.	Rainfall of head-quarters.	Per cent. of Cultivation irrigated.	Average price of Land per acre, 1874–75 to 1876–77.
Kángra - - - -	125·6	27	30
Simla - - - -	65·1	6	70
Hazára - - -	46·3	10	14
Siálkot - - - -	39·0	50	36
Umballa - - -	35·3	18	34
Hoshiárpur - - -	33·7	3	62
Rawalpindi - - -	31·5	2	33
Gurdáspur - - - -	30·9	16	33
Karnál - - -	30·4	39	17
Jullundur - - - -	29·8	33	76
Gujrat - - -	29·2	13	20
Gurgaon - - - -	28·5	19	21
Gujránwála - - -	26·3	70	8
Delhi - - - -	25·5	37	44
Ludhiána - - -	25·3	17	54
Amritsar - - - -	23·1	39	48
Kohát - - -	20·2	38	52
Ferozepore - - - -	20·0	14	14
Rohtak - - -	19·2	13	18
Jhelum - - - -	18·6	3	20
Lahore - - -	18·5	37	17
Hissar - - - -	16·9	5	5¼
Sirsa - - - -	14·3	3	3
Shahpur - - - -	13·0	64	14
Peshâwar - - -	12·9	25	11
Bannu - - -	12·0	15	17
Jhang - -	10·3	69	16
Montgomery - -	8·7	62	4
Dera Ismail Khan - -	8·0	32	2
Dera Ghâzi Khan - - -	7·2	57	14
Mooltan - - -	6·1	79	22
Muzaffargarh - - -	6·1	65	14

The sale of land for arrears of revenue in the Punjab is, and has been for many years past, unknown. Its sale to satisfy decrees of court is extremely rare.

On the latter point, the rule in the Punjab, a rule which originated with the old non-regulation law, and was continued under the discretionary power vested in the Government by section 327 of the present Civil Procedure Code (as well as by the corresponding provisions of the Code of 1859, which it superseded), has always been* that "no land or interest in land "shall be sold without the previous sanction of the "Commissioner of the division (Civil and Sessions "Judge), and in the case of hereditary or joint-"acquired property in land without the previous "sanction of the Chief Court." Such sanction is not given as a matter of course, but only on a consideration of the conduct of both parties, and of the whole circumstances of the decree which it is desired to enforce by this extreme process.

The Registrar of the Chief Court is unable to furnish statistics of land thus sold each year; but it is known to be of insignificant extent.

The statistics available show only the total sales of immoveable property of all kinds, and these average 1,724 per annum for the three years ending 1876. Nearly all of these are cases of sale of houses and building sites in villages and towns. Of 1,661 such cases which occurred in 1876, in only 169 was ancestral or jointly acquired property sold. The returns for the same years show that the number of cases in which temporary alienations of land† were sanctioned by civil courts for the satisfaction of decrees averaged 502 per annum.

On this point no statistics are available. It may be replied generally that transfers to non-resident landlords rarely occur; that is to say, the purchasers of land, whether agriculturists or capitalists, are almost invariably residents of the village in which the purchased land lies, or of its immediate vicinity. The total amount of land transferred to non-agriculturists since annexation could not be stated, except after inquiries in each district, the expedience of which would be more than doubtful. The annual returns of sales and mortgages (summarised in the statements appended) have, since 1874, distinguished the transfers to agriculturists from those to non-agriculturists; and it seems better to be content with the statistics thus available than to institute extensive inquiries concerning the transactions of years previous to 1874. The statements appended show that, in the three years ending 1876-77, the proportions of transfers in which the transferrees were respectively, agriculturists and non-agriculturists stood as follows :—

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* Estimated, not on the acreage, but on the land revenue demand, which is a truer valuation for such a calculation as this than the acreage would be.

† Paras. 201 and 298 respectively.

* Punjab Government notification, No. 3,859, dated 3rd October 1877. Previous thereto the prohibition extended to all immoveable property, *i.e.*, to houses as well as land. But the terms of section 327 of the present Code limit this prohibitory action to land and interests therein.

† Sections 305 and 326 Civil Procedure Code.

		No. of transactions.	Acres transferred.	Total consideration paid.
Voluntary sales under pressure of debt	To agriculturists - -	10,996	127,320	26,25,106
	To non-agriculturists -	6,563	80,186	17,87,611
Other sales - -	To agriculturists - -	2,113	36,586	4,23,873
	To non-agriculturists -	826	26,256	2,68,018
Total sales - -	To agriculturists - -	13,109	163,906	30,48,979
	To non-agriculturists -	7,389	106,442	20,55,629
	Total -	20,498	270,384	51,04,608
Mortgages for debt -	To agriculturists - -	26,082	214,165	39,85,802
	To non-agriculturists -	25,085	343,318	51,07,996
Mortgages for improvements - -	To agriculturists - -	1,479	15,005	2,09,281
	To non-agriculturists -	947	20,393	2,17,245
Total mortgages -	To agriculturists - -	27,561	229,170	41,95,083
	To non-agriculturists -	26,032	363,711	53,25,241
	Total -	53,593	592,881	95,20,324

Some remarks on the subject will be found in the appended extracts from Revenue Reports. It probably not unfrequently happens that a transferree whose main livelihood is derived from money-lending or petty agricultural banking, the class of man locally described as the banea or village trader, gets himself returned as an agriculturist on the strength of a previously acquired ownership of some other land. But even after allowing for this source of error, it is evident that of 51 lakhs of rupees expended on the purchase of lands in these three years, at least half were spent by agriculturists, and of 95 lakhs laid out in land mortgages a third were supplied by the same class. Though such facts may not by themselves establish the existence of prosperity among the agricultural class at large, they at least prove that the British administration in the Punjab has succeeded very generally in so adjusting its revenue demand on the soil as to leave to the agriculturist substantial profits; profits for the possession of which both the old agriculturists and those other classes who for generations before our rule thought only of trade and money-lending are actively competing. And, be it remembered, that this is taking place in a country where within the last 30 years agriculture was followed rather as a calling, to which certain castes and classes were then born, than as a profitable occupation; and where a land revenue pitched so high as to make its payment a burden and to absorb all the profits of agriculture had been the normal feature of previous centuries of native rule.

At the same time, lest it should be thought that the above review of the subject is one-sided, I append two papers which give a fair summary of the conflict of opinions on the subject which lately occurred in the Punjab; the one, dated 1st April 1874, by Mr. Justice Melvill; the other the proceedings of the Honourable the Lieutenant-Governor of the Punjab (Sir Henry Davies), No. 4609, dated 23rd December 1874. And it may be fairly argued that the question is not to be decided by per-centages and averages reckoned for a whole province. We here and there find tribes and tracts where the indebtedness and mortgaging is undoubtedly of a very serious character. Some tribes, as the Saiads and the Muhammadan cultivators in the east of the province, seem to be invariably thriftless and slothful, others have been accustomed for centuries to spend their energies in *quasi*-military service and in local rivalries and feuds; the field for all, which, except the first in a very limited degree, our peaceful rule has swept away, and such men are ill adapted by traditional habits for steady agricultural industry, a quality which their forefathers regarded as the mark of men much beneath them in social status.

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EXTRACT from SELECTIONS from the RECORDS of the PUNJAB GOVERNMENT (No. XIII. of 1876), being papers regarding the ALIENATION of ESTATES of INSOLVENT PROPRIETORS to the Money-lending Class.

Alienation of Estates of Insolvent Proprietors to the Money-lending Class.

Proceedings of the Honourable the Lieutenant-Governor of the Punjab in the Home Department, No. 4609, dated 23rd December 1874.

Read the following papers :—

From Registrar, Chief Court, No. 1593, dated 28th June 1872, forwarding Minute by Mr. Justice Melvill.

From Secretary to Government, Punjab, to Registrar, Chief Court, No. 2271, dated 28th June 1872.

Circular of the Chief Court No. 3 of 1873.

From Registrar, Chief Court, No. 690 dated 6th April 1874, forwarding opinions of Mr. Justice Boulnois, Mr. Justice Lindsay, and Mr. Justice Melvill.

From Registrar, Chief Court, No. 1643, dated 2nd July 1874, forwarding Notes by Mr. Justice Boulnois and Mr. Justice Thornton.

Annual Report of the Revenue Administration of the Punjab for 1873-74, paragraphs 149 to 150 inclusive.

Remarks.—The question discussed in the above correspondence is one which has of late attracted considerable public attention, not only in the Punjab, but in other parts of India, and may be briefly stated as follows :—

Is further legislative action required to protect the peasant population from the usurer and save their lands from alienation by sale or mortgage to the money-lending class?

2. So far as the Punjab Government is concerned, the subject is not a new one. The impolicy of leaving the peasantry to the mercy of the usurer, and of permitting too rapid or wholesale dispossession from their hereditary lands of old proprietary tribes, has from the first been recognised, and has largely influenced both its revenue and judicial administration.

3. With regard to revenue administration, light assessments and prompt remission or suspension of demand in unfavourable seasons have been freely granted and it is satisfactory to observe that the indebtedness of the agriculturist, which is said to call for legislative interference, is attributed, not to the undue pressure of the land revenue, but to the extravagance resulting from high credit and the increasing value of land.

4. In the Judicial Department a wide discretion has long been exercised by the civil courts in reducing extortionate claims for interest by money-lenders against agriculturists, and attention has been of late specially called to the subject by the learned Judges of the Chief Court in a circular which will be found amongst the annexures of these proceedings; and under instructions issued by them agricultural implements, including plough-bullocks, gear of wells, houses, and sheds, are exempted from attachment in execution of decrees for debt.

Again, under section 244 of Act VIII. of 1859, temporary alienation of revenue-paying land may be substituted by order of court for sale of such land in execution of decrees for debt under the provisoes with which that Act was extended to the Punjab; no ancestral or joint-acquired property in land can be sold in execution save with the sanction of the Chief Court, which is rarely accorded; and under the law

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of pre-emption, contained in sections 9 to 14 of the Punjab Laws Act of 1872, every voluntary sale of land within a village boundary is voidable, unless it is first offered to the co-sharers of the village, and, in the event of their declining, to the other members of the village community. It is further to be noted that under the general law of India all written instruments of transfer of immovable property of more than Rs. 100 in value are invalid unless publicly registered; that in regard to mortgages no foreclosure can take place except under orders of court, and in these cases also, in the case of the Punjab, the law of pre-emption applies; and lastly, that the wide definition of "undue influence" contained in section 16 of the Indian Contract Act of 1872 gives the courts the most ample power to prevent the enforcement of agreements which are not absolutely voluntary.

5. It is now to be considered whether any additional safeguards and restrictions are required to protect the agriculturist from ruin.

The necessity for further legislative action was first advocated by Mr. Justice Melvill in 1872, and on his suggestion inquiries were instituted by the Chief Court, with the sanction of the Lieutenant-Governor, in every district in the province; subsequently, in his review of the land revenue administration of 1872–73, the Lieutenant-Governor drew the attention of the Financial Commissioner to the subject, and that officer made it the subject of special inquiry during the past official year. The result of the inquiries thus independently conducted is contained in the correspondence above referred to, copy of which is appended to these proceedings; and it will be perceived that the conclusions arrived at by the superior officers of the province are widely different.

6. Mr. Justice Melvill, to whom the Lieutenant-Governor is much indebted for the attention he has devoted to this important subject, retains the opinion that, notwithstanding the restrictive laws in force, there are still grounds for believing that, owing to the usurious rates of interest charged by the money-lending class, the agriculturists are becoming deeply involved, and are being driven by pressure of creditors to transfer their lands by sale or usufructuary mortgage into the hands of strangers. He considers, therefore, that legislative action is called for, and recommends—

(1.) That courts should be enjoined to "look " behind the terms of a bond so as to unravel the " real nature of the transaction and ascertain the " principal amount with a view to the adjudication " of such a sum by way of interest as might seem " equitable in cases where, owing to the absence of " free consent, the elements of a perfectly enforce- " able contract were wanting;"

(2.) That the term of limitation for claims on account should be extended from 3 to 6 years;

(3.) That further restrictions should be placed on the voluntary sale or mortgage of lands by providing—

  (*a*.) That no transfer of land shall be permitted in payment of debt to a creditor; and,

  (*b*.) That no mortgage shall be valid for more than the lifetime of the mortgagor without the sanction of official authority;

(4.) That so much of the produce of land as represents the cost of cultivation should be exempted from attachment; and

(5.) Lastly, that imprisonment for debt should be abolished.

7. Mr. Justice Boulnois expresses inability to write at length on the very difficult and important questions raised, but gives an opinion in favour of an extension of the law of limitation and the prohibition of sales of land in execution of decrees held by mahájans for debts, and also of the abolition of imprisonment for debt.

8. Mr. Justice Lindsay, on the other hand, altogether doubts the necessity for legislative action, and Mr. Egerton, the Financial Commissioner, after reviewing the statistics of transfers of land for the past five years, is of opinion that there is nothing alarming in the extent to which land is being transferred, but that, on the contrary, a natural and healthy process is going on, which should on no account be interfered with.

9. Such being the conflict of opinion amongst the superior officers of the province as to the necessity for legislation, it appears desirable, before discussing the suitability of all or any of the measures proposed by Mr. Justice Melvill, to scrutinise carefully the grounds on which their necessity is asserted, to consider whether the extent of the evil is really such as to call for legislative interference,—in other words, whether there is any sufficient evidence that the agriculturists are to an alarming extent indebted to the money-lender, or that the transfer of lands is being affected to a serious extent to the money-lending class.

10. From a reference to Mr. Justice Melvill's final minute, and the voluminous reports upon the subject which have been obtained from the office of the Chief Court, it would appear that those who believe this to be the case found their opinions not so much upon a comprehensive survey of facts as upon their own experience and impressions, or the opinions and impressions of others. Such opinions and impressions are indeed most valuable, but it is to be remembered that they proceed for the most part from judicial officers engaged perhaps day after day in presiding as judges of civil courts in rural tracts where suits against agriculturists form, as might be expected, the staple of litigation; it is easy to understand that officers so occupied should take a gloomy view of the financial position of the peasantry: but opinions thus formed, being necessarily the result of limited observation, cannot be accepted as conclusive. Moreover, even judicial officers are by no means unanimous on the subject. The difference of opinion among the learned Judges of the Chief Court has already been adverted to; but, besides Mr. Justice Lindsay, Lieutenant-Colonel McMahon, the able Commissioner of the Hissar division, Mr. Gore Ouseley, the Commissioner of Umballa, whose long and varied experience in this and other provinces gives great weight to his opinion, the late Mr. Blyth, whose acquaintance with the feelings and wants of the people was perhaps unsurpassed, have recorded their opinions that no case is made out for further legislative interference. This view appears further to be in accordance with popular opinion, so far as that opinion has been ascertained; for it is stated that Lieutenant-Colonel Mercer, the Deputy Commissioner of the Jullundur district (one of the districts especially mentioned by Mr. Justice Melvill as requiring relief) convened a public meeting comprising representatives of all the classes most interested in the question, namely, Zamíndárs who were in debt, and had transferred their lands to meet the demands of their creditors, Zamíndárs who were free from obligation, and money-lenders who held the lands of their constituents by right of sale or mortgage, and money-lenders who had no such interest in the land. The question having been put whether any alteration in the present law was desirable, it was found to be the unanimous opinion that no further restriction should be placed upon the sale or transfer of land than that which would prevent fraud or undue advantage being taken; that any legal prohibition against usurious rates of interest would affect both lender and borrower injuriously, and diminish the market value of land, and that no alteration in the law of limitation was called for.

11. The Lieutenant-Governor's sympathies are entirely with those who would use all reasonable means to protect the agriculturist from extortion, and he is not disposed to attach too much weight to the opinions expressed adverse to legislative interference.

Nevertheless, it appears to his Honour that, before a sound judgment can be formed upon this important question, a far wider survey of the facts is necessary

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than that which has been taken by the advocates of special legislation.

Too sweeping conclusions must not be drawn from individual cases; the number of the indebted must be viewed in relation to the number that are prosperous, and the amount of land transferred with reference to the amount transferable. His Honour will endeavour to view the matter from this stand-point.

12. Looking, then, in the first place at the statistics of civil justice, it appears that while the total number of agriculturists in the province is upwards of 10,000,000, the total number of suits for debt brought against this class does not exceed 80,000 in the year, so that in one year one agriculturist out of 125 is annually sued for debt; but a reference to the Blue-Book of Judicial Statistics annually laid before Parliament will show that in England and Wales about one person in 22 is annually sued for debt in the county courts alone, and this notwithstanding the fact that the period of limitation for suits on account is twice as long as in this province.

So far, then, as freedom from debt suits is a test of solvency, the agriculturists of the Punjab must be considered far better off than the inhabitants of England.

13. But again—Is there any valid ground for supposing that the agriculturist is being driven by pressure of debt to transfer his lands to others to any serious extent?

The Financial Commissioner has during the year furnished statistics which afford an answer to this question. From these statistics it appears that during the last five years—

(1.) Sales of land for debt in execution of decrees of court were almost unknown; only one sale of ancestral land was sanctioned in 1873;

(2.) That the number of voluntary sales of land averaged less than 6,000 per annum, so that, as the proprietors of land, according to the Financial Commissioner's returns, number 2,006,670, only one proprietor out of 334 parts with land in the year;

(3.) That the number of mortgages averages less than 15,000 in the year, being at the rate of one mortgage to 133 proprietors.

(4.) That the aggregate area of assessed land annually transferred by private sale amounted on an average to less than one acre per square mile; that during the past year there were only six districts in which more than one acre per square mile was transferred, and in only a single district more than two acres per square mile;

(5.) That, on an average, not more than two acres per square mile were annually mortgaged, that last year in only seven districts did the number of acres exceed three per square mile, and of these districts five are among the most prosperous and wealthy in the province;

(6.) That the value of land is steadily rising in the market, and last year averaged 28½ years' purchase of the Government assessment.

14. Assuming, then as the most unfavourable view of the case possible, that all these transfers of land are made to money-lenders, and in consequence of pressure of debt, it will be seen that the number and extent of such transfers are insignificant, and the only fair deduction to be made from the statistics is that the proportion of extravagance which prosperity and credit naturally produce is, in the Punjab, most creditably small.

But in point of fact there appears no valid reason for supposing that *all* these transfers, whether by sale or usufructuary mortgage, are made to the money-lending class, or are in consequence of pressure of debts. Some of the sales are doubtless the result of the high prices offered, and many of the mortgages for the purpose of raising capital for agricultural improvements, while the law of pre-emption places a most effective check on the acquirement of village lands by other than members of the proprietary body; and it is shown by statistics collected in one district of the province that the bulk of the transfers of landed property are made, *not* to village bankers, but to brother agriculturists. So far then as statistics are concerned, it would appear that the apprehensions which have led to a call for legislative interference are at present without adequate foundation.

15. But his Honour does not base his opinion on statistics alone; in the course of his annual tours he has visited every district of the province, and the result of his inquiries corroborates the above conclusion; he has found that, though there may be individual cases of embarrassment due in most cases to personal extravagance, the state of the peasantry is in general eminently prosperous; and he concurs with the Financial Commissioner (who is also well acquainted with every part of the Punjab) in the opinion that the transfers which are taking place do not exceed, or indeed nearly equal, the number which may safely accompany the natural and healthy development of wealth in a country in backward circumstances.

16. There is, the Lieutenant-Governor thinks, great reason to fear that to increase the restrictions on the sale or transfer of land in the manner proposed, or to further interfere with the freedom of contract between the money-lender and the agriculturist, would operate simply to depreciate the value of land as a security, and raise still higher the rate of interest, and, while the measure would fail to teach prudence to the improvident, it would tend to destroy the habit of self-reliance and industry which characterises many of the cultivating races of the Punjab, and is one great cause of its agricultural prosperity. Finally, to extend the period of limitation in debt suits would, his Honour apprehends, only stave off and ultimately intensify the evil it is sought to remedy.

17. Fully sensible of the dangers attending the indiscriminate application of the received doctrines of political economy to unforeseen circumstances, his Honour is, as were his predecessors, prepared to sacrifice, if necessary, a large amount of theory to secure contentment among the people; but it is a matter of congratulation that in the present state of the province no such exceptional action is called for. All that appears necessary is that the civil courts should bear carefully in mind the instructions contained in the Chief Court's Circular, No. 3 of 1873, on the subject of awarding interest. Should cases of individual embarrassment largely increase in any district, it may be perhaps necessary to extend the provisions of the insolvency sections of the Punjab Laws Act to the locality, or to recommend the extension to this province of section 154 of the Land Revenue Act of the North-Western Provinces, enabling the district officer to assume the management of the lands of a disqualified proprietor; but even these measures appear hardly called for under present circumstances. Meanwhile, the subject will continue to receive his Honour's careful attention, and endeavour will be made to obtain more complete statistics on the subject.

18. One other subject touched upon in this correspondence requires notice,—the proposal to abolish imprisonment for debt. This subject is one which must be considered from a wider point of view than its effects upon the peasantry, in whose case, as pointed out by Mr. Justice Melvill, it is rarely resorted to.

But, looking at the statistics of civil justice, it appears that in the year 1873, though the number of applications for execution disposed of was 110,384, in only 6,107 cases were judgment-debtors arrested; that out of these it was only found necessary to detain 708, and that of those detained the great majority were released before the expiration of three months. It is further to be observed that any judgment-debtor who satisfies the court that he has no assets, and has not committed fraud, is at once released, and that information as to the law on the subject is hung up in every civil debtor's ward. Now, having regard to

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the fact that the sale of land in execution of decrees is, in the Punjab, practically prohibited, that execution against other property is constantly evaded by concealment of assets or vexatious claims to property attached, and, lastly, the fact that the existing rate of interest charged is said to be exorbitantly high, his Honour is doubtful of the expediency of reducing the security of a creditor still further, and raising his rate of interest by depriving him of a means of compulsion which is found to be eminently effective, is not shown to be abused, and is so fenced with precautions as to be almost incapable of being made an engine of oppression.

Mr. Melvill.

Minute by Mr. Justice P. S. MELVILL, Officiating Judge, Chief Court, Punjab,—dated Lahore, 1st April 1874.

Replies having now been received to the questions suggested in my memorandum of the 11th June 1872, the substance of those replies is here noted :—

1st question.—" Whether the existing law in regard " to interest causes undue hardship to debtors; and if " so, to debtors of what class ? "

The almost unanimous reply is in the affirmative, and the class indicated is the agricultural class.

The general reasons assigned for the affirmative reply are the necessities of the revenue-paying classes, their extravagance and ignorance, and helplessness when once they have fallen into the hands of the money-lenders.

To the *2nd question,—viz.*, " Whether, owing to " decrees for excessive interest, revenue-paying land has " been sold by order of court in execution during the " last five years,"—the answer is generally in the negative. There are a few instances in which land is said to have been sold in the manner and for the cause indicated in the question; but these instances are so rare, and the amount of land sold is so small, that they do not affect the general conclusion.

The *3rd and 4th questions* are—" The extent to " which private alienations of revenue-paying land " have been made during the past five years in satis- " faction of the debts other than decrees of court," and " whether such private alienations are attributable to " the apprehended action of the courts in decreeing " excessive interest."

The answers to these questions are very indefinite. For some districts the number of cases of transfer is given without specification of the area, and for some districts the return has been given only instead of five; so that it is impossible to specify the extent to which alienations have been made. The present inquiry has not, therefore, resulted in the obtaining of reliable statistics. The causes of the alienations are not stated with any degree of certainty, but most of the replies point to the action of our courts in decreeing excessive interest, and to the heavy costs involved in suits. It is clear, however, that very extensive alienations have occurred in different parts of the Punjab during the five years preceding 1872, and that they are chiefly owing to indebtedness and the extreme difficulty of escaping from it by any other method. Some of the most prominent instances are here noted :—

District.	Alienations during last 5 years.	Cause assigned by Local Officers.
Ferozepore -	About $\frac{1}{12}$th part of the revenue-paying land.	Not the apprehended action of the courts, the alienations being made out of court after decree.
Gurdàspur -	Sales 464 cases; mortgages 2,612 cases.	Heavy expenses of law suits.
Jhang - -	37,565 acres - -	Pressure of debts and action of courts.
Peshàwar -	12,000 acres - -	Interest and costs.
Mooltan -	74,697 acres - -	Action of courts in decreeing excessive interest.
Jhelum - -	2,104 cases - -	To avoid annoyance, expense, and indignity of suits.
Kàngra -	6,553 acres sold; 34,251 acres mortgaged.	Action of the courts in decreeing excessive interest.
Rawalpindi -	27,485 acres - -	Do. Do.
Jullundur -	46,850 acres sold; 31,895 acres mortgaged.	Not the apprehended action of the courts.
Gujránwàla -	20,788 ghumáos sold; 24,760 ghumáos mortgaged.	Interest low. (The ghumáo may be roundly stated as being equivalent to an acre).
Hoshiàrpur -	6,909 acres sold; 85,290 acres mortgaged.	About 12 per cent., the total málguzár (revenue-paying) area of the district. Not the apprehended action of the courts.

The *5th question* is—" What was the custom during " Sikh rule in regard to interest ? "

No general custom applicable to all parts of the Punjab is shown to have existed, but the replies show that a very common custom in most parts of the country was that not more than 50 per cent. on the principal in cash loans, and 100 per cent. in loans of produce, was demandable by way of interest.

The *6th question* is—" Whether any, and what, alteration is desirable in the present law of interest ? "

A large majority of officers recommend an alteration in the present law, their opinions generally tending to the fixation of a maximum rate of interest that may be decreed by courts, more particularly in cases where the debtors are agriculturists, and to giving the courts the power of making an equitable adjudication of interest, notwithstanding any agreement made by the parties. Some of the most thoughtful reports, however, are against any alteration in the existing law.

2. These reports and statistics of civil litigation prove that the agricultural population of the greater part of the Punjab is very extensively indebted to the money-lenders. The class of money-lenders has increased largely during British rule; and, in addition to the petty banker, who borrows his capital from the old-established bankers, we have the landowners not uncommonly taking the lending money on the same terms and with the like avidity as the professional lender.

3. The cause of this indebtedness is to be found—1stly, in the extravagance of the borrowers; 2ndly, in the rapacity and unscrupulousness of the lenders, more especially those whose profession it is to lend.

The extravagance of the agriculturists is evinced in marriage and other social rites, and in a comparatively reckless way of living. They found themselves a few years after the introduction of British rule in the possession of landed property, which heretofore had been of no appreciable market value, but which now enabled them to raise money at pleasure, and they have too commonly used their new-born credit without reflection, borrowing more money than was fairly needed for the occasion, and squandering the excess in superfluities of living. That the prudent revenue-payer is compelled occasionally to resort to a loan is undeniable. A bad season, death of cattle, or a marriage in the family necessitate the contraction of a loan to enable him to pay the Government demand, to plough his land, or to perform a domestic duty which may not be postponed; but there has been a common disregard of caution in incurring these necessary loans, and there has been also a want of care in devoting the profits in good years to the redemption of debts.

4. The efforts of the money-lenders as a class are now commonly turned to involving the landowner in such a burden of debt that its liquidation is only possible by the transfer of his land to themselves. They are, as a general rule, rapacious and unscrupulous; the sum lent is reduced by preliminary reductions, payments by the debtor are either not credited at all or are credited at less than their value, and exorbitant interest is rapidly piled on interest. The dealings of the money-lending class in the more populous parts of the Punjab may not inappropriately be designated as a system of open plunder; the lenders and the borrowers do not stand on an equal footing; and, as a rule, there is an absence of that free consent on the part of the borrower which is

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needed to constitute a valid contract. The money-lender has superior intelligence, and he takes an unconscionable advantage of the necessity, ignorance, and carelessness of the borrowing agriculturists. It must be recollected that in the Punjab the mass of the agricultural population is composed of small peasant proprietors, and that there are but few large landed proprietors.

In these remarks I am alluding chiefly to the peasant proprietors.

5. On the other hand, it cannot be denied that the Punjab agriculturist is shrewd, and that he has now learnt to deny even just claims, and to invent all kinds of false pleas when brought into court for a debt.

6. A very general opinion is expressed by the officers who have written on this subject, that the main remedy for the existing state of things is to be found in the better education of the agricultural class. I confess that I have but little faith in this. The agriculturist ceases to follow the plough when he has undergone anything but the most rudimentary learning. In fact, he becomes physically incapacitated from doing so if subject to tuition for any length of time. The daily attendance in a room for many hours incapacitates him from enduring the heat of the sun and the hard labour necessary for farming operation, and the hand inured only to the pen becomes unfitted for the plough. It is a well-known fact that the village boy who has undergone a course of Persian, geography, and arithmetic disdains the furrow, and leaves his land to the care of a tenant. I believe that it is not desirable to teach the labouring agriculturists of the Punjab anything beyond simple writing and reading. Could even this amount of education be imparted to the rising generation, a great step would have been gained in putting the agriculturist in a position to hold his own against the banker; but unless attendance at the school up to a certain age is made by law compulsory, it is much to be doubted whether the people will send their sons for instruction. Compulsory education involves a great deal of interference by subordinate Government officials, and the preparation of registers of births, deaths, and marriages, and it would probably not be expedient to introduce such a measure at present.

There will occasionally be found men who desire to raise themselves above the herd, and every facility should be given to them to obtain a superior education; and this can be obtained by resorting to the higher-class schools. But for the agricultural population generally I do not think that the education provided by the Government can be too elementary. If the existing state of agricultural indebtedness calls for a remedy, it must rather be looked for in a measure which shall restrict the credit of the landholders rather than in any rapid improvement of their education.

7. There are still large numbers of the agriculturists who have not become indebted, but it is to be apprehended that these numbers will year by year diminish. There is a strong spirit of emulation abroad in regard to expenditure on social matters; the style of living of all classes is improving; and a general tendency is shown on the part of the agriculturists to be drawn into the vortex of extravagance.

8. The Government is the superior landlord, and, as the recipient of a share of the rent of the land, is directly interested in the welfare of those who are the recorded owners of the proprietary right in land. The Government can hardly be regarded as acting wisely in standing by with folded arms while these people are undergoing a gradual, but no less certain, process of extinction. Although there are no complete or reliable statistics to show how far the ancient landowner has been evicted by the sáhukár, I am convinced from my own experience that very extensive transfers of this kind have already taken place, and are now daily taking place, in some of the richest districts in the Punjab, the most prominent instances of which are the Hoshiárpur and Jullundur districts. It may be said that the capitalist whose hereditary occupation is that of banking will lay out money on the improvement of the land, and in some cases this may be true; but hitherto his aim has too generally been to squeeze as much out of the tillers of the ground as he can, and he does not spend money on the land. His first step is commonly to oust the proprietor from the cultivation. Whether he obtained the land by sale or mortgage, the condition of the transfer is that he shall be put in possession of the cultivating as well as of the proprietary right, or, if his condition of the transfer of the right of cultivation has not been expressly provided, and the courts in consequence refuse to put him in possession of the cultivation, he will take care to see that no doubt is left on this point in future deeds to which he is a party. The result of the present condition of the two parties is, that the hereditary banker, the bannia, sáhukár, evicts the cultivating proprietor from his land, and that the latter, driven from house and home, becomes a disaffected and disloyal subject. Let but this process go on for another 50 years, and the Government may find itself face to face with a serious political danger.

9. I, therefore, submit that it is the part of Government to provide a remedy for the evil before it is too late.

10. In my memorandum of the 11th June 1872, I did not intend to suggest any alteration of the law so as to affect the transactions of borrowers and lenders out of court. The whole object of what I wrote was in relation to the action of the courts in decreeing interest. Since that time the book circular of the Chief Court, No. 3 of 1873, has been issued. This circular meets to a very great extent the evil which it was my wish to remedy, and I am of opinion that it would now be sufficient, so far as the action of the courts is concerned, were it to be further enjoined that the equitable principle laid down in the circular should be applied in going behind the terms of a bond so as to unravel the real nature of the transaction, and ascertain the principal amount with a view to the adjudication of such a sum by way of interest as might seem equitable in cases where, owing to the absence of free consent, the elements of a perfectly enforceable contract were wanting.

On a careful consideration of this subject I am not prepared to recommend any alteration in the law of interest where the rate of interest has been agreed upon by the parties concerned.

11. But there are two measures which seem to be necessary. The first is, that the law of limitation should be altered, and the second, that the credit of the owners of land in the Punjab should be restricted.

12. The history of the law of limitation in the Punjab is as follows:—

In the rules issued by the Governor-General for the administration of civil justice in the Punjab, issued in 1849, the period for the recovery of debts on bonds or accounts was 12 years; in 1856* the limit was reduced to six years; 1859† the limit of six years was retained for debt on bond below Rs. 50, and on registered bonds for and above Rs. 50, but it was reduced to three years for debt based on unregistered bonds above Rs. 50 and on accounts; in 1867 Act XIV. of 1859 was introduced, and this has been followed by Act IX. of 1871, which is now in force, and by both these laws the limits for suits on registered bonds is six years, and for suits on unregistered bonds and accounts it is three years.

13. When the change was made in 1859 from the limitation of six years to three years for debts on account or unregistered bonds, there was much apprehension created in the minds of the bankers. I recollect that this apprehension was often expressed to me, and when I have alluded to the subject of late

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* Government of India, No. 5238A., dated 24th October 1859.

† Government of India. No. 159A., dated 24th February 1859.

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years I have generally found both the banking and agricultural classes opposed to the shorter term of limitation. It may be agreed that a short period for the adjustment of account works to the advantage of the agriculturist, who is thus able to recollect and prove the transactions in which he has been engaged, and that a longer period would result in his finding himself involved in a hopeless well of difficulty; but, although there is truth in this position, it is also true that three years is frequently an insufficient term to allow of a debt being paid off. The margin of profit left to a peasant proprietor, whose holding is ordinarily small, is narrow, and, supposing that he has recourse to a loan in a time of difficulty, such as the failure of the harvest or death of cattle, it all depends on the two next years being plentiful whether he is able to pay off the loan or not. If these fail, the creditor is compelled by the law of limitation to take a fresh bond including the interest due on the first loan, and then the difficulties of the borrower become serious. Were a period of six years allowed for unregistered and of twelve years for registered loans, I believe that the difficulties of the borrower would be materially lessened. I believe that the knowledge on the part of the lender that he would have a fair time within which to realise his dues would tend to reduce the rate of interest, and that the honest borrower would be able to repay the debt, which now he often cannot do. An alteration of this kind in the law of limitation would be hailed as a great boon by both bankers and agriculturists. A very considerable reduction in the amount of litigation might be expected to result from this change.

14. The most important point, however, is to curtail the credit of the landowners, and this can only be done by placing restrictions on the voluntary transfer of the proprietary right in land. Sales of ancestral land by order of court are practically unknown, in consequence of the Chief Court refusing to sanction them, and therefore the restriction required must be placed on so-called voluntary transfer. The restriction might be that no transfer of the proprietorship of land by private sale should be permitted in payment of a debt to a creditor, whether alien or of the brotherhood, and that mortgages should only be allowed for the lifetime of the mortgagor to a creditor; that no sale or mortgage for a term beyond the life of the mortgagor to parties other than creditor should be allowed without the sanction of the deputy commissioner and commissioner; and that that sanction should not be granted if the transaction is in any way connected with the payment of a debt. By such provisions the mere money-lender would be prevented from getting land otherwise than by fair purchase in the open market; while the legitimate transfer of land by parties not indebted would be practically free.

15. The result of such a course might perhaps be a depreciation in the value of land, but probably not to any serious extent. What is wanted in the Punjab is to prevent the hereditary owners of land from being evicted by the pressure of debt, and if this end is attained a slight depreciation in the market value of land is not of much consequence.

16. The question then arises whether the agriculturists would find the money-lenders willing to advance loans for necessary purposes under these conditions. The fact is that the great body of the lenders are dependent on the agriculturists for their business, and there seems no reason to believe that they woulp hesitate to continue their dealings with them, though they would take care only to advance such amounts as there was a fair prospect of recovering. They would not lend in a reckless way, as they now do, in order to hopelessly involve the debtor with a view to eventually getting his land. They would find themselves very much in the same position as in the Sikh time. Nor do I think that the rate of interest would increase. The banking class is the most valuable section of the community, and is entitled to a fair consideration of its interests. The object in what I suggest is to prevent the unfair use of their opportunities.

17. It is a question whether the Government should not, in the event of the above suggestions being approved, set on foot a scheme for redeeming outstanding mortgages held by alien money-lenders, with a view to the reinstatement of the mortgagors in their land. As, however, the measures which I have suggested are radical, and open to many opposing considerations, and the subject is one on which great differences of opinion exist, I would recommend, in the event of the Government not being prepared to take any immediate decisive action, that statistics should be collected each year showing, as far as possible, the state of indebtedness of the agricultural population, and full details of the alienations of land.

18. It would be a good thing if imprisonment for debt were abolished. It but rarely happens that agriculturists are imprisoned on this account, but it seems advisable to remove an engine that may be used for pressing and ruining those who are engaged in husbandry.

19. It is very desirable that some change should be made in the Civil Procedure Code in regard to the attachment and sale of crops in execution of decrees for money. At present the standing crop is not unfrequently attached; a watcher is appointed at the cost of the debtor; and when the grain has been harvested the whole is sold by auction, and the proceeds, after deducting the amount due as Government revenue, are made over to the judgment-creditor. Now, it may sometimes be necessary to attach a standing crop to prevent its being suddenly reaped and made away with, but the attachment should never be made until the crop is about to ripen; and in regard to the appropriation of the yield, it would appear to be in consonance no less with equity than the spirit of the Code to provide that the creditor should only receive that portion of the net produce which remains after paying the Government revenue, or, in other words, that the creditor should get only the proprietor's profit. It would follow from this proposition that the produce of a non-proprietary cultivator could not be touched in execution of a decree for money.

To allow a judgment-creditor to appropriate the whole of the produce that remains after satisfying the Government demands is palpably unjust; for not only is the cultivator thereby deprived of the means of supporting himself and his family, but he is incapacitated from cultivating the land in future without incurring fresh liabilities.

NORTH-WESTERN PROVINCES.

NORTH-
WESTER
PROVINCE

Mr. Buc

Two statements are appended, of which the first shows the number of sales which have occurred in each district of the North-Western Provinces in the three years 1874–75 to 1876–77 inclusive. The second shows the total amount of property transferred in the whole province during four years. The amount of revenue transferred is given, but the area of land transferred is not known. Only, therefore the number of years' purchase of revenue can be given and not the price per acre. A rough calculation can

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however, be made of the latter by multiplying the average revenue rate per acre by the number of years' purchase of revenue in each district. If the revenue rate in cultivated area is Rs. 2, and the number of years' purchase is 10, then the price per cultivated care will be Rs. 20.

It will be observed that in the Meerut division and in Gorakhpur and Basti, in which parts of the North-Western Provinces the revenue is low, prices have a tendency to be higher than elsewhere when tested by the number of years' purchase of revenue. The actual price per acre does not, therefore, vary so much as the figures in columns 5 and 9 of the district statements would infer. The rate of revenue in Cawnpore, for instance, is Rs. 2-8-0 per acre, and the number of years' purchase of revenue is Rs. 8; the average price per acre is, therefore, Rs. 8 × Rs. 2-8-0 = Rs. 20. In Muzaffarnagar the rate is Rs. 2, and the number of years' purchase Rs. 20; the average price is, therefore, per acre Rs. 40. In Bulandshahr the rate is Re. 1-8-0, and the average number of years' purchase is Rs. 25; the price per acre is, therefore, Rs. 37½.

The general result is to show that the price of land ranges from between Rs. 2 and Rs. 12 per acre in the Jahánsi division and Bundelkhand, to a maximum of Rs. 51 in the Basti district and Rs. 54 in Dehra. In the permanently settled districts prices vary from 10*s.* to 25*s.* per acre; in the Lower Doab from 18*s.* to 20*s.*; in the Middle Doab from 15*s.* to 25*s.*; in the Upper Doab from 18*s.* to 49*s.* and in Rohiland from 13*s.* to 34*s.* It is a significant fact that the value of land in the permanently settled districts, except Jaunpur, is less than in most of the temporarily settled districts.

The best answer to the question as to transfer from the agricultural to non-agricultural classes is to quote a note on the subject compiled in the Board of Revenue, in 1873, for 11 selected districts:—

NOTE on the STATEMENTS submitted in reply to the BOARD OF REVENUE CIRCULAR No. 455, dated 25th April 1873, on the transfer of landed property from Agricultural to Non-agricultural Classes.

1. The Board in April last called upon the settlement officers of the 11 districts* for returns showing the extent to which landed property had been transferred during the last settlement from the possession of the old proprietors into the hands of non-agricultural classes. A form of return was prescribed, and it was explained that the term agricultural was intended to include persons connected with land by long association,—such as talukdars, as well as those who follow agriculture as a profession. Under the head of non-agricultural would come classes holding landed property as a source of income, but not the main source of income, whose connection with the land was an accident, not a custom, such as professional money-lenders, Government servants, &c. Replies have been received from all districts except Budaun, where there is now no Settlement Officer. The reply furnished by the collector of Mainpuri, to whom the Assistant Settlement Officer on leaving the district had made over the reference, was obviously incorrect; and Mr. McConaghey, the recent Settlement Officer, has, from the records by him at Naini Tal, supplied the information in another form. The reply from Cawnpore embraces two tahsils only.

2. These statements show the extent to which land has actually been *transferred.* They do not show the extent to which it is *encumbered.* They give an index to the losses of the old agricultural proprietors during the last 30 years; but they do not give any clue to the obligations of present proprietors.

3. The result, taking the extreme periods of reference given in each case, is as follows:—

District.	Former area as given in column 4.	Former area held by Agriculturists.	Per-centage.	Present area as given in column 4.	Present area held by Agriculturists.	Per-centage.
Muzaffarnagar. -	981,458	872,081	89	999,901	793,150	80
Aligarh (4 tahsîls).	767,146	716,249	93	778,818	555,719	71
Farukhabad,	1,047,025	953,923	91	1,027,915	891,528	87
Etáwah -	546,789	495,533	96	574,025	429,410	75
Sháhjahánpur.	849,411	797,311	94	922,302	769,343	83
Bijnor -	535,328	519,342	97	452,142	390,873	86
Allahabad -	1,667,104	1,546,995	92.8	1,667,104	1,313,177	78·7
Azamgarh -	902,450	872,837	96.7	902,450	835,851	92·6
Cawnpore -	236,740	126,581	53	262,398	111,617	42
Agra (8 tahsîls).	1,008,570	806,435	79	990,435	777,508	78
Total -	8,542,021	7,707,287	90	9,377,490	6,868,176	73

According to these returns, the agricultural proprietors, in the area given here, held 18 per cent. less than at the commencement of last settlement. Non-agricultural proprietors, instead of 10 per cent., now hold 27 per cent. of the revenue-paying area. The figures, as above stated, do not show how much is held by conditional mortgage, or how much is hypothecated.

4. The figures, though perhaps not in all cases absolutely correct, are quite sufficiently so for the purpose of the Board. The records from which they were drawn are reliable; and such inaccuracy as there is will arise from the partial absence of records, or from haste in drawing up the statement.

5. The Settlement Officers have in many cases furnished comments on the statements. The results in each district may be briefly noted.

6. Muzaffarnagar.—In this, as in most other districts, the results furnished by different parganas vary widely. In Muzaffarnagar itself the area owned by non-agriculturists has increased from 10,268 to 18,993—from 18 to 32 per cent. In Burhanah it has decreased from 4,949, or 11·75 per cent., to 1,038, or 2 per cent. In Bugrah it has increased from 8,029, or 14·25 per cent., to 15,759, or 28 per cent. In Bhokurheree from 14,060 acres, or 18½ per cent., to 33,199, or 42·75 per cent. Mr. Cadell, who has analysed the causes of transfer in the several parganas, notices that it is the thriftless Muhammadan proprietors, and not the village communities, who have chiefly suffered. He also notes that severity of assessment has had little to do with the transfers. The characteristics of the new class of proprietors are described in paras. 28 to 29 of Mr. Cadell's note. The great mass of transfers took place from 1840 to 1860. In the decade between 1860 to 1870, during which Muzaffarnagar has been under settlement, transfers have been few, and the amount less than the average of the two preceding decades.

7. In Aligarh there have been extensive transfers. In tahsil Atrauli non-agriculturists, who in 1840 owned 8,507 acres, or 4 per cent. of the area, now own 49,187, or 22 per cent. In Hathras the area in their hands has increased from 35,134 acres, or 21 per cent., to 90,983, or 52 per cent. In Iglas they now own 27 per cent. of the tahsil against 4 per cent. at last settlement. The periods during which the transfers were effected differ in the several tahsils, and the Settlement Officer has not offered any detailed remarks. In Atrauli and Iglas they occurred principally between 1860 and 1870; in Hathras between 1840 and 1850; in Khyr (where details of one decade are wanting) between 1840 and 1860.

The Settlement Officer writes that "it may be

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* Muzaffarnagar, Aligarh, Farukhabad, Mainpuri, Etáwah, Sháhjahánpur, Budaun, Bijnor, Allahabad, Azamgarh, Cawnpore

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" assumed as tolerably certain that not less than about " 20 per cent. or one-fifth of the entire area of the " district has fallen into the hands of the non- " agricultural classes between 1840 and the present " settlement." The talukdars in this district have generally held their own, the village communities having been the chief sufferers, a state of affairs precisely the reverse of what has occurred in Muzaffarnagar. So again, while the Settlement Officer of Muzaffarnagar is of opinion that the pressure of the assessment has not affected transfers in Aligarh, it is in Hathras, "which has always had to bear an abnormally heavy assessment," that transfers have been most extensive.

8. In Farukhabad the changes have been less marked: 13 per cent. only of the district is in the hands of non-agriculturists, against 2 per cent. in 1803. It is noticeable that in the three parganas of Shamsabad East, Khakatmau, and Shamsabad West, in which transfers have been most extensive, the assessment does not seem to have been heavy. The periods into which the transfers are arranged do not admit of any comparison between the several decades. It can only be said that transfers have been less numerous since than before 1837.

9. The officiating Settlement Officer of Etawah has supplied comments on his figures, which have again been criticised by the recent Settlement Officer, Mr. Crosthwaite, who questions the conclusions drawn by Mr. Neale, and apparently with reasons. The greater part of the transfers, comparing decade with decade, occurred between 1840 and 1850, and in each successive decade they have become less extensive. One-quarter of the district, however, is now held by non-agriculturists, whereas one twenty-fifth only was so held in 1840.

10. In Sháhjahánpur transfers occurred chiefly between 1840 and 1860. In this district, compared with the average of the first two decades, the ratio of transfer has somewhat increased during the last decade. In the Tilhar tahsîl the area occupied by non-agriculturists has doubled in 30 years; in Pawayan it has quadrupled. The larger amount of transfers occurred between 1860 and 1870 in tahsîl Sháhjahanpur, and, compared with the average of the two former decades, in tahsîl Pawayan. The Assistant Settlement Officer has given a valuable note on the transfers in this district, in which he ascribes to the pressure of the assessments the chief part in the causes of transfer. He divides the parganas into those which are (1) heavily, (2) moderately, (3) lightly, assessed, and shows that the per-centage of transfer, after eliminating disturbing causes in each, has severally been 24·5, 9·4, and 6. The village communities appear to have been the class chiefly affected.

11. Bijnor does not show very extensive transfers, except in the parganas of Mandawar and Bijnor. The Settlement Officer in para. 11 explains the exceptional circumstances of the former pargana, but says nothing of the latter. Since 1860 the amount of transfers has lessened. The Settlement Officer attributes this to the increased prosperity of the proprietors, but it is probably as much due to settlement operations (which commenced here in 1864, and are still in progress), it being a well-known rule that during the progress of a settlement transfers are generally suspended, parties holding a lien on the land preferring to wait until the amount of the new assessment is declared. The chief losers have been the Jats (who are the back-bone of the agricultural population) and the Syuds, who have strong social influence, but are not otherwise of importance. The chief gainers have been money-lenders.

12. In Allahabad, transfers have been extensive in Karrah, Sikandra, Arail, and Muh only; the two latter fully assessed, the two former more or less lightly. Transfers occurred chiefly between 1850 and 1860, and have in the last decade fallen off. The Settlement Officer attributes this to the increasing prosperity of proprietors under a light assessment; but if this is the case, it is not clear why in Nawabganj, Soraon, and Kurari, parganas exceptionally lightly assessed, the amount transferred during the last decade should so largely exceed the transfers in any previous decade. If, as prosperity increased, transfers became fewer, *à fortiori* in parganas always prosperous transfers towards the close of a settlement should scarcely occur at all.

13. In Azamgarh, excepting in Nizamabad, transfers have been few.

14. In Agra they have been extensive in Iradatnagar only, while in seven parganas non-agriculturists would seem to have actually lost property. The chief transfers seem to have been during the first decade of the settlement; but the Settlement Officer, who has but recently joined the district, does not offer any criticisms.

15. Cawnpore calls for no special remark; and the Mainpuri return (which is exceptional in form) has been analysed by the Settlement Officer. The Rajput and Ahir village communities have been the chief sufferers—Brahmans, Marwaris, and Bannyahs being the principal purchasers.

16. The conclusion to be drawn from the figures seems to be that, though transfers may have been on a smaller scale than was supposed, they have nevertheless been considerable; that the land is beyond doubt passing into new hands; and that, at the ratio of the last 30 years, the whole of the country would be in the hands of non-agricultural classes in 150 years, if the causes which led to transfer continue to operate. But during the last 10 years (in most districts, years of settlement) the ratio of transfer has decreased; and, if we are to judge by them, the agricultural classes are growing more secure in their property. On the other hand, it is probable that obligations, now not insisted on, will be pressed as soon as the new settlements, are concluded. Again, the recent revision of settlement, which has led to a large increase of assessment, will probably lead to an increase in the rate of transfer. Against this may be set the probability that improvidence will grow less as time goes on. The village communities, it may be noted, have suffered more than the talukdars, who have themselves in many cases acquired large properties at the expense of the village communities. The pressure of existing embarrassments, combined with an enhanced demand, will, probably, rather accelerate the rate of transfer among the communities during the next 10 or 12 years.

17. Whether the new men are a source of strength to British rule, and whether it is for the benefit of the money-lending classes that proprietary rights have been conferred and long-term settlements sanctioned, it is for Government to determine. The opinions of the officers consulted differ, it will be seen, considerably, and the verdict against the new men is by no means unanimous. The rate of transfer, should extensive transfer to a new class seem open to objection, does not seem to call at present for very drastic measures; and it seems desirable rather to check than to prevent transfers, and to keep in sight the fact that the village communities are at least as much affected as the large holders, for theirs is the most difficult case to deal with, and their numbers give them great importance.

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TABLE showing NUMBER of TRANSFERS of RIGHTS in LAND PROPERTY by SALE in each DISTRICT of the NORTH-WESTERN PROVINCES for THREE YEARS, 1874–75 to 1876–77, inclusive.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
		Sales under Orders of Courts.				Private Sales.						
Division.	District.	Number of Cases.	Revenue of Property transferred.	Price.	Number of Years' Purchase of Land Revenue.	Number of Cases.	Revenue of Property transferred.	Price.	Number of Years' Purchase of Land Revenue.	Average Number of Years' Purchase of both classes.	Average Rate of Revenue on cultivated Area.	Average Price per Acre, multiplying column 10 by 11.
			Rs.	Rs.			Rs.	Rs.			Rs. A. P.	Rs.
Meerut.	Dehra -	18	524	21,951	41	139	5,150	2,38,475	46	43	1 4 0	54
	Saháranpur -	490	13,299	1,18,822	9	2,266	43,908	5,84,276	13	12	1 8 0	18
	Muzaffarnagar	265	11,593	1,28,811	11	1,253	34,781	7,96,796	23	20	2 0 0	40
	Meerut -	428	9,198	1,74,597	19	1,730	52,703	11,90,557	23	22	2 4 0	49
	Bulandshahr -	446	20,847	3,00,042	14	533	22,026	7,58,978	34	25	1 8 0	37
	Aligarh -	237	20,022	2,06,169	10	582	59,268	7,73,008	13	12	2 4 0	27
Rohilkhand.	Bijnor -	305	14,816	1,30,639	9	1,330	27,338	6,06,773	22	17	2 0 0	34
	Moradabad -	412	27,698	2,84,758	10	1,124	39,662	6,08,962	16	13	1 12 0	23
	Bareilly -	399	55,061	4,44,767	8	952	1,55,059	17,40,264	11	10	1 12 0	18
	Budaun -	530	14,498	1,80,696	12	1,332	57,934	9,08,192	16	15	1 4 0	19
	Sháhjahánpur	384	36,794	1,67,367	4	8,318	48,425	5,67,459	12	9	1 8 0	13
Agra.	Muttra -	47	1,985	12,584	6	336	7,752	1,24,375	16	13	2 0 0	26
	Agra -	347	17,183	1,35,492	8	641	30,344	4,00,099	13	11	2 4 0	25
	Mainpuri -	313	23,321	1,79,656	8	517	34,015	3,21,637	9	9	2 0 0	18
	Farukhabad -	790	31,114	2,23,576	7	765	39,379	6,16,478	16	12	2 0 0	24
	Etáwah -	132	8,919	39,170	4	324	17,890	1,89,990	11	6	2 8 0	15
	Etah -	339	25,243	1,87,753	7	531	23,270	3,93,120	17	12	1 8 0	18
Jhánsi.	Jalaun -	83	11,449	47,794	4	354	20,095	1,73,245	9	6	2 0 0	12
	Jhánsi -	40	3,145	10,329	3	121	8,829	47,096	5	5	1 4 0	6
	Lalitpur -	—	—	—	—	45	2,818	6,240	2	—	0 12 0	2
Allahabad.	Cawnpore -	149	20,117	92,915	5	480	42,019	3,91,327	9	8	2 8 0	20
	Fatehpur -	253	42,503	2,75,939	6	626	39,786	3,37,841	8	7	2 8 0	18
	Bánda -	144	26,835	52,280	2	782	54,861	2,31,872	4	3	1 12 0	5
	Allahabad -	533	69,700	4,88,138	7	886	77,276	8,40,500	11	9	2 4 0	20
	Hamírpur -	76	7,482	19,830	3	711	37,569	1,99,725	5	4	1 8 0	6
	Jaunpur -	33	12,485	1,10,456	9	645	39,591	5,18,187	13	12	2 2 0	25
Benares.	Azamgarh -	124	12,551	1,47,114	11	2,152	50,048	8,12,385	16	15	1 12 0	26
	Mirzapur -	95	18,245	68,172	4	288	27,603	4,42,696	16	11	0 14 0	10
	Benares -	76	28,424	3,37,493	12	360	66,175	3,39,102	5	7	1 13 0	13
	Gorakhpur -	629	12,256	1,50,266	12	2,979	64,678	14,62,390	23	21	1 0 0	21
	Basti -	17	894	11,742	13	2,357	20,609	10,84,231	53	51	1 0 0	51
	Gházipur -	205	33,302	4,32,129	4	2,065	50,158	9,47,265	19	13	1 4 0	16
Kumaun.	Kumaun -	108	330	10,900	33	735	2,652	1,19,480	45	43	0 12 0	32
	arh w al -	67	151	5,410	36	358	848	23,356	28	27	1 0 0	27

TABLE showing NUMBER of TRANSFERS of RIGHTS in LAND PROPERTY in the NORTH-WESTERN PROVINCES from the Year 1878–74 to 1876–77 (excluding Oudh).

Year.	Under Orders of Courts.					Private.					Number of Mortgages.
	Number of Cases.	Revenue of Property transferred.	Price.	Number of Years' Purchase of Land Revenue.	Price per Acre, Revenue per Acre being assumed as Rs. 2.	Number of Cases.	Revenue of Property transferred.	Price.	Number of Years' Purchase of Land Revenue.	Price per Acre, Revenue per Acre being assumed as Rs. 2.	
		Rs.	Rs.		Rs.		Rs.	Rs.		Rs.	
1873–74 -	2,838	2,15,482	15,06,574	7	14	8,883	4,58,293	56,35,233	12	24	7,440
1874–75 -	2,488	1,82,104	12,41,304	7	14	9,653	4,46,215	60,18,995	14	28	6,609
1875–76 -	2,708	2,00,742	14,38,602	7	14	10,255	4,71,560	61,58,462	13	26	6,758
1876–77 -	3,322	2,49,994	22,31,281	9	18	11,252	4,09,289	66,33,106	16	32	8,053
Total -	11,356	8,48,322	64,17,761	8	16	40,043	17,85,357	2,44,45,796	14	28	28,855
Average for four years	2,839	2,12,080	16,04,440	8	16	10,010	4,46,339	61,11,449	14	28	7,214

BENGAL.

Mr. Toynbee.

BENGAL.

Price of land; sales of land, &c.—The answer to this question is given, district by district, in a statement* received from the district officers in reply to a circular asking for the information.

Sales for arrears of revenue are, generally speaking, owing to the voluntary default of persons wishing to sell their estates. Purchasers pay a larger price at a sale held by the collector for arrears of revenue than they would pay at a civil court sale, under the idea that they secure a better title at the former. It may be confidently asserted that in no district in Bengal does the land revenue press heavily on the soil; on the contrary, it is less than half what it would have been had it not been for the introduction of the permanent settlement—*vide* answer to question 13. No information is available as regards the amount of land sold for decrees of court. Both in civil and revenue court sales the amount of the land, or share in land, which is to be sold is not specified. The terms of the sale are that the purchaser shall buy such right, title, or interest as the judgment-debtor may possess—whatever it be. Whole estates are very rarely sold. The majority of sales are of shares in land only, and do not even specify the extent of the share. Until the passing of the present Land Registration Act, which was introduced with a view of remedying this state of affairs, the same procedure was followed in the collector's office. The registration of a transfer was purely voluntary, and no obligation was on the transferee, if he did register it, to state his specific share or interest. The Act above referred to has not yet been fully worked out, but is now in full operation, and may be expected to be finished within a year. The returns submitted to the High Court by the subordinate civil courts do not even specify the price paid for such interests as are sold by them, and they are quite valueless for purposes of comparison.

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BENGAL.

Mr. Toynbee.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.

Average price of land.—We cannot give reliable figures. In many cases of transfer of land, perhaps in the majority of cases, there are circumstances and considerations which, without special and minute inquiry, will never come to light: for instance, old debts may be foregone, and the parties may agree to evade the stamp duty by concealing the full consideration, or in cases of auction sales, subject to lien, the bids offered in court may be only a portion of the amount which the purchaser will have to pay, or the decree-holder may have unrealisable claims against the property to be sold, so that it is the same to his pocket whether he bids 600 or 1,000 rupees for the land.

Again, land is not sold at acreage rates. But I think we may safely say that there is much capital ready to be invested in the purchase of land, provided that the land promises to pay at from 12 to 9 per cent. annual income on the investment. This will vary in different districts. In Chhattisgarh, Balaghat, Bhandara and Chanda, land will very rarely fetch such high rates. Competition for land is keenest in Wardha and the Nerbudda valley and Jubbulpore.

Amount of land sold annually for arrears of revenue and for decrees of court.—Since the settlement it has not been found necessary to sell any land for arrears of revenue in the collectorate courts. During the last three years the average amount of land sold in execution of decrees of the civil courts has been 119,396 acres, paying a revenue of Rs. 29,776.

Temporary alienations under orders of the courts have been on an average 25,991 acres, paying a jama of Rs. 9,997. We may now look for a decrease in the quantity of ancestral lands thus sold.

Amount of land transferred to agricultural and non-resident landlords.—I have no statistics or information regarding non-resident landlords. I cannot give the quantities of land nor the amount of consideration, but in respect of transfers to non-agricultural purchasers I recently showed in my registration report that (in 1877-78) there were registered 1,493 documents alienating land by sale. Proprietary rights in whole villages were sold in 207 cases, members of the trading classes acquiring these rights in 93; proprietary right in shares of villages were sold in 354 cases, and the trading classes acquired such rights in 109. Sub-proprietary rights in whole villages were sold in 16 cases, and in four the trading classes acquired these rights; in shares of villages there were 25 exchanges, three of which fell to traders. Minor rights in land were sold in 2,797 cases, traders and bankers purchasing such rights in 746.

The following are the statistics for the two preceding years:—

	1875-76.	1876-77.
Total number of documents alienating land by sale - - -	2,998	4,075
Proprietary rights in whole villages sold to bankers and traders - - - -	89	110
Ditto to others than the above - -	130	110
Proprietary rights in shares of villages sold to traders and bankers - - -	115	116
Ditto to others than the above -	297	236
Sub-proprietary rights in villages sold to bankers and traders -	3	18
Ditto to others than the above -	6	4
Sub-proprietary rights in shares of villages sold to bankers and traders - - - -	4	17
Ditto sold to others than the above	8	7
Other minor rights sold to bankers and traders - - -	655	913
Ditto to others than the above -	1,691	1,972

BERAR.

BERAR.

Mr. Dunlop.

Average Price of Land.

STATEMENT showing a few instances taken at random of Land being sold, and the prices realised during the year 1876-77 in the Ellichpur District:—

Area in acres and guntas.		Rental.			Amount for which sold.			Number of years' Purchase of Rental.
		Rs.	a.	p.	Rs.	a.	p.	
6	28	12	0	0	200	0	0	17 years' purchase.
48	8	84	0	0	950	0	0	11 do. (nearly).
2	31	5	0	0	80	0	0	16 do.
20	23	34	0	0	500	0	0	5 do.
23	17	42	0	0	500	0	0	12 do.
15	15	29	0	0	500	0	0	17 do.

STATEMENT showing Fields in the Ellichpur taluka temporarily alienated (for a year only) for 1877-78:—

Area in acres and guntas.		Rental.			Sum paid by Purchaser for one year's Cultivation, viz., 1877-78.		
		Rs.	a.	p.	Rs.	a.	p.
42	26	98	13	0	386	13	0
19	36	44	2	0	124	2	0
59	6	126	10	0	315	11	0
7	33	28	8	0	74	8	0

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Mr. Dunlop.

The correctness of these figures is confirmed by the following statement of sales of land in the Amraoti district in the year under report, which had been bought only in the previous year, and were re-sold.

Statement showing a few instances in which Land was recently sold and re-sold at a profit under Registered deeds:—

Land sold.			The same land re-sold for	Number of years' Purchase of Assessment.
Area.	Rent.	Price sold for.		
A. g.	Rs. a. p.	Rs. a. p.	Rs. a. p.	
12 23	18 0 0	300 0 0	343 0 0	19 years' purchase.
16 18	26 0 0	100 0 0	300 0 0	11 do.
100 16	172 0 0	700 0 0	1,000 0 0	6 do. (nearly).
12 32	25 8 0	200 0 0	300 0 0	12 do.
23 0	37 0 0	375 0 0	625 0 0	17 do.
36 34	48 0 0	100 0 0	361 0 0	7½ do.
16 25	26 0 0	90 0 0	260 0 0	10 do.

It is possible that some of the sales given in the first statement may have been fictitious; but this is impossible in the temporary alienations given in the second statement, and highly improbable in the sales and re-sales enumerated in the third statement, which were all registered. For this last statement I am indebted to the courtesy of the Inspector-General of Registration.

Sales of land under decrees of court require the sanction of the commissioner in cases of self-acquired land, and of the resident in cases of ancestral land. The number of sales effected with such sanction is shown below. I am unable to give the area sold:—

Years.	Number of instances in which Land was attached under decrees of courts.	Nos. of Sales.
1873 -	752	180
1874 -	1,042	72
1875 -	754	138
1876 -	1,075	179
1877 -	1,054	79

In the majority of cases in which land was attached it was temporarily alienated for periods ranging chiefly from one to 10 years, a few alienations being for periods of more than 10 years.

We have no reliable statistics as to the transfer of lands to non-agricultural and absentee landlords, and it would be very difficult to obtain them.

Transfers are very frequently merely nominal, made with intent to defeat the decrees of civil courts. A great deal of land is mortgaged to money-lenders.

The same remarks apply with equal force to the Akola and other districts. There is no doubt, however, I think, that the money-lenders are gradually acquiring a considerable quantity of land, which they sublet to agriculturists.

Bombay.

Col. Anderson.

BOMBAY.

District.	Average price of Land per acre.	Average amount of Land sold yearly for arrears of revenue.	Average amount of Land sold for Decrees of Court.	How much land transferred to non-agricultural and not resident Landlords.
		Acres.	Acres.	Acres.
Kaira - -	Rs. 200 in rich lands, Rs. 25 in poor	225	No data - -	Said to be 10,000 acres.
Broach - -	Rs. 42-4-0 - - - - -	—	—	—
Surat - -	Rs. 88-6-4 - - - - -	771, average of 4 years. 186, average of 2 years.	185, average of 4 years. 168, average of 2 years.	—
Thana - - -	Rice land from Rs. 10 to Rs. 125, dry crop land from 8 annas to 46 rupees.	1,478	—	1,526
Colaba - -	Rice land Rs. 120, warkas land Rs. 15.	254	—	220,413
Khandesh - - -	Good land Rs. 100, bad land nominal	1875-76 there were 336 sales. 1876-77 there were 652 sales.	—	—
Nassick - -	Up to 40 years' purchase - -	1875-76 there were 100 sales. 1876-77 there were 158 sales.	—	Much land. Quantity unknown.
Poona - - -	Garden land near Poona Rs. 200 to 300, dry crop land Rs. 10 to 25.	1875-76 there were 333 sales. 1876-77 there were 117 sales.	—	—
Sholapur - -	—	1875-76 there were 104 sales. 1876-77 there were 18 sales.	—	—
Ahmednagar - -	—	1875-76 there were 79 sales. 1876-77 there were 10 sales.	—	—
Kaladgi - -	Good land 15 years' assessment, inferior 5 years' assessment.	349⅓	—	Most of the sahukars hold some land; quantity unknown.
Dharwar - - -	Varies greatly - - -	—	—	25 per cent. of the land.

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District.	Average price of land per acre.	Average amount of land sold yearly for arrears of revenue.	Average amount of land sold for decrees of court.	How much land transferred to non-agricultural and not resident landlords.
		Acres.	Acres.	Acres.
Canara - -	Good garden land Rs. 700–800 per acre, poor high land Rs. 20–50.	About 100 acres yearly.	—	—
Ratnagiri - -	Rice land Rs. 100 per acre, but it rises to Rs. 400 to 500 near large towns on the coast. Warkas Rs. 15 to 50 per acre, according to soil and position.	—	—	No land has been transferred to non-resident non-agricultural landlords.
Sattara - -	15 times the assessment - -	About 500 acres. Sales in 1875–76, 39; in 1876–77; 19.	About 1,000 acres.	About 1,300 acres.

The information in this table is most imperfect, but it may be completed with more time. The collectors and judges have been called upon for accurate returns for five years past of lands sold for arrears of revenue and under decrees of the courts.

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Average price of land per acre.—The Board have obtained from the Inspector-General of Registration a statement showing the selling-prices of land per acre, as ascertained from the actual transactions registered in the several registration offices in the presidency during the last 10 years. It is too voluminous to be attached to these replies, but a statement compiled from it is given below, which shows the price of land in each district for 1875–76, the year preceding the famine, in comparison with the collectors' estimates of the price of "good," "middling," and "inferior" land, so far as reported by them. In some instances the collectors' estimates differ widely from the figures taken from the Inspector-General's statement, but in making any comparison between the two it must be borne in mind that the latter are averages, and that nothing is known as to the relative proportions of "good," "middling," and "inferior" lands which have entered into the calculation. In Ganjam and Vizagapatam the collector's estimates are evidently too low, as the prices of the "best" wet and dry land given by him are less than the average prices of wet and dry land obtained from the Inspector-General's returns. The Board consider the registration returns to be the best guide available in regard to ordinary selling-prices, though they probably err on the side of understatement, as the full money-value of land purchased is not always shown in the deed of sale. A portion of the consideration may be paid in other ways, or given up for various reasons, or concealed in order to evade the stamp law.

AVERAGE SELLING PRICES OF ONE ACRE OF LAND.

District.	—	According to Statement submitted by Inspector-General of Registration for 1875–76.			According to Collectors' Estimates.					
					Wet.			Dry.		
		Wet.	Dry.	Garden.	Best.	Middling.	Inferior.	Best.	Middling.	Inferior.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Ganjam - -	Zemindari -	76	55	540	20	15	10	10	8	6
	Government -	26	38	—						
	Inam - -	98	51	341						
Vizagapatam -	Zemindari -	169	73	92						
	Government -	181	78	115	3 years' assessment	2 years' assessment	1 year's assessment	Same as wet.		
	Inam - -	—	—	—	25 do.	20 do.	15	do.		
Godavari -	Zemindari -	77	65	110	400	200	10	200	100	5
	Government -	46	51	109						
Kistna - -	Zemindari -	—	15	100	75 to 110	35 to 50	8 to 20	50	20	1 to 10
	Government -	46	19	160						
Nellore - -	Zemindari -	78	—	13	Not given.					
	Government -	56	35	47						
	Inam - -	60	31	95						
Cuddapah -	Government -	112	25	60	300	150	50	200	100	20
	Inam - -				400	200	80	300	150	40
Bellary - -	Government -	72	14	93	Not reported by collector.					
	Inam - -									
Kurnool - -	Government -	79	15	46	112	86	45	26	14	12
	Inam - -				110	72	63	31	20	11
Madras - -	- - -	—	—	—	1,050	375	75	375	150	30
Chingleput -	Government -	79	28	92	379 to 606	151 to 227	37 to 75	30 to 37	15 to 22	4 to 7
	Inam - -									
North Arcot -	Zemindari -	107	104	45	Not reported by collector.					
	Government -	241	91	165						
	Inam - -	—	—	—	—	—	—	—	—	—

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AVERAGE SELLING PRICES OF ONE ACRE OF LAND—*cont.*

District.	——	According to Statement submitted by Inspector-General of Registration for 1875–76.			According to Collectors' Estimates.					
					Wet.			Dry.		
		Wet.	Dry.	Garden.	Best.	Middling.	Inferior.	Best.	Middling.	Inferior.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
South Arcot	Government Inam	179	100	370	100 to 600	50 to 200	15 to 50	50 to 200	20 to 100	5 to 30
Tanjore	-	153	104	231	600	300	100	300	150	50
Trichinopoly	Zemindari	169	44	176		750 to 1,500			10 to 50	
	Government	129	62	142		250 to 1,000			30 to 150	
Madura	Zemindari	140	61	106	629	250	38	147	70	12
	Government	224	38	101						
	Inam	—	—	—	—	—	—	—	—	—
Tinnevelly	Zemindari	71	63	123	Not given by collector.					
	Government	319	61	183						
	Inam	—	—	—	—	—	—	—	—	—
Coimbatore	Zemindari	—	22	62	Do.					
	Government	361	65	249						
	Inam	—	—	—	—	—	—	—	—	—
Nilgiri	Government	—	42	88	Do.					
Salem	Zemindari Government Inam	114	39	131	100 to 400	50 to 150	10 to 50	10 to 75	10 to 50	—
South Canara	-	273	82	216	100 to 400	50 to 200	25 to 100	50 to 100	25 to 50	10 to 25
Calicut	Government	254	147	164	470	290	155	40	28	15
Tellicherry	Do.	213	57	136	488	323	180	26	19	13
Wynad Taluk	-	—	—	—	450	350	150	45	35	20

As the selling-price of land varies greatly from very many different causes, it is necessary to be cautious in drawing inferences from the figures given in the above statement. The highest average price for Government irrigated land is Rupees 361 in Coimbatore, while in Tanjore, where lands of unequalled fertility are to be found, the average price is only Rupees 153. The explanation is that in Coimbatore the irrigated area is of comparatively trifling extent (acres 85,642), and what there is is good, while in Tanjore the irrigated lands extend over the greater part of the district, and embrace a wide variety of quality. Similar considerations affect all the other figures in a greater or less degree.

If all assessments were equal in their incidence, it might be expected that on an average the selling-prices would vary directly with the average assessment. Omitting the districts of Godavari, Kistna, and South Canara, for reasons which will be noted below, and arranging the others according to the average value of irrigated land, the order will be as follows:

	Rs.
1. Coimbatore	361
2. Tinnevelly	319
3. North Arcot	241
4. Malabar	234
5. Madura	224
6. Vizagapatam	181
7. South Arcot	179
8. Tanjore	153
9. Trichinopoly	129
10. Salem	114
11. Cuddapah	112
12. Kurnool	79
13. Chingleput	79
14. Bellary	72
15. Vellore	56
16. Ganjam	26

Arranged according to the average assessment for the same year:—

	Rs.	A.	P.
1. Tinnevelly	9	7	10
2. Coimbatore	7	5	8
3. Cuddapah	6	12	8
4. Kurnool	6	2	7
5. North Arcot	5	12	4
6. Salem	5	10	3
7. Nellore	5	7	4
8. South Arcot	5	5	5
9. Vizagapatam	5	3	11
10. Bellary	4	15	2
11. Tanjor	4	13	11
12. Trichinopoly	4	2	9
13. Madura	4	2	9
14. Chingleput	3	10	5
15. Malabar	3	0	1
16. Ganjam	2	14	4

It thus appears that in nine out of the 16 districts the selling-price and assessment go pretty well with each other:—

Coimbatore	(1)	(2)
Tinnevelly	(2)	(1)
North Arcot	(3)	(5)
Vizagapatam	(6)	(9)
South Arcot	(7)	(8)
Tanjore	(8)	(11)
Trichinopoly	(9)	(12)
Chingleput	(13)	(14)
Ganjam	(16)	(16)

In two the selling-price appears to be better than it would have been if the assessment had been proportionately as heavy as in the above, viz:—

Malabar	(4)	(15)
Madura	(5)	(13)

Neither of these districts have been newly settled. Of the following five, in which the selling-prices seem to indicate heavy assessment, Salem and Nellore have been settled throughout, and Kurnool and Cuddapah have been settled in part:—

Salem	(10)	(6)
Cuddapah	(11)	(3)
Kurnool	(12)	(4)
Bellary	(14)	(10)
Nellore	(15)	(7)

Even in Nellore, however, the average selling-price is close upon ten times the assessment.

South Canara has been omitted in the comparison given above, as the area and consequently the average assessment is not known, and in the Godavari and

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MADRAS.

Board of Revenue.

Kistna deltas the whole area is assessed as unirrigated, and a water-rate charged when necessary. The prices realised in South Canara are good,—rupees 273 for wet, and rupees 82 for dry,—and the district is known to be lightly assessed. For Godovari Kistna the rates shown by the registration returns are as follows:—

	Irrigated.	Unirrigated.
	Rs.	Rs.
Godavari - -	46	51
Kistna - - -	46	19

These rates seem to the Board to be very low, but no satisfactory explanation occurs to them. It will be seen that the collectors' estimates are very much higher, viz.:—

	Irrigated.	Unirrigated.
	Rs.	Rs.
Godavari - -	10 to 400	5 to 200
Kistna - - -	8 to 100	1 to 50

The average selling-prices of unirrigated Government land in the different districts (again omitting South Canara) are as under:—

		Rs.
1.	Tanjore - - - -	104
2.	Malabar - - - - -	102
3.	South Arcot - - -	100
4.	North Arcot - - - -	91
5.	Vizagapatam - - -	78
6.	Coimbatore - - - - -	65
7.	Trichinopoly - - -	62
8.	Tinnevelly - - - - -	61
9.	Nellore - - - -	56
10.	Godavari - - - - -	51
11.	Nilgiri - - - - -	42
12.	Salem - - - - - -	39
13.	Ganjam - - - -	38
14.	Madura - - - - -	38
15.	Chingleput - - -	28
16.	Chaddapah - - - -	25
17.	Kistna - - - - -	19
18.	Kurnool - - - - -	15
19.	Bellary - - - -	14

In the case of dry land no profitable comparison can be made with the average assessment, as the variations between different districts are very trifling, and moreover a large portion of the dry land on which it is struck has no marketable value, but is relinquished at the will of the cultivator when he finds it no longer profitable to hold it.

While on this subject it may not be out of place to show the number of deeds of sale of immoveable property of the value of over rupees 100 executed in each district in the year 1875-76:—

	District.	Number.	Value.
		Rs.	Rs.
1.	Tanjore - - -	7,014	34,61,111
2.	Tinnevelly - - -	6,981	28,34,954
3.	Malabar - -	3,735	20,79,466
4.	Coimbatore - - -	3,498	14,59,517
5.	Madura - -	3,398	14,53,673
6.	Salem - - -	2,343	7,45,708
7.	Trichinopoly - -	2,307	8,75,364
8.	Godavari - -	2,285	8,28,391
9.	South Arcot - -	2,002	6,64,180
10.	North Arcot - - -	1,782	5,82,919
11.	Cuddapah - - -	1,615	4,18,531
12.	Chingleput - - -	1,604	6,82,512
13.	South Canara - -	1,550	11,84,432
14.	Bellary - - - -	1,265	4,04,612
15.	Vizagapatam - -	1,067	6,00,331
16.	Kurnool - - -	858	2,05,057
17.	Kistna - - - -	845	2,45,753
18.	Ganjam - - -	648	3,07,333
19.	Nellore - - - -	565	1,70,946
20.	Nilgiri - - -	116	2,41,542

It will be observed that, as a rule, transactions were most numerous in the districts in which the selling-prices are high.

The prices paid for land taken up for the South Indian Railway within the last few years are contrasted below with the average prices taken from the registration returns:—

District.	Average paid by Government.	Average from Registration Returns.	
		Irrigated.	Unirrigated.
	Rs.	Rs.	Rs.
1. Trichinopoly - -	168	129	62
2. Coimbatore - -	156	361	65
3. Tanjore - -	139	179	104
4. Tinnevelly - -	126	319	61
5. South Arcot - -	112	174	100
6. Madura - -	92	224	38
7. Chingleput - -	79	79	28

Amount of land on an average sold every year for arrears of revenue and for decrees of court.—The following statement shows the average extent and assessment of Government and Inam lands sold annually during the last 10 years for the recovery of arrears of revenue, and the average amount realised. A column is added to show the average selling-price per acre, and another to show the proportion of the extent of lands sold to the total holdings in the case of ryotwari lands:—

Districts.		Particulars of Lands sold.		Sale Proceeds.	Ratio of extent sold to the total Holdings for every 10,000 Acres.	Average Selling-price per Acre.	Remarks.
		Extent.	Assessment.				
		Acs.	Rs.	Rs.		Rs. A. P.	
Ganjam - -	Government (Gumsoor).	114	136	29	12	0 4 0	This is for Gumsoor taluk only.
Vizagapatam - -	Government -	1,140	2,751	1,080	139	0 15 1	
	Inam - -	6	13	184	—	31 12 8	
Godavari - -	Government -	973	2,320	3,834	13	3 15 0	
	Inam - -	288	564	1,812	—	6 4 9	
Kistna -	Government -	1,409	3,568	2,402	7	1 11 3	
	Inam - -	44	56	156	—	3 8 9	
Nellore - -	Government -	1,754	4,145	1,690	19	0 15 5	
Cuddapah - -	Government -	2,664	2,891	2,996	20	1 2 0	
	Inam -	297	390	485	—	1 10 1	This is only for nine taluks, viz., Gooty, Tadpatri, Adoni, Allur, Anantapur, Dharmavaram, Penukonda.
Bellary - -	Government -	2,711	2,983	1,512	10	0 8 11	
	Inam - -	420	318	125	—	0 4 9	
Kurnool - -	Government -	2,151	1,976	1,690	17	0 12 7	
	Inam -	1,111	903	1,269	—	1 2 3	

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MADRAS.

Board of Revenue.

Districts.		Particulars of Lands sold.		Sale Proceeds.	Ratio of extent sold to the total Holdings for every 10,000 Acres.	Average Selling-price per Acre.			Remarks.
		Extent.	Assessment.						
		Acs.	Rs.	Rs.		Rs.	A.	P.	Hindupur, and Madaksira.
Madras	Government	36	185	2,914	—	81	8	0	Extent of holdings not known, no accounts being kept.
Chingleput	Government	7,099	18,044	65,986	138	9	4	8	
	Inam	277	452	3,403	—	12	4	5	
North Arcot	-	—	—	—	—		—		
South Arcot	Government	3,390	7,716	15,310	29	4	8	1	
Tanjore	Government	665	3,038	15,058	6	22	10	3	
	Inam	—	—	—	—		—		
Trichinopoly	Government	983	1,599	5,240	10	10	1	2	
Madura	Government	1,633	2,765	5,896	18	3	9	9	
Tinnevelly	-	—	—	—	—		—		
Coimbatore	Government	1,716	1,720	1,124	7	0	10	6	
Salem	Government	6,335	8,618	4,148	52	0	10	5	
	Inam	601	1,193	5,510	—	9	2	8	
Nilgiri	Government	177	163	376	24	2	2	0	
South Canara	Government	66	216	964	—	14	9	9	Extent of holdings not known, as the district is unsettled.
Malabar	Government	7	19	798	·09	103	10	9	

Of course, the prices realised at sales of this kind afford no criterion by which to judge of the ordinary value of land in a district. If the cultivator is in difficulties solely through mismanagement, he raises money on the land himself, and, except where fraud is practised, the creditor pays up the demand, and thus, as a rule, only the poorest land is brought to the hammer. Good land is seldom allowed to be sold, unless it has been previously ascertained that the bids can be kept down by combination. In other cases, Mirasidars, notably in the Chingleput district, take up the cultivable waste in their villages ostensibly for cultivation, but really to prevent outsiders from taking up the land; they do not, or cannot, pay assessment, and when the land is sold they have it bought up by one of their relations at prices kept down by combination, and this goes on from year to year. At other times, puttahdars, with a view to defeat the claims of creditors to lands charged with debts, wilfully neglect to pay the Government assessment, and have the land sold for arrears of revenue unknown to the creditors, and bought up by one of their own relations for a nominal price, free of all incumbrances. It is not often, however, that a conspiracy of this kind can be satisfactorily carried through.

The increase of late years in the number of attachments and sales of lands for the recovery of arrears of revenue formed the subject of a thorough investigation as lately as 1875, and the results are embodied in Board's Proceedings, dated 1st April 1874, No. 754, and G.O., 7th January 1875, No. 19. These papers are given in the Appendix, as they are likely to be of interest.

It will be observed that the average extent of land sold for arrears of revenue is nowhere appreciably in excess of one-half per cent, of the total holding, except in the districts of Vizagapatam and Chingleput. No explanation of this is at hand with regard to Vizagapatam, but, as will be seen further on, the collector of Chingleput seems to attribute it to the fact that about 40 per cent. of the land is in the hands of non-resident and non-agricultural landlords, who squeeze all they can out of the actual cultivators, and evade their obligations to Government as far as they possibly can.

No accounts are available of the extent of land sold under decrees of courts, and no attempt has been made to obtain the information from the several courts scattered throughout the presidency, as it is not likely that the necessary statistics could be collected within a reasonable time. It may, however, be generally asserted that no facts have come to the Board's notice tending to show that the landed classes are being impoverished, or that landed property is rapidly passing into the hands of new men.

Quantity of land transferred to non-agricultural and non-resident landlords.—The collectors of Godavari, Nellore, Madras, Bellary, Kurnool, Kistna, South Arcot, Nilgiris, and Ganjam report that no appreciable portion of land in their districts is in the hands of non-agricultural and non-resident landlords. In Madura it is stated that the proportion is 10 per cent., but that it does not produce any injurious effects, nor have any bad consequences been observed in Vizagapatam, where more than three-fourths of the Inam lands are reported to be in the hands of non-resident and non-agricultural landlords. In Tanjore the proportion is stated to be 10 per cent., and the collector considers that in some cases injury is caused to agriculture by the renters not effecting any improvements in their lands, or by their ill-treating their sub-tenants. The collector of South Canara estimates that one-half of the land may be approximately taken as being in the hands of non-agricultural and non-resident (*i.e.*, resident in the district, but non-resident on their estates) landowners, but states that this circumstance is not considered to have any injurious effect on agriculture or on the tenantry. On the other hand, he thinks that, as these landlords are generally men of substance, they are better able, and more ready, to carry out improvements and increase the rent value of their lands than the other less well-to-do landlords who cultivate their own estates. The collector of Coimbatore makes a similar statement. He estimates the proportion at 5 per cent., and considers that it has not produced any injurious effects, non-agricultural landlords being in general wealthy men who can spend money on their estates. The collector of Cuddapah states that half of the Inams are in the hands of non-resident, and 90 per cent. of the Inams in the hands of non-agricultural, landlords, but with no bad results, as the tenants get the lands at a low rent, and make large profits. The collector of Salem estimates the proportion in the case of unirrigated lands at one-fourth, and in the case of irrigated lands at three-fourths. No injurious effects have resulted, as agriculturists who hold lands under occupancy rights from non-resident and non-agricultural classes are generally

Chap.I.Qn.14.

Madras.

Board of Revenue.

assisted by the latter with funds for the purchase of live-stock, food, utensils, &c. Chingleput seems to be the only district in which the predominance of non-agricultural holders appears to have taken an evil form. Mr. Price writes:—"A very appreciable "portion of the lands in the district are in the hands "of non-resident and non-agricultural landlords. I "should roughly say that the per-centage is quite 40, "if not more. I consider this to be the curse of the "district. Wherever there is heavy waste to be found "in the Jammabandi accounts, one is pretty safe in "guessing at once that the village concerned is either "one, the puttahdars of which are Brahmins, or else "that it belongs to a non-resident proprietor. It is "the squabbles between these people and their sub-"tenants which cause much of the waste; they "collect from the actual cultivators and squeeze them "in every way that they can, and then Government has to hunt them down in all directions "in view to making them disgorge. The man "with capital never has anything to do with these "people, as in advancing money or having anything to do with the lands leads in nine cases "out of ten to his finding himself involved with landlords whose litigiousness is a bye-word in other "districts. I have not seen since I have been in the "district half-a-dozen fairly substantial ryots."

Taking the presidency as a whole, the Board would say that absenteeism does not prevail to such an extent as to afford any cause for anxiety.

MYSORE.

Mysore.

Col. Pearse.

Mr. Krishnaiengar.

Colonel Hay.

Good dry land fetches prices varying according to quality up to an average of about 35 Rs. per acre. Wet and garden lands are seldom sold, and when sold the prices are very variable. No separate register of the extent of land sold for arrears of revenue or decrees of court have been kept. The statements sent up for sanction frequently comprise a house, the lands, and other property, but the total collections by sales for arrears of revenue throughout the division have amounted to no more than an annual average sum of Rs. 7,000 and odd for five years preceding the famine, and considerably less than half that amount was realised from land only. I am unable to give any data with reference to land transferred to non-agricultural and non-resident land-holders.

Mr. Krishnaiengar.—The price of land is regulated by its quality and position, and the following is the average in this district:—

Dry	- - -	Rupees 10 per acre.	
Wet and petty garden	„	30	„
Areca and cocoa-nut „	„	100	„

The total extent of occupied land in this district is 426,434 acres. The average amount of land sold every year for arrears of revenue is 355 acres, and for decrees of courts, 276 acres. 640 acres of land have been transferred to non-agriculturists and 703 acres to non-residents.

Colonel Hay.—During the last eight years the prices of wet and dry lands in several taluks in this division were as follows:—

No.	Taluks.	Prices of dry land per acre.		Prices of wet land per acre.	
		From	To	From	To
	Mysore district.	Rs.	Rs.	Rs.	Rs.
1	Periapatam - -	8	16	75	100
2	Nanjongud - -	8	16	100	200
3	Mulvally - - -	4	12	12½	25
4	Yedatora - -	4	8	100	175
5	Talakad - - -	12	16	100	350
6	Mundiem - - -	1	20	—	75
7	Chamarajnaggar - -	8	17	37½	150
8	Gundulpett - -	11	23	65	100
9	Ashtagram - -	1	70	150	500
10	Mysore - -	3	10	50	100
11	Heggadavenkotta - -	15	23	50	75
	Hassan district.				
1	Nagamangalum - -	1	7	4	25
2	Belur - - -	3	4	15	110
3	Harnahally - -	15	30	4	75
4	Arkalgud - -	2	4	250	500
5	Attikuppa - -	4	46	50	501
6	Manzerabad - -	—	—	15	151
7	Chennaroyapatam - -	1	4	25	500
8	Narispur - - -	1	3	25	102
9	Hassan - - -	8	20	40	255

CENTRAL INDIA.

Central India.

Mr. Wingate.

Sale of land is unknown in the Central India States. Should arrears of revenue be irrecoverable, Colonel W. Osborne (Bhopal) says the property of the cultivator, except his plough, cattle, and implements, are seized and sold. In Rutlam, Mir Shahamat Ali says the holding is transferred to an other cultivator; but this is rare, as a cultivator is usually helped as long as possible by advances.

Under these circumstances land has no saleable value, but in Baghelkhand it is said to be worth ten times the annual net profits.

HAP. I. QN. 15.

CHAPTER I.—QUESTION 15.

What are the wages usually paid to hired field labourers? Are they paid in kind or money? Give the rates as far as you can for the chief kinds of labour in ordinary years. Is the hired labourer usually able to subsist with fair ease on the grain or other payments he receives at harvest and other periods during the intervals between such payments, or is he frequently forced to borrow and forestall future payments?

PUNJAB.

Major Wace.

PUNJAB.

Delhi District.—It is customary for the agriculturists to employ field labourers for (1) ploughing; (2) weeding; (3) guarding the ripening crops; (4) cutting them when ripe. They are generally paid in money, to a man 2 annas, a woman 1½ annas, a child of 12 to 15, 1 anna, except in harvest time when they are paid in grain of about the same value. Sometimes a man gets Rs. 2 a month and his food for ploughing or guarding the crops. The persons usually so employed are of the Chamár, Koli, Ajri, Dhanak, Lode, and sweeper castes, who have most of them no other means of sustenance than field labour. Some of them make shoes, mend harness, weave cloth, and otherwise supply the wants of the village population, but they are almost wholly dependent on what they receive from the cultivators as wages for field labour, or in return for those services, all to the same extent connected with field labour. Very few inhabitants of the city Delhi work in the field.

I find little help in estimating the number of persons so employed from the census returns, but would put it at about 20,000, being 3 per cent. on the total population, or 5 per cent. on the population outside the town of Delhi. Such field labourers are not so indebted as the poorer cultivating proprietors, for they cannot easily borrow money, and for the same reason their subsistence between harvests in average years is more precarious. They do not generally get advances from the village traders, nor do they live long on grain or money previously earned, though that does keep them going for some time after the harvest; they work at the preparations for the next harvest, or get an advance from the cultivator who regularly employs them.

Gurgaon District.—The custom of employing hired field labourers is not quite general in this district, as the Játs and Ahirs, who own about one sixth of the district between them, generally do their field work themselves. The other tribes of landowners and cultivators, however, do employ Chamárs, Dhanaks, Kulis, Juláhás, and sweepers to weed and reap their crop at a money wage of 2 annas for a man, 1½ anna for a woman, and 1 anna for a child per day. Sometimes the wage is given partly or wholly in kind, the value being about the same as the cash wage. When not employed in field labour, these classes earn their livelihood by weaving cloth, making shoes, mending harness, sweeping villages, and otherwise providing for the wants of the villagers, who in this district generally pay them for these services in cash, and not by an allowance of grain at harvest. The census papers of 1868 (Statement IV.) give little aid in estimating the number so employed. I should put it down at 55,000, or about 8 per cent. on the total population.

The condition of these field labourers is not inferior to that of the poorer agriculturists who cultivate holdings of their own. They are not so much indebted, as they have nothing to mortgage; they do not generally get credit from the village trader, but sometimes get wages in advance or borrow a little from each other. In an average year they subsist with ease from harvest to harvest on their earnings during the last harvest and their wages for odd jobs and the profit on their cloths, shoes, &c.

Karnal District.—1. It is customary to take labourers in a kind of agricultural partnership, where they receive a fixed share of the produce, and bear the same share of the expenses of cultivation, and often of the revenue also. These men contribute their bodily labour only, and do much of the harvest work. The employer advances money varying in amount from Rs. 15 to Rs. 50 free of interest, and a further sum, as necessity arises, on interest at 3 pies per 1 rupee monthly. This debt is looked upon as a "body debt" (sarír ká karzah), and landowners often grumble at our refusal to enforce it as such by compelling the debtor to labour until it is discharged. If the employer is changed, the new employer repays the old one the sum so advanced. The advance is made by a credit with the bania; accounts are settled at harvest time. These people are, as a rule, very slightly, if at all, worse off than the very small owners and tenants so long as they are in full bodily vigour; but as their remuneration varies with the produce, they are wholly dependent upon the season; and when they get old they are unable to find employment. They belong to all sorts of castes, chiefly but not wholly menial, and are sometimes Játs, Brahmans, &c.

2. The Chamárs often furnish to a given plough one man from a family, who works on much the same terms as above. One member of the family will work one day, and another the next. Most Chamár families furnish one such labourer. They follow at the same time their trade of leather curing and working; and are as a rule well off considering their position. In a famine year the number of cattle which die go far to compensate them for the diminished yield of the cultivation. They are paid at harvest time, and get one-fortieth of the whole yield of the plough on which they work in consideration of their labour, and in addition to what is given for boots, straps, whips, &c. No money is advanced to these men.

3. There is a certain very small number of agricultural labourers hired by the year on fixed pay. They belong to no particular caste, and are chiefly found in the towns and in villages owned by Sayads and others who will not do manual labour. There are very few of them in other villages. They get 9 to 10 maunds of grain a year and their morning meal, or all their food and 0–8–0 a month, or two meals a day and clothing and Re. 1 a month, or Rs. 3 a month, one meal a day and some old clothing and pair of boots every half year; or Rs. 4 a month with or without one meal a day. They always get double pay in the two harvest months. They are of course very poor, more so than the poorest agriculturist.

4. Occasional labour is resorted to at certain seasons, chiefly at harvest time, when rice is being bedded out, and when sugar cane is being cut and crushed. The labourers usually consist of the menials of the village, and of the villagers of the high lands, who reap their yearly grain crop and then go into the low villages to help in the harvest. The wages vary from 3 to 6 or 7 sers of grain a day; and I have known 0–8–0 a day paid at harvest when a sudden hot wind ripened all the crops at once. This class of labourer includes the poorest of the people, and also really well-to-do agriculturists and others, who are attracted by the high wages offered.

5. It is almost impossible to estimate the number of these respective classes of hired labourers. Judging from my settlement figures, I should say, class I. from 3½ to 4 per cent. class II. 3 per cent., and class III. ½ to ¾ per cent. of the adult male population; class IV. is altogether too fluctuating to allow of any esti-

mate. But the above figures are little better than guesses. The adult male population of the district is about 188,000.[*]

Umballa District.—In this district there are few well-to-do agriculturists, hence they never employ any permanent hired field labourers. It is only for weeding the kharíf crops of cotton and makki, and at the rabi for the sugar-cane, tobacco and poppy crops, that hired daily labourers are entertained for two or three days at the most. The rates of wages vary according to the amount of work the labourer is able to perform; the daily labour wages range from 2 annas to 4 annas. At reaping time hired labourers are also required, but they are not paid in money; they receive as wages a load or bundle of the crop they have cut, and which perhaps may yield 4 or 5 seers of grain. There is no special class employed in field labour, but generally Chamárs of the village or other indigent persons who have no particular means of livelihood. This kind of employment at the most never extends longer than one month at a time. At other times, when not engaged in field labour, these employés work in the town as coolies, or perhaps work leather or weave

From the census papers (1868) about 10 per cent. of the whole population of the district, or 103,400 (47 per village on 2,200 villages), may be assumed to work at times at field labour. The condition of this class (field labourers) is no doubt very inferior to that of even the very poorest self-cultivating proprietors, and they never have anything in hand; in short, live from hand to mouth, and in seasons of famine stream out of their villages into the towns, having nothing to fall back upon, and no credit with the village bania, and except here and there, where employed as permanent ploughmen or herdsmen perhaps, they get no assistance from the village agriculturists. In short, in times of distress and scarcity and high prices, these poor wretches are in very evil plight. They have no credit account with the village banker or money lender.

Hoshiarpur District.—It is customary for the agriculturists of this district to employ paid field labourers.

They are principally employed for weeding and hoeing (godai) and for cutting the crop at harvest; employed in weeding and hoeing they are called "godáh"; for cutting at harvest, "laweh."

They receive at hoeing time 2 annas per diem, or 2 annas and food, or sometimes 2½ annas without food, or sometimes they are paid in grain.

At harvest time a very common way of paying them is to give them one sheaf, or half a sheaf, of grain (the sheaf contains on an average about 8 seers pakka of grain) according to the price of grain at the time.

These labourers are principally of the Chura (sweeper), Chamár, (currier), or Juláha (weaver) castes. But Zamíndár classes themselves, such as Bhats, Ját, Saini, Gujar, also occasionally work for hire in the field.

They cannot be said to form a class by themselves in the character of field labourers. Most of them have other means of livelihood, *e.g.*, the Chamár prepares skin and horns for the market, the Churas sweep the village houses, the Juláha has his loom and weaves cloth. At the same time the people who take to labour in the field when opportunity offers are mostly of a very poor class; and have, as a class, difficulty in eking out their subsistence by manual labour of various kinds.

I do not think the number of such persons is less than 70,000, probably more; I estimate it at about 7 or 8 per cent. of the total population of the district.

The above does not take account of ordinary field servants, or "*kámahs*," who are employed by the Rájpút landowners generally, and by all the richer Zamíndárs. These are employed all the year round, and engage in all field operations. They receive Rs. 1-8 and Rs. 2 per mensem and food and clothes.

I think this class, *i.e.*, "kamah," may amount to about 10,000 persons, or 1 per cent. of the population, probably not more.

The position of both, whether kamah, *i.e.*, regular labourers, or godáh or laweh called in at harvest or weeding time, is distinctly inferior to that of the poorer agriculturists who cultivate holdings of their own, because their livelihood is somewhat more precarious and they have not security of land or occupancy right, on which money can be raised by those who cultivate holdings of their own.

They live as a rule from hand to mouth by the daily labour of their hands, and cannot get much credit with the village trader.

Sialkot District.—It is customary for Zamíndárs and other landowners of good position to hire labourers for the cultivation of their fields; the work in some instances being such as to require the permanent employment of labourers throughout the year; and in others they are employed for a time only just as necessity arises for their services. The permanent class of labourers are paid in kind, viz., 20 seers on every máni (= to about 12½ maunds kacha) of crop sown, besides food three times a day and clothing. The other class, or temporary labourers, are paid in cash at the rate of Re. 1 per month and food and clothing in addition. The persons usually employed are of the Chura, Meo, and Bhatwar castes, and principally resort to this sort of work for their sustenance, though, in case no such employment could be got, they follow their own special avocations elsewhere. The private servants of the landowners, such as the washerman and water-carrier, also labour in the field, but receive no extra remuneration.

When the sowing and harvesting seasons arrive extra labourers are hired, and are paid generally according to the crops they work at; those employed in the sowing of munji, a kind of rice, get 5 seers of grain daily each, and the harvesting labourers get 1 "bhari" or sheaf of whatever grain they cut, and the out-turn of which never exceeds 10 seers; and those employed in the weeding of sugar cane, cotton, and maize get food twice a day, or in lieu 1 and 1¼ seer of grain per diem each, or 2 annas in cash, whichever they choose to select; and those employed in ploughing get the same wages as the last mentioned. The total population of the district is 1,005,004, out of which 183,291[*] are employed as field labourers, or a little over 18 per cent. of the total population. The condition of the field labourer in comparison to an agriculturist who cultivates himself is decidedly inferior in respect to affluence; he cannot subsist entirely on his labour in the field, and he is obliged to take some other work as an additional help. The labourers can generally obtain money from the village banker when they need it, and they settle with him when the harvest is reaped, or whenever they happen to have sufficient wherewith to do so.

Mooltan District.—Hired labourers are employed by all the richer Zamíndárs, who are above following the plough themselves, for their "*khud kásht*"[†] lands. They are employed for all farming operations, and receive wages sometimes in kind, sometimes in money, sometimes in both, amounting to from Rs. 3 to 5 a month. They are of all classes, except Sayads and Brahmans; they cannot be said to form a class apart; they are the outskirts of the tenant-at-will class. A tenant loses his bullocks or gets into trouble, and he works as a labourer till he can recover himself. On the other hand, a Zamíndár takes a fancy to a labourer who has worked for him for some time, and he gives him some lands, advances him money for bullocks, and sets him up as a tenant. Sometimes, too, a small proprietor meets with a temporary difficulty; in the Rawa,[‡] in long continued drought cultivation is impossible; the

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[*] The census returns say 106,165.

[*] This is clearly an excessive estimate. The total adult male agriculturists numbered only 142,819. There cannot be more than one labourer to every agriculturist.—*E. Wace.*

[†] Their own home farm.

[‡] Dry lands, not irrigated nor alluvial.

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PUNJAB.

Major Wace.

proprietor then sends his cattle to graze in the Bár and goes to work as a labourer until better times return. These labourers generally live on their wages with ease; they may run up petty scores for food in their bazár, but they cannot get into serious debt. But their condition is inferior to that of the poorer tenants, inasmuch as it is generally when a tenant is ruined that he becomes a day labourer; as long as a man is a tenant he has no want of the actual necessaries of life, nor has the labourer, as a rule, but he may have at any time,—at least there is the possibility of this, but I have never known it to occur practically. The demand for labour has always been in excess of the supply, and the agricultural labourers work on steadily all the year round.

Jhang District.—It is *not* customary for the agriculturists of this district to employ hired field labourers. Such labourers are very few. The mass of cultivation is carried on by tenants-at-will paying grain rents of half produce. Many of these tenants are given advances (known as takávi) of money, oxen, seed, &c., when they first commence to cultivate their landlord's well. Cultivators of sailáb lands are not given advances. The wages of a hired labourer consist, as a rule, of the following items:—His food daily; Rs. 1–8 cash per month; 2 chaddars, 2 loin cloths, 2 pagris, 2 pairs of shoes, and 1 blanket per annum. The material item is of course the food of the labourer, and this is sometimes very cheap and sometimes equally dear. These labourers are, as a rule, poor Játs. They do not practice any craft. They get their living entirely in this way. As there is usually a considerable demand for labour, there is no fear of their starving if they will work. I cannot give any estimate of the number of these labourers. They are very few—probably not more than 1 or 1·5 per cent. of the total population.

These labourers, so long as they are in employ, are well off, but the nature of their wages prevents their saving anything. They live better, *i.e.*, have better food, than the poor agriculturists who cultivate their own lands or the tenants-at-will paying batái. They are generally unmarried and without any encumbrances.

Peshawar District.—In this district hired field labourers of three descriptions are employed.

(*a.*) These who receive monthly wages which amount to Rs. 4 or 5 in cash without food, or 1–8 or Rs. 2 in cash along with food. They are employed in every description of agricultural work.

(*b.*) Those locally known by the name of *charakar*, who are indebted to their masters for sums ranging from Rs. 30 to 150, and are under engagement to give their services as agricultural labourers till such time as the debt is paid off. Plough bullocks, seed, &c. are furnished by the employer. These labourers are paid by a share of the crop in kind, which is usually from $\frac{1}{4}$th to $\frac{1}{10}$th. They feed themselves.

(*c.*) The labourers who are specially employed as cattle herds or crop watchmen. The former are paid at harvest by receiving 15 seers of grain (barley or joár) for every head of cattle grazed, or sometimes the payment is calculated not in the cattle, but on the owners or their houses. The latter are also paid in kind at harvest; they receive 1 seer per maund of grain out of every crop.

There is no tribe specially devoted to these occupations. When not engaged in agricultural work, they are ready to do any sort of miscellaneous labour. Their numbers are about 2,854, which is a per-centage of 0·55 per cent. of the total population. There is no material difference in the condition of such labourers and that of the poorer agriculturists who cultivate holdings of their own. The *charakars* are generally in debt; they borrow money under promise of paying it back at harvest, but with that exception the labourers are well able to live upon their earnings. Those who watch crops are, as a rule, very well off.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

'apt. Pitcher.

In the Muttra, Mainpuri, and Cawnpore districts cash payments would appear to be most in vogue, but elsewhere the replies indicate that in ordinary years payments are mostly made in kind. During the past year, however, either owing to the fluctuating nature of grain, rates, and their height, or owing to zamindars having less grain on hand than usual, payments have been made in cash. Such payments have been at lower rates than what the payments in kind of ordinary years would represent in cash. Necessarily, save where Government relief works came into competition, people were anxious to work at any rate. In May last, when discussing with a zamindar the *pros* and *cons* of a bund upon the making of which I had set my heart, he remarked with emphasis, "Now 'is the time to get the work done, as labour can be "got so cheaply."

The hired labourer ekes out his gains at harvest time by selling grass, cutting wood, repairing houses (an operation always carried on at slack seasons, when the owner can sit all day, taking care that the labourer does his full tale of work), carrying loads of grain, wood, cowdung fuel, fruits, &c., to market; protecting fruit, groves, or ripening fields from the depredations of birds and other thieves, &c., &c.

A labourer's earnings depend of course on his industry, and in ordinary years there are always fair earnings to be got for the industrious. A lazy fellow who only works when forced to do so, for as much as will keep him alive, is sure to be well known in the village, and to find it impossible to borrow or forestall. The industrious borrow and forestall as much as they can, not to gratify personal extravagance or tastes, but to meet caste obligations in the way of marriages, burials, funeral rites for their ancestors, &c., obligations which the most honest of the poor would rather face death than attempt to evade. It may safely be stated that the majority of industrious labourers owe some sum, small or great, and are ever ready to borrow or forestall when credit is to be got. That credit is given so generally is due to the solemn obligations resting on children to discharge the debts of their fathers.

In towns a numerous class of money lenders are to be found who deal with the labouring poor almost exclusively, lending small sums of Rs. 2 or so, at high rates of interest, repayable by daily payments of perhaps as little as a pice. For the collections of these petty sums Brahmans alone are employed, a fact due no doubt to the superstitious feeling on the part of Hindus against refusing a Brahman's reasonable request, and a relic of the times when Brahmans were sent to sit "dharna" at the doors of impracticable debtors.

These collectors go their daily rounds, and for each default "chalk" up a mark over the debtor's doorpost. It would surprise many of those who hold a low opinion of Asiatic morality to see how large an average of good faith exists on the part of the money lender, who keeps the only written record of payments; on the part of the collector, who commits his collections to memory; and on the part of the debtors, who never venture to tamper with the writing on the wall.

These loans are sometimes contracted for the purpose of carrying out some small business or petty contract, but mostly for marriages, and very often to help some neighbour neither related by blood nor connected by caste, but simply without credit.

The labourer's life is hard enough in all conscience. One of the last scenes is frequently a visit from his various creditors, who come and make their demand while he lies on his death bed, so that the heirs of his cooking pots and mud hut may be advised. It is a common plea on the part of the heirs-at-law when resisting a claim against the property of a man lately dead, that the creditor failed to make any claim while the man lay dying.

CHAP. I. QN. 1.

NORTH-WESTERN PROVINCES.

Capt. Pitcher.

STATEMENT showing Rates of chief kinds of Labour in ordinary years.

District.	Weeding and Digging, &c.	Irrigating.	Harvest operations.	Artisans.	Ploughmen or permanently employed Servants.	Remarks.
Maerut	In cash 2 annas, usually the value in kind	—	1 bundle in 20, 1 in 14 for cotton	4 annas a day	—	Sugar-cane labourers 4 annas a day.
Meinpuri	6 or 7 pice	2 annas	1 do. in 20	—	Rs. 2-8-0 per mensem, with a blanket occasionally.	
Muttra	Rs. 3 a month or 2 annas a day	—	3 seers extra of harvest labour	—	Rs. 3 per mensem	Sell grass in off seasons.
Etáwah	1 anna 6 pie to 2 annas in kind	—	—	4 annas to 5 annas	—	
Aligarh	1 anna 6 pie	—	5 seers a day, and straw with it	—	Rs. 2-8-0 or Re. 1 and food	
Farukhabad	1 anna 6 pie to 2 annas in kind	2 annas and food	1 in 20	—	Rs. 3 per mensem.	
Muzaffarnagar	2 annas usually, but this year 1 anna 6 pie	—	2½ annas a day	—	—	Eke out by sale of grass, buildings, &c.
Bulandshahr	Rs. 3 a month	—	—	—	—	No other particulars given.
Budaun	2½ seers, grain	—	1 in 20	7 annas to 7 annas 8 pie.	—	
Moradabad	1 anna to 2 annas 6 pie	1 to 2 annas and a meal.	1½ to 2 seers or 2½ annas	—	6 annas a day for hire of man and bullocks.	Get advances for labour from zamindars.
Cawnpore	2 annas to 3 annas	—	—	—	—	
Mirzapur	1½ to 2 seers, with chabena extra	¾ of a seer, with chabena and cane-juice.	¼ seer gur daily when working at sugar-cane as well as wages.	—	A piece of rent-free land near their house.	Re. 1 cash and a blanket per annum extra to permanent servants.
Gházipur	1 anna or 2 seers coarse grain	1 anna	—	—	1 anna 6 pie	Labourers get 1 bigha ploughed and sown for them free.
Benares	2 to 3 seers, this year 5 pice	—	—	—	—	
Gorakhpur	1 anna or 2 seers coarse grain	1 anna	2 seers wheat, or 4 seers coarse grain	3 annas	9 pie	This year payments have been in cash.
Tarái	1 anna to 1 anna and 6 pie	—	—	—	Rs. 2 to 3 per mensem	A blanket and pair of shoes annually to regular servants.
Kumaun	No regular labourers; people help each other in all farming operations.	—	—	--	--	In the bhábar ¼th of the crop.
Garhwál	2 seers a day of millet, 2 annas in tea gardens	—	—	7 annas 8 pie	—	
Jalaun	1 anna to 1 anna 6 pie kharíf, 0-1-6 to 2 ans. rabi	—	2 annas to 3 annas	—	—	Forestal their earnings, pledging their labour.
Lalitpur	9 pie, men; 6 pie, women	—	—	—	Rs. 1-8-0 per mensem	Hire of 7 yoke of bullocks 4 annas a day, and an occasional blanket.
Sháhjahánpur	1 anna to 2 annas	—	1 in 20	—	Rs. 2-8-0 ditto.	
Lucknow	This year 5 pice, 1 anna to some, or 2 seers	7 pice	—	16 seers on each plough.	Rs .2-8-0 and food	Eked out by carrying loads and selling grass.
Bara Banki	This year 5 pice, or 3 seers kodo	—	1 in 16 rabi, 1 in 13 kharíf	—	—	House repairing, sell grass, carry loads.
Unaó	1 anna 6 pie with ¾ seer chabena	—	—	—	½ a bigha with seed, 3 mds. at rabi, and 3 at kharíf.	
Rae Bareli	This year 5 pice, usually two seers	3 seers	—	Well diggers, 2 annas.	—	House repairing in the slack season gives work.
Partabgarh	1 anna 3 pie to 1 anna 6 pie	—	1 in 20.	—	—	
Fyzabád	1 anna to 2 annas; cultivators afford mutual help	5 seers or 2 annas	—	—	Rs. 2 to 2-8 per mensem	5 pice a day wage during scarcity.
Gondá	1¾ seer	2 seers	1 in 16	2 annas	2 seers a day.	
Kheri	1 anna a day	—	1 in 16 and 5 seers treacle	—	Rs. 2 per mensem	A blanket, or petticoat for the women.

.I. QN. 15.

ENGAL.

. Toynbee.

BENGAL.

The rates of wages of agricultural labour are given, district by district, in column 9 of the statement appended to question 13. Harvest labour is, as a rule, paid for in kind throughout Bengal; ordinary field labour at other seasons partly in money and partly in kind. The hired labourer working near his own village is able to subsist in ordinary years on the wages he receives for his labour; but it is a bare subsistence, and little else; for purchase of clothes, for a wedding, or funeral, or any other similar expenses, he has generally to borrow either from his landlord or employer, or from the village mahajun. He is in a chronic state of poverty and indebtedness, and in many parts of Bengal is little better than a slave attached to the land on which he squats. For skilled labour the rates are generally at least double those paid for field labour, and such labourers as are willing to work away from their houses on public works earn very considerable sums.

ENTRAL
ROVINCES.

Nicholls.

CENTRAL PROVINCES.

Saugor, Major Bloomfield.—An agricultural servant engaged for the 12 months is paid :—

Rs. 2 per mensem = 24 Rs. per year.
1 blanket, value Rs. 1,—in the rains.
1 quilted jacket, value Rs. 1 to 0–12–0,—in the cold weather.
2 pairs of shoes, value 0–6–0 to 1–0–0,—in the year.
2 rotis, made of $\frac{1}{4}$ to $\frac{1}{2}$ seer of flour,—every day. Flour is generally $\frac{1}{2}$ anna per seer, so this would cost $\frac{1}{8}$ anna daily, or from 365/8 ÷ 16 = Rs. 2–8–0 to say Rs. 5–0–0 a year.

At sowing time $2\frac{1}{2}$ seers of the grain sown. At harvest one bundle of grain, with straw (about $2\frac{1}{2}$ seers of grain), every day during the harvest.

Women employed on daily wages earn about 2 sheaves of grain (value about 2 annas) daily, or about 2 × 30/16 = Rs. 3–12–0 per mensem in the harvest time.

Piece work (called kutha) is given at harvest time, the reaper being given one bundle in every 20 cut, or 5 per cent. In this way a man can earn four bundles, value about 1 anna each, or 4 annas to 6 annas a day.

At Chilora, 10 miles from Saugor, the people are said to get $2\frac{1}{2}$ to 3 Rs. per month, but everything else the same.

At Baroda, 14 miles east of Saugor, they receive Rs. 2 to 2–8–3 per mensem, with miscellaneous articles, as above.

At Bali, 12 miles east of Rahli, if employed for a short time, they get Rs. 3 per mensem, or for all the year round 30 seers of wheat (value 1–4–0) and 30 seers gram (1–0–0) or Rs. 2–4–0 per mensem, besides the miscellaneous articles mentioned above.

It appears that much of the farm labour in Bilaspur is performed by partnership arrangements.

One way is where the labourer gets after harvest one quarter of the total produce. In other cases he has assigned to him about an acre or an acre and half of land, for which the employer pays the rent, and on which the labourer works in his spare time. Apparently he works two days on the employer's land, and on the third day, using his master's cattle, on his own patch of ground. He can get money advances without interest, but for grain lent to him he repays with sawai in kind. The wages of a woman or boy, paid in grain, is equal to 3 pice to 6 pice, according as grain is selling cheap or dear. The quantity does not vary, being two seers of unhusked rice a day.*

Raipur.†—The purely labouring classes in the district form a very small minority of the population, as almost all have some small plot of their own, which they cultivate with their own or hired bullocks. At the head of the labouring classes stand the ploughmen, who receive as wages one quarter of the crop they plough. This high rate of payment was fixed in times long past, when grain was much cheaper than at present, and is retained now owing to the continual advance of this class to independence. As soon as they scrape together enough money to buy a pair of bullocks they set up on their own account, and this constant upward movement keeps up the rate of wages, though grain is now nearly 12 times dearer than it was 20 years ago. In former days almost every ryot who owned four bullocks kept his ploughman, but of late years their services have become two costly a luxury for any except rich ryots and Malguzars.

The rest of the labouring classes consist of those who depend upon occasional jobs, and are called locally "bhootiar." When employed on farm work they are paid as follows :—

For weeding—one kata of paddy daily = $3\frac{1}{2}$ seers.
For cutting—two katas do.
For treading out—two katas do.

Rice huskers and owners of oil presses are not paid wages, but do the work by contract, the rice husker giving eight katas of husked rice (chawal) for 20 katas of paddy, and the oil pressers giving oil in the following proportions :—

One seer of oil for five seers of linseed.
One " of " for four " tilli.
One " of " for four " castor oil.

One seer of seed, or about 20 per cent., being supposed to be his profit, the same as is given to the rice husker.

Rate for the chief kinds of labour.—The wage of domestic servants have increased greatly of late years. In 1861 Tahsil chaprassis got 3 Rs. in cash a month, a good syce could be got for that monthly wage*; a day coolie got $1\frac{1}{2}$ anna, a woman 1 anna.

Tahsil chaprassis now get from 5 to 6 rupees, with compensation for exceptional dearness of grain, and an expectation of pension, and fitting men could not be obtained for less. A good syce can now hardly be got for Rs. 6 a month.

The following rates are now paid in the Ramtek pán gardens for occasional help: a man $2\frac{1}{2}$ to 3 annas, a woman 2 annas, a child $\frac{1}{2}$ anna; where the engagement is for the month a man gets from 4 to 5 rupees a month, varying with his capabilities, a woman or a middling sized boy 2 annas.

Hamals engaged in loading railway waggons when in steady employ get Rs. 7 a month, but generally hey work in gangs on contract work, and can earn up to Rs. 12 a month, and in times of pressure more than double this amount.

Ordinary village carpenters, masons, and smiths earn in Nimar Rs. 20 a month, in Nagpur and Wardha 15 rupees, and 15 also in Chhindwara, Jubbulpore, Hoshangabad, and Sironcha; while in Bhandara, Chanda, Seoni, and Mandla Rs. 12 is the ordinary rate. In Saugor and Damoh their earnings are from 8 to 9, and this is about the rate for Chhattisgarh.

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* NOTE.—My informant is Bechi Lal, late forest darogah of Bilaspur, an intelligent man, who had been very many years in the district, now a darogah in the Excise Department. I have also my own recollections and the Raipur Settlement Report to corroborate.

† From Mr. Hewitt's Settlement Report, 1869.

* NOTE.—Wheat was then selling at Jubbulpore at 64 seers rice from 32 to 48 seers, for a rupee.

CHAP. I. QN.

CENTRAL PROVINCES.

Mr. Nichol.

The wages paid for unskilled labour in the Empress Spinning and Weaving Mills at Nagpur are—

Able-bodied men - -	6 to 9 rupees a month.
Women - - -	3 to 5 „ „
Boys (who do most of the work)	4 to 5 „ „

There are still very few of the Koshti (the weaving class) who came for employment at these mills.

Skilled hired servants working for the native cotton weavers (koshtis) in the towns of the Nagpur district earn from Rs. 6 downwards. As a rule, these men have served an apprenticeship.

The servants of mahajans, who run errands and do the work of dunning, get Rs. 4 a month and perquisites. Their stipulated wages have doubled within the last 15 years.

I am fully satisfied that the rise of wages has been general, and has been continuous since 1862. The increase has been fully 33 per cent. for agricultural labour.

I think it may be said that a steady villager of good character and some knowledge of farm work, and in good health, need not be without employment at any time of the year. And there is always spinning, cotton cleaning, husking rice, and cleaning grain open to their wives and children; and for themselves thatching, rope making, repairs to houses, and agricultural plant are generally available.

I will calculate the earnings of a village labourer, who is not in very favourable circumstances for saving, that is, one who has only one boy able to work and only one girl, but I will suppose they enjoy fair health.

—	Seers.	—		
		Rs.	a.	p.
The husband; 60 seers × 12 months - - - - - -	720			
perquisites - - - - - - - -	38			
cash - - - - - - - -	„	2	0	0
The wife; weeding, harvesting, &c., 3½ months - - - -	„	10	8	0
spinning, &c. - - - - - - - -	„	8	0	0
A boy of 12 years; 38 seers, say, 10 months - - - - -	380			
A girl of 9 years; harvesting and weeding, 3½ months - - -	„	5	4	0
Gleaning and grass cutting, &c., of the wife, boy, and girl - - -	„	1	0	0
Total earnings Seers	1,138	26	12	0
Consumption of grain by family under - - - - - -	800			
* Balance at least 8½ maunds - - - - - - - -		20	0	0
Total - - -		46	12	0
Expenditure in cash, clothing at Rs. 6 a head - - - - -		24	0	0
Condiments, salt, oil, &c. - - - - - - -		12	0	0
Savings - - - - - - -	Rs.	10	12	0

* Valued at present high rates. For the balance they could obtain very nearly retail rates.

This surplus of Rs. 10–12–0 would be much reduced when their surplus grain has to be sold at much lower rates. It is therefore quite clear that the hired labourer paid in grain (so long as work is available), is better off when prices are high than at other times, and while he profits by high prices the man paid in cash must suffer.

In villages near jungle tracts wages will probably be lower than I have assumed, but here he is, I think, more than compensated by the mhowa and wild fruits picked up at no appreciable cost by the members of his family. Mhowa will, I think, replace double its weight of grain, on alternate days for four or perhaps five months of the year.

From this margin of Rs. 10–12–0, or less, he can provide something for sickness, or for holidays. He will have in course of time to marry the boy and also the girl. This will cost him about Rs. 12–0–0 on each occasion. With more boys, with fair luck and health, with steadiness and frugality, he ought in the course of six years to be able to raise himself to the position of a cultivator, and any malguzar, whether resident or non-resident, would prefer such a man as a tenant (rather than an embarrassed man born in the grade of cultivators), and the malguzar would be glad to give him a helping hand.

Almost always when a steady village labourer engaged by the year is in want of temporary help, he can obtain an advance of a few ruprees from his employer without interest. The amount of indebtedness of the whole class to their employers is in ordinary times quite insignificant, and they clear themselves at harvest time. They are also, I may say, free of debts to the Banias. I consider then that the hired agricultural labourer is usually able to subsist with fair ease on his earnings. But there is always the fear of a long and incapacitating illness hanging over a family. Even in this respect there has been, I am everywhere assured, a marked improvement of late years; I am told that there are more old people to be seen, and long fevers preventing labourers from earning their living are much less common.

Wardha, Mr. Bapu Rao.—Men only are employed as farm labourers by the year. They get from 40 to 50 seers of jowari a month, and a single cash payment from 1 to 4 rupees. Sometimes a blanket and a pair of shoes also are given.

If it be stipulated that wages are to be paid in cash, he will get from 32 to 35 rupees in the year. Servants are fed on three holidays in the year, or else get a present of 5 seers of jowari and wheat.

At harvest time they get a present from the new grain from 10 to 30 seers of jowari. The servant is shaved at the master's expense.

The barber gets from 12 to 25 seers on each plough, and shaves all the male members, servants, and visitors of the cultivator.

The smith and carpenter get double of what the barber is paid, and does all the work required by the cultivator in respect of his agricultural tools and plant.

The Patwari and Astrologer get their trifles in kind at the harvest.

AP.I. QN. 15.

CENTRAL
ROVINCES.

WARDHA.

r. Bapu Rao.

Mr. Laari.

The following rates are paid to hired field labourers :—

	Men.	Women.
1. Removal of old stalks of jowari and cotton from dry fields.	Not employed. If any work willingly, the same rate is paid as for woman.	1 anna per diem.
2. Assisting the ploughman in sowing.	Not employed - - -	1 anna per diem.
3. Weeding - - -	Not employed - - -	From 3 pice to 5 pice, *i.e.*, from ¾ of an anna to 1¼ anna.
4. Picking up cotton at the first and second picking.	Twelfth part of the cotton picked, which is from 2 to 3 seers per diem; and half for the third picking, which gives from 1 to 1½ seer per diem.	Same as for men.
5. Cutting jowari plants - -	5 seers of jowari per diem - -	Not employed.
6. Binding sheaves of plants -	Do. Do. - -	Do.
7. Cutting ears of jowari from stalks.	Ears sufficient to yield about 5 seers of jowari per diem.	Ears sufficient to yield about 2½ to 3 seers of jowar per diem.
8. Threshing - - -	5 seers of jowari per diem - -	Not employed.
9. Reaping wheat - -	Same as No. 1. - - -	2½ seers of wheat per diem.
10. Do. linseed - -	Do. - - - -	1 anna per diem.

If any man does not get employed by the year, then he works by the day. Such a man and his wife earn about as follows during the year :—

	Cash.	Grain worth	Total.	Annual Expenditure in living.	Balance.
Men - - - -	Rs. 4	Rs. 28	Rs. 32	Rs. 32	—
Women - - - -	Rs. 10	Rs. 6	Rs. 16	Rs. 16	—
				48	

This is the average income of a village labourer. But should he and his wife be specially strong and industrious, they get much larger wages, and by frugal living save sufficient in a few years to buy a pair of bullocks to start cultivation. The average income which a labourer gets is generally sufficient for his wants, but he has often to borrow money or grain for his maintenance at times when he finds no employment for a considerable period. Instances are known of labourers being in distress, but generally they get enough to live on.

Wardha, Mr. Laurie.—Hired field labour is of several kinds. Mr. Elliot in his Hoshangabad Settlement Report has given a convenient summary of the services in agriculture which are performed by wages-paid labourers, and I will follow his enumeration as far as it is applicable to this district. Without dissertation of any kind, I put in tabular form the information I have gained from consulting Malguzars of all parts of the district on the rates of wages and the method of payment, so as to reply to queries (1), (2), and (3) of this group.

Labourer.	Wages.	Remarks.
1. Ploughman (regular, *i.e.*, employed all the year round).	60 to 70 seers of jowari *per mensem*, now worth from Rs. 3 to Rs. 3-8-0.	He also often gets a pair of shoes and a *kamal* or blanket as perquisites. When not ploughing he is employed in *rakhwali* and other jobs.
2. Ploughman (occasionally employed by the day for some special work).	2½ to 3¾ seers of jowari a day, now equal to from 2 to 3 annas a day.	
3. Sowing, *i.e.*, feeding the drill.	5 to 6 pices a day - - -	Usually work for women.
4. Weeding—		
(*a.*) Men - -	1½ to 2 annas a day - -	The rate varies according to the supply of labour. The payment is made daily for such as are very needy; for those who can afford to wait it is made weekly. The demand for pice at the beginning of the weeding season sometimes causes the coin to sell at a premium of a pice or more in the rupee with the local money-changers.
(*b.*) Women -	3 to 4 pices a day.	
5. Stubbing (*i.e.*, clearing ground of roots, &c.) *In Arvi.*	1 rupee for 20 cubits of land stubbed in Arvi. This work is done elsewhere with the plough.	

Chap.I. Q

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Labourer.	Wages.	Remarks.
6. Watching - - (*Rakhwali.*)	60 seers a month for two months, or 2 seers a day. When on daily rates $3\frac{3}{4}$ seers a day.	Usually the ploughman is employed.
7. Reaping—		
(*a.*) for jowari -	$3\frac{3}{4}$ to $5\frac{1}{2}$ seers of jowari a day=$2\frac{1}{2}$ to 4 annas a day.	
(*b.*) for wheat -	One out of every 20 "pendies" or big sheaves of wheat cut, *i.e.*, 5 per cent, of the amount cut by the reaper. A man is generally able to cut 20 pendies in a day.	
(*c.*) for tilli -	Daily labour rate.	
8. Winnowing - -	$3\frac{3}{4}$ seers a day - - -	Work generally done by the cultivator and his regular servants.
9. Cutting hay - -	From 10 or 12 annas to 1 rupee the 1,000 pullas.*	$3\frac{3}{4}$ to 5 seers of jowari is thus the average daily wage that is paid in kind. Most hired field labourers are thus paid, weeding alone demanding the use of coin, as the work does not itself bring in anything immediately useful. As the food of a man in full work is only a $1\frac{1}{4}$ seer, there is a possibility of laying by two or three days' food for every day of work. If the harvesting periods (at both seasons) do not extend beyond three months, a man could even thus subsist himself in the slack time. But he has generally children to maintain, and there are other needs to supply, so that he † probably gets into debt, if any one is rash enough to lend to him. The fact that weeding is paid *weekly* shows that the weeders have something on hand to help them going at first.
10. Picking cotton -	$\frac{1}{12}$th or $\frac{1}{10}$th of the quantity picked; generally amounts to $1\frac{1}{2}$ to 2 annas worth of cotton a day.	
11. Picking gram -	1 pendy out of every 20 picked. A man can pick in a day 40 or 50 pendies. The pendy holds $2\frac{1}{2}$ to $3\frac{3}{4}$ seers.	
12. Gathering alsi -	Pendy rate about $3\frac{3}{4}$ seers a day can be thus earned.	
13. Herdsman - -	60 seers a month if a regular servant; occasionally employed men get 4 pices or 1 anna per head of cattle per mensem in the district; at head-quarters much more.	

Narsinghpur, Mr. Bhargo Rao.—Permanent servants engaged all the year round are employed in ploughing, sowing, cutting the crops, watching the fields, and doing all the business which a cultivator would do himself if he had no servant.

Servants employed to watch the fields are often employed for six months, or for two or three months at the lowest at a time, as their services may be required.

Additional labourers employed for cutting the harvest are paid at daily or contract rates.

Additional labourers are also employed in ploughing and sowing. These are not employed for longer periods than a month at the most.

For permanent servants the wages in this district are either paid in grain or in money. Ordinarily the wage is equal to Rs. 2 a month; sometimes the rate varies from 2 to 3 rupees, but these rates are for ordinary years. This year they have risen to Rs. 4 per month, as grain now sells at greatly enhanced rates. When wages are paid in kind the usual rate is 16 maunds of wheat and gram in equal proportion for the year.* In addition to this a permanent servant gets a pair of shoes, one blanket, and at the time of sowing and reaping a small quantity of grain; not more than a rupee's worth altogether is given to him.

Watching of the fields is often given on contract; two or three neighbouring cultivators join together and engage a servant on a salary of Rs. 2 to Rs. 3 per month. When payment is made in kind a labourer gets on an average one seer and a half per day. If they are employed for six months the wages are eight maunds of wheat and gram, besides a blanket and a pair of shoes, and a small quantity of grain at the time of harvest.

Servants employed in ploughing and sowing get from Rs. 3 to Rs. 4 per month, or at a daily rate of $1\frac{1}{2}$ annas to 2 annas. Persons employed at the time of cutting are paid the daily rate above mentioned, or they are paid according to the quantity of work done, *i.e.*, one bundle for every 20 cut by them. Cutting is also given on contract, and this plan is generally preferred.

The labourers, as I have said above, are paid in cash and also in kind. The payment one way or the other is fixed with the consent of the contracting parties.

The labourer generally gets enough to live on, but he is seldom without a family of children, and his earnings are not enough for the family; but his wife and child, if grown up, assist him, and they earn a part of their living. Men who are not employed all the year round by one master need not be idle for the rest of the year; as soon as the ploughing and sowing operations are over, weeding follows; preparations are made for cutting the autumn harvest; then follows watching and cutting of the rabi crops. When cultivators are at leisure, if they have the means, they employ labourers in embanking their fields. It is only in cases where a labourer has a family and small children that he is obliged to borrow, and in such a case his condition is very hard.

Saugor, Mr. Imrie.—Hired field labourers are paid according as their labour is given in the weeding, the grass-cutting, and the harvest season. Ploughing and sowing are done by the members of the family or by house servants, the latter receiving Rs. 2-8-0 or Rs. 3 a month; or in some cases $2\frac{1}{2}$ seers grain a day.

The ploughing and sowing are soon over after the first burst of the rains. The weeding season extends over four months, but only two months' full labour is expended. At that time the hired labourer is paid in kind, except in some villages near Saugor, or one of the larger towns. There the market price of labour,

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* The pulla of Wardha is about equal to three of the ordinary pullas of the Nagpur district.—G. J. N.

† But there is no necessity for his idling during the rest of the year.—G. J. N.

* This amounts to $3\frac{1}{5}$th kandies of wheat and gram, and compares favourably with the 4 kandies of jowari earned by the ploughman in the Nagpur district.

AP.I.QN.15.

CENTRAL ROVINCES.

say, 6 pice a day, is given, but all my informants state that even near Saugor it is rare to pay wages for weeding, save in kind. The amount given varies from ($1\frac{1}{4}$ to $1\frac{7}{8}$ seers) $2\frac{1}{2}$ measures of kodo and kutki being held equivalent to $1\frac{1}{2}$ wheat. Apparently $1\frac{7}{8}$ seers is the general rate, except at a distance from Saugor, where $1\frac{1}{4}$ seer is more commonly given.

Then for cutting grass. This is almost everywhere paid for in money at 1 per 4,000 pulas and at 5,000 when the money is advanced, or in distant tracts 5,000 pulas. In one of the villages payment is made in kind at $2\frac{1}{2}$ seers a 1,000. Grass is cut in December and the months before and after.

Then at the wheat harvest payment is rarely made in money. Payment is almost always in kind, by the armful of crop cut. The usual rate is one pur (armful) for the working day, *i.e.*, from 11 o'clock till evening: or 2 purs from morning till evening. The sheaf-binders get double of this, as their labour requires more skill. Ploughs are driven by members of the family or house servants. In a good harvest year almost double is given, and some Malguzars say they sometimes give treble.* From one pur $1\frac{5}{8}$ seers generally is threshed out; but sometimes $3\frac{3}{4}$ seers of grain.

For the cotton picking the rates are those for weeding; and for the jowari and rice harvests as for the rabi.

House servants get a blanket as the rains set in, and one or two pairs of shoes in the year.

The average hired labourer of the average village finds work in the village for almost the whole year, only between the harvests, when, however, he may be guarding the crop; and in the hot season his labour is dispensed with. And taking the number of labourers' houses in a village as generally equal to that of cultivators, I think a labourer with a small family dependent on him is quite able to subsist on his gains in those intervals. In harvest time he obtains as much grain a day as will last him three, and at other times not much less. Of course, if he has a large family solely dependent on his labour, or any unusual expenses, like a marriage, he must incur debt. And I am told by all I have asked on the subject that not 10 per cent. of the labouring population are out of debt, while very few are in debt over 10. This explains itself. The labourer has no landed interests in the village, neither profits to toil for nor security to give.

But though in debt, I do not imagine that, receiving wages as he does in kind, the cultivator ever curtails his allotment; and while there is work for him, and the grain he gets can feed his family and more, the labourer is safe.

The problem is, however, complicated by the fact that at harvest time only half the labourers employed belong to the village, and of the other half perhaps half do not belong to the district. My information allows me to state generally that in March numbers, amounting to one-fourth of the labourers actually employed, come from the surrounding districts, particularly Tehri, where it is said the insecurity of tenures permits of little outlay on the fields. And as many labourers as come from foreign territory do not belong to the village of which the crops are being reaped, though they belong to other parts of the Saugor district, these therefore share in the harvests of at least two villages.

I am of opinion on the whole that in ordinary years the labourer is able to subsist with fair ease on his payments in the harvest and other seasons. As to those who come from other districts, I know nothing; but I am told that they take back enough grain with them for their own wants.

Many labourers are of course compelled to borrow. If 90 per cent. be in debt, then I presume 90 per cent. have to borrow. But this indebtedness is what they cannot help, and is rarely very deep. It is a condition they tend to; it simply means that they have nothing to spend in luxuries, and that does them little harm. Where there is work, there they have subsistence, which enable them to weather the year with fair ease. If they have children to support and many, the evil cures itself as these grow up."

Seoni, Mr. Wasadeo Bullal Kher.—Hired field labourers are of the following descriptions:—

The Barasiya,—employed by the year. He is required to do any work which the employer may point out to him in respect of cultivation. The whole of his time and skill are at the disposal of the employer. The annual wage varies from 6 to 3 khandis or 2 to 1 seer per day.

The Pakhiar,—employed by the fortnight, must work in the same way as the Barasiya, and may be retained or discharged as each fortnight is completed. The wage is 4 kurus for two weeks, or 2 seers per day.

Harwaha,—ploughman,—is employed for the whole year. But he will only drive the plough, bring in grass for thatching the house, and will fence and hedge the Bari, &c. He will not do anything else. He* receives $\frac{1}{5}$th share of the profits in grain crops, $\frac{1}{32}$nd of gur, half the share of cotton, and this way the individual ploughmen get different shares in different kinds of crop.

Bardia,—Cowherd—grazer of cattle, exclusive of plough bullocks. He takes† 4 kurus per cow=28 seers, 8 kurus per buffalo, 56 seers.

Charwaha—grazer of plough bullocks,—takes $1\frac{1}{2}$ khandis per annum. This man must graze the bullocks without taking them at a distance from the fields to be ploughed. He must take charge of the bullocks as they are disengaged from the yoke in rotation, and bring fresh pairs to the yoke. Generally a boy does this work.

The Banihars,—the day labourer, employed occasionally on work which the standing servants or home labourers could not accomplish, as for instance, in cutting the crops, gleaning, weeding, transplanting rice crops, &c. The daily wage is not less than 2 seers, whether for man or woman.

All these labourers receive their wages in kind. The rate does not vary with the market prices of the grain.

The permanent servant adds to his own wages those of his wife and such of the children as can do field work, so that, unless the unproductive members of his family are not too many, or unless he is kept at home by sickness for some time, he ought, and I believe does, subsist with fair ease on his and his wife's earnings. Any disturbance of these conditions tends to drive him to borrow, and the debt may grow faster than he can manage to pay off. Instances are by no means rare of a cultivator's servants being compelled to steal the grain of his employer, because having already spent his advances of grain, the master will not advance any more.

The day labourers generally remain pretty well occupied for about 5 months of the year; $2\frac{1}{2}$ months in cutting and gathering the crops of both seasons; $\frac{1}{2}$ month in cleaning; 2 months in weeding, transplanting, &c.; total, 5 months.

And as the daily wage of these is 2 seers=to the average requirements in food grains of 3 to 4 souls, it may be assumed that the savings of the working season should suffice for the food requirements of one or two souls; the other necessaries of life, such as clothing, &c., are easily procurable by the proceeds of other labour which is available during the remaining months of the year. Bringing in fuel, grass and other jungle produce to the market for sale or collect-

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* I imagine this can only be when the Bundelkhand labourers are fewer than usual, and when the weather appears to be threatening.—G. J. N.

* No doubt this must be limited to the produce only of such land as the individual ploughman has been employed, or the $\frac{1}{5}$th will be divided among all the ploughmen of the same employer.

† This can hardly be the rate in villages, probably only what is paid at the head-quarter of the district.—G. J. N.

Central Provinces.

ing mhowa for its owner, are the principal kinds of additional work which might be performed during the intervals of field work. In many cases spinning and weaving the roughest country cloth is followed when field labour is slack. On the whole, this last class of hired workmen seem to do well. They often are able to lay by savings, and when they accumulate, can provide the means of starting themselves as independent cultivators. It not unfrequently happens that a broken ryot, when he sees no chance of raising his head above his debts, or can no longer bear the losses of bad years, looks forward to the life of a day labourer or permanent field servant, in order to secure that relief which his improvident management of the land prevented him from achieving. This would prove that the labourers are more successful in their aims than the general run of cultivators.

BERAR.

Berar.

Mr. Dunlop

Lieut.-Col. Menzies.

Akola District.—Women are paid from 1 to 2 annas and men from 2 to 4 annas per diem for weeding, &c. The rate varies according to the demand for field labour. Hindustani labourers are often employed by the year or month at wages of about Rs. 2 per mensem, with their food.

Labour in harvest operations is paid for in kind. For the first picking of cotton $\frac{1}{10}$ is given; for the second picking, $\frac{1}{8}$, and for the third picking about $\frac{1}{2}$.

For harvesting joár a basketful of heads of grain.

Ellichpur.—Women from 1 to 2 annas, men from 2 to 4 annas. Plough with three pairs of bullocks and four men, Rs. 2. Harrow with one pair of bullocks and one man, 12 annas at harvest.

From $\frac{1}{10}$ to $\frac{1}{18}$ part of the first picking of cotton. For the second, third, and fourth pickings the rates are increased respectively to $\frac{1}{8}$, $\frac{1}{6}$, $\frac{1}{2}$ of the quantity of cotton picked.

For collecting ears of joár a quantity of ears equal to eight seers of joár. For collecting ears of wheat half the quantity of seed sown in the whole field on contract, or five bundles per 100 bundles harvested.

Amraoti, Lieut.-Col. Menzies.—Hired field labourers are paid from 1 to 3 annas per diem; the payment is very frequently made in kind. Weeding costs an anna, harrowing 2 annas, ploughing $2\frac{1}{2}$ annas to 3 annas per diem per man employed. Hire of plough bullocks amounts to from 8 to 12 annas per diem.

Wun, Major Szczepanski.—Field labourers are of two classes:—1st. Those employed as servants for looking after the cultivation of the land, and other ordinary field work, and who are generally engaged by the year, and are paid partly in cash and partly in grain, the ordinary wages being Rs. 20 per annum and 24 maunds (864 seers) of grain. 2nd. Those engaged by the day during crop and harvest season for weeding fields and such like work. Both men and women are employed at these times. The wages vary according to the season. Thus at sowing time a man gets 5 annas and a woman 2 annas a day. At weeding season a man gets 3 annas and a woman $1\frac{1}{2}$ annas a day. At present the payment is made in grain. A man getting 9 seers a day is equal to about 8 annas to the man and 4 annas to the woman.

The hired labourer would generally forestall future payments if it were in his power to do so, but having no security to offer, his credit is very limited, and this prevents his running much into debt.

The payments he receives for field work are not sufficient to keep himself and family throughout the whole year, but during the intervals of non-employment he can generally find some other work.

Amraoti, Lieut.-Col. Menzies.—The hired labourer has rather a rough time of it on his small wages, but many of them are men from the North-West and Oudh, and these men positively save. Wages are constantly forestalled, and the labourer at the end of the season finds himself in debt to his employer, and has to bind himself to serve for some time on nominal wages, *plus* his food, to pay off his debt.

Ellichpur, Major Mackenzie.—The hired labourer is not usually able to subsist on the grain or other payments he receives. He does not, however, borrow or forestall future payments, but seeks other employment, or subsists by fuel or grass, which he brings from the forest for sale.

Wun, Major Szczepanski.—The hired labourer is obliged to borrow, as it is rare for him to save anything out of his daily wages.

BOMBAY.

Bombay

Mr. Pei

Kaira.—Hired field labourers get 2 annas a day, besides bread $\frac{1}{2}$ lb. and dhal $\frac{1}{2}$ lb. In the busy season ploughmen get 4 annas, and weavers—men 3 annas, women 2 annas, children $1\frac{1}{2}$ annas, all with one meal a day.*

Wages of labour are—

	Per Day.
Blacksmith	8 annas.
Carpenter	8 „
Sawyer	8 „
Mochi	8 „
Bricklayer	6 „
Tailor	5 „
Weaver	5 „
Mill hands—	
Men	4 „
Women	2 „

The hired field labourer always has to live from hand to mouth in the hot season between employments. He borrows all he can get and forestalls all he can.

Surat.—Field labourers get (in coin), men 3 annas, women $2\frac{1}{2}$ annas. They have no credit to borrow.

Thana.—Field labourers get from 2 to 4 annas a day, or from $2\frac{1}{3}$ to $4\frac{2}{3}$ lbs. of grain. These wages do not suffice to feed the labourer in the slack season; he then borrows.

Colaba.—Field labourers get from 2 to 3 annas in corn. They subsist in the slack time by cutting firewood and odd work.

Khandesh.—Permanent labourers are paid Rs. 40 o 60 a year, with two pairs of shoes and one blanket. They are paid monthly or quarterly, and usually in advance. Temporary hands get, men $2\frac{1}{2}$ to 3 annas a day, women 1 to $1\frac{1}{2}$ annas. Harvest work is paid partly in money and partly in grain, as a rule daily. The labourer is able to subsist in the slack time on what he makes in the busy season.

Poona.—Wages vary. Field labourers sometimes get 2 annas a day and their food. Mhars when threshing get 3 lbs. of grain. Permanent labourers get their food and Rs. 10 to 20 at the Dewali. The wage suffices for a labourer's wants.

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* See for general table, Administration Report of Bombay, Appendix B. (10), Prices of Labour.

AP. I. QN. 15.

BOMBAY.

Mr. Peile.

Kaladgi.—Field labourers are generally paid in kind, 3 Bengal seers per man, 1½ per woman, 1 per boy or girl above 7. For sowing, which is in some sense skilled labour, 4 seers are given. Similarly for reaping 5 or 6 seers, and women 2½ to 3. For harvesting 4 seers and 2. If cash is given, it is the value of the grain at current rates. Cotton picking is paid in kind. In ordinary years the wages earned in busy times carry the labourer over the slack season, and he is fairly well off. The women also make something by spinning.

Canara.—Field labourers get from 3 to 6 annas per diem, generally in kind. A carpenter earns from 6 annas to 1 rupee, blacksmith 8 annas to 1 rupee. The labourers generally borrow in anticipation of the grain they receive at harvest time.

Ratnagiri.—Field labourers are paid, males from 2 to 2½ annas per diem, females about 2 annas. They are paid mostly in kind on the Syhadri slopes, and partly in cash, partly in kind, towards the coast.

As one approaches the coast the rate of wage increases up to 3 annas for males.

Road labourers are paid not less than 3 annas.

Selected road labourers receive from 3 to 4½ annas. Skilled labour, carpenters, blacksmiths, and the like, from 8 to 12 annas.

At the end of May and beginning of June many of the absentees return, and then, notwithstanding the little hoards they may have accumulated, every labouring family on the slopes of the Syhadris is terribly pinched, and lives partly on roots (such as the root of the wild plantain) mixed with coarse grain until the "halway" or early warkas crop is ready.

Throughout the zilla the ryot habitually forestalls his coming harvest by borrowing grain from the khote or grain dealer on the "sawai" system, that is to say, an additional payment of one-fourth the grain borrowed, to be paid back at the next harvest.

MADRAS.

e Board of Revenue.

MADRAS.

In the accompanying statement the rates of wages usually paid in each district for the chief kinds of labour are shown in a tabular form.

Agricultural labourers are as a rule paid in kind, the rates varying in different districts and with the nature of the employment. During the harvest season, when all available hands are employed, the wages are somewhat higher than at other times. A large proportion of the agricultural labourers are permanently in the service of ryots or Mirassidars, and the wages they receive do not represent their entire emoluments. They often receive food in addition to their wages during the cultivation season; house-sites are given rent free; petty perquisites of various kinds are enjoyed; customary presents of cloths, money, &c., are given annually, and on the occasion of important family events advances of money and loans are given, without interest in some cases; and they are allowed the right of gleaning the grain left in the fields and on the threshing floor. It is therefore difficult to estimate precisely the money value of their emoluments, but it may be generally said that their condition is better than the rates of wages given in the statement would indicate, although it must at the same time be admitted that to a great extent they live from hand to mouth, and that they have no means, even by practising the most rigid economy, of accumulating any considerable savings which would enable them to tide over adverse seasons.

In the Wynad coffee plantations money wages are paid to agricultural labourers, but even there a portion of the wages is given in food grain.

The village artizans, such as the carpenter, the blacksmith, the bricklayer, &c., have in many villages maniems, or rent-free lands, or grain allowances, especially the two former, and they are bound to repair the agricultural implements of the ryots free of charge. When they do any other work they receive money wages.

The majority of the collectors who have reported on this question are of opinion that the agricultural labourer is able to subsist with fair ease in all ordinary seasons on the wages he receives for agricultural labour, supplemented by earnings on public works, &c. during the non-cultivation season, and that they are not forced to borrow or forestall future payments for subsistence, although they do so frequently, for marriages and other ceremonies. The collector of Kistna, however, expresses a decided opinion to the contrary. He states: "The permanently hired field labourer, "termed 'paleru,' is nearly always heavily indebted "for advances to his master. He is tied hand and "foot, and his condition is little better than that of a "slave. The daily labourer lives from hand to "mouth, and cannot, if he would, forestall future "payment."

The difference of opinion arises doubtless in great part from the matter being looked at from different points of view. Judged by the standard of mere subsistence, the condition of an agricultural labourer may be said to be one of fair ease in ordinary times, but that it is extremely precarious must be admitted, as adverse seasons are unfortunately by no means uncommon. The wages he receives in an ordinary season are sufficient for his subsistence, and he is not under the necessity of borrowing, unless he desires to meet extraordinary expenses, as for a marriage or other ceremony. High prices do not necessarily affect his condition to any serious extent, as he receives his wages in grain, and is thus ensured sufficient food for mere subsistence, which is all that he has been educated to care for. When, however, prices are high, as a result of failure of crop, and the employer himself becomes embarrassed, the position even of the permanent agricultural servant becomes critical. Having been unable to save anything to stand him in stead in time of need, and there being no demand for service elsewhere, he is thrown entirely on private or public charity for the means of livelihood. The above description applies, however, to the lowest class of landless labourers only, and not to persons who themselves own land and supplement the income from it by working for hire for others; nor to those who own cattle and cultivate the lands of ryots on the "warum," or sharing system, in whose condition there has been of late years a considerable visible improvement.

CHAP. I. QN. 1.

MADRAS.

The Board of Revenue.

STATEMENT showing the RATES of WAGES paid to Agricultural Labourers and Village Artisans in the Districts of the Madras Presidency.

Districts.		Agricultural Labourers.				Smiths.		Carpenters.		Masons.		Remarks.
		Payment in Kind.		Payment in Money.								
		Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	Maximum.	Minimum.	
		Seers of 80 Tolahs.	Seers of 80 Tolahs.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	AS.	
Ganjam		—	—	—	—	—	—	—	—	—	—	Not reported by collector.
Vizagapatam	Villages	2½	2½	2	1	6	2	6	2	6	2	
	Towns	—	—	2	1	6	2	6	2	6	2	
Godavari	Villages	4½	4½	3	2½	4	4	4	4	6	6	
	Towns	—	—	2½	2½	6	6	6	6	6	6	
Kistna	Villages	4¾	4¾	2½	2½	7	7	6	6	4	4	
	Towns	4¾	4¾	2½	2½	8	8	6	6	6	6	
Nellore	Villages	—	—	1	1	12	5	3	3	12	12	
	Towns	—	—	1¼	1¼	8	8	5	5	8	8	
Cuddapah	Villages	2½	2½	1⅓	1⅓	6	6	6	6	4	4	
	Towns	2½	2½	1⅓	1⅓	8	8	8	8	6	6	
Bellary	Villages	3¼	1½	3	1½	8	6	8	6	4	4	
	Towns	—	—	—	—	12	8	12	8	4	4	
Kurnool		4½	2½	2⅔	2	7	5⅓	7	5⅓	7	5⅓	
Chingleput	Villages	2	2	4	2	12	6	12	6	12	6	
	Towns	—	—	—	—	12	6	12	6	12	6	
North Arcot	Villages	1½	1½	½	½	4	4	4	4	4	4	
	Towns	—	—	—	—	8	5	8	5	8	5	
South Arcot		—	—	3	2⅓	6	6	6	6	6	6	
Tanjore	Villages	2¼	¾	3¾	1½	6	6	6	6	6	6	
	Towns	—	—	—	—	12	8	12	8	8	6	
Trichinopoly	Villages	2½	2½	3	3	6	6	6	6	7	6	
	Towns	—	—	—	—	8	8	8	8	8	8	
Madura	Villages	—	—	4	2½	6	4	6	4	12	6	
	Towns	—	—	—	—	12	6	8	6	12	6	
Tinnevelly	Villages	—	—	4	2	6	3	6	4	—	—	
	Towns	—	—	6	2	8	4	9	4½	—	—	
Coimbatore	Villages	2¾	¾	4	1	6	4	8	4	8	4	
	Towns	—	—	—	—	8	6	12	8	12	8	
Nilgiri		—	—	—	—	16	16	14	14	14	14	
Salem	Villages	9	1¾	8	¾	—	—	—	—	—	—	The collector gives the rates per plough.
	Towns	9	1¾	12	¾	—	—	—	—	—	—	
South Canara	Villages	1½	1½	2½	2½	6	6	6	6	6	6	
	Towns	1½	1½	2½	2½	8	8	8	8	8	8	
Malabar		1½	¾	2¾	1½	7	4	10	6	7	4	Wages are given in rice.
Madras		—	—	3	2⅔	8	6	8	6	6	4	

MYSORE.

MYSORE.

Mr. Krishnienyar.

The wages paid in the Kolar district to *jitagars* or farm servants permanently employed are partly in money and partly in raw food grain or cooked food, and they vary from Rs. 3 to 7 in cash and from 3½ kandies or 1,120 lbs. to 4½ kandies or 1,440 lbs. of food grain per annum or two meals a day if cooked food is given. The chief duties of these servants are to cultivate lands, watch and stack the crop, and attend to cattle. The labourers employed temporarily for weeding, transplanting, reaping, &c., get daily wages as given below:—

	If in Grain.		If in Cash.			
	From.	To.	From.		To.	
	Lbs.	Lbs.	As.	P.	As.	P.
Males	4	8	1	6	2	0
Females and children	4	6	1	0	1	4

The earnings of these labourers, when employed on fields are not sufficient for their subsistence at other periods, but they get ample employment during those periods on tanks and roads which must necessarily be maintained for them to be used.

CENTRAL INDIA.

CENTRAL INDIA.

Mr. Wingate

Wages of labour are invariably paid in kind, except in or near large towns. In this latter case Lieutenant-Colonel Bannerman thinks the cash wage is about Rs. 3 per mensem.

In *Bhopal* wages ordinarily are 2 seers of grain a day, except in harvest, when one-twentieth of the produce is given to the reapers and the right of gleaning.

In *Baghelkhand* field labourers get 2½ seers of "kodu" per diem, or when kodu is not available, 1½ seers of better grain; but ploughmen get 25 per cent. more than ordinary labourers.

In *W. Malwa* ordinary wages are 2 seers of joár, per diem, or, if in money, 1½ to 1¾ annas. For reaping 4 to 5 seers of the crop are given, or 1½ to 2 annas in money.

For *Manpur*, Pundit Suroop Narain writes:—

" Of field labourers those that are employed in ploughing get 2 to 2½ annas daily. Those employed in weeding get 1½ to 2 annas, the payment in both cases being in cash. The watchman of a field receives

IAP. I.QN.15.

CENTRAL INDIA.

Ir. Wingate.

5 seers of grain for each bigha of kharif and 5 to 7 seers per bigha for rabi crops. Labourers engaged in ploughing, &c. for a whole season get. 9 maunds of grain, a pair of shoes, and a blanket, with $1\frac{1}{4}$ seers of grain daily during the time the sowings are going on. The season in the above arrangement comprises a period of six months. Cash payment for the same work is made at the rate of $4\frac{1}{2}$ to 5 Rs. monthly. The rate of daily wage for wounding the poppy pods and for extracting the juice therefrom is, if paid in advance, $1\frac{1}{2}$ annas, and if paid at the time of work, 2 annas daily. The labourers so employed have the additional privilege of getting all the juice which may happen to run off and deposit itself on the leaves or stems of the plant. All field labourers employed by the day are at liberty to work for additional gains when off their work in the field. It is by these additional earnings that field labourers manage to make both ends of their accounts meet, and in some cases they are obliged to have recourse to borrowing or forestalling their future earnings."

IYDERABAD.

'oulvie Mahdi Ali.

HYDERABAD.

Wages vary in different districts. In the Maratha country field labourers employed throughout the year are paid from about Rs. 2-8 to Rs. 4 per month, without food being supplied to them. When food is given they are paid at the rate of about Rs. 18 per year, and they get besides annually a country blanket and a pair of shoes. A field labourer employed at harvest time generally gets from 5 to 7 per cent. of the sheaves he is able to cut and gather in a day; this may come to about $2\frac{1}{2}$ seers of grain, besides the straw. If money payments are made, a labourer gets two annas, a woman one anna, and a boy one anna per diem. Money payments are generally made when labourers are employed in weeding, &c. In Bidar and Gulbarga money payments are rare; the labourers receiving grain equivalent to the value of their wages. In the Aurangabad district (*vide* Notes on the Agriculturists, by Mr. Furdoonjee Jamsetjee), when the labourer is employed by the year, he generally receives from Rs. 12 to Rs. 30 per annum with food, or from Rs. 45 to Rs. 55 without food. In the former case he is also supplied with the following five articles of dress every year:—

		Rs.	
1 Kambli (blanket), value about	-	1	8
1 Dhoti ,,	-	1	0
1 Pair shoes ,,	-	1	0
1 Turban ,,	-	1	0
1 Waist-cloth ,,	-	0	8
Total -	-	5	0

A written agreement is generally entered into by which the labourer binds himself not to leave the service until the expiry of the term of his contract. It may be mentioned here that the labourer has generally to serve 13 months, though he is only paid for a year. The agreement is generally entered into during the months of *Chaitra* and *Vaisak*, when a part of the yearly wages is paid in advance, and the labourer draws the balance in small sums, as he may require, from time to time.

When food is given it consists of four cakes (about 2 lbs.) per day and some vegetables, or *dal*, with *chatni* or onions.

When a labourer is employed by the month a written agreement is seldom entered into, but the labourer engages to give a month's notice before leaving the service. Labourers of this class are seldom employed all the year round, but are only taken on during busy seasons. They do not generally receive food, but are paid a monthly salary, varying from Rs. 4 to Rs. 6, and have to find their own food and clothes. When the labourer receives an advance, he repays it by monthly stoppages out of his salary. When working in the fields his meals are brought to him by one of the women of his family.

Excepting when employed in harvest work, the labourer, ween engaged by the day, is generally paid in cash. He receives from two to three annas per diem, and in very busy seasons, when labour is scarce, he sometimes receives as much as four annas (6*d*.). A woman obtains from one to one and a half anna, and sometimes two annas per day. A boy has about an anna a day. Labourers engaged on daily wages are generally employed on the following work:—

Weeding.—Cash payments are generally made for this kind of work.

Harvesting.—The labourer receives five sheaves for every 100 of the crop he gathers. If it be a jowari or bajri crop, a woman is able to reap from 50 to 75 sheaves per day, and a man 100. Gram, *tur*, &c. is tied in large bundles, called *kadaps*, which vary in size, and of these also the labourer receives five per cent. When scarcity prevails and prices of grain are high, the labourers are not paid in grain, but in coin.

Cotton and ground-nut picking.—The labourer receives about $\frac{1}{14}$, $\frac{1}{16}$, or $\frac{1}{18}$ of the quantity picked in a day. During the first picking the share paid to the labourer is not so large as during the second and third pickings.

Threshing.—For separating the heads of 100 sheaves of bajri and jowari from the stalks, the labourer receives two seers of the heads of corn.

Ginning Cotton.—This labour is generally paid for in cash by marwadis, who purchase the crop, at so much for every seer of cotton ginned. The cultivator, however, gives the labourer the cotton seed in payment of the labour for ginning.

In the Telingana country labourers employed throughout the year are paid at the rate of Rs. 3 per mensem. At the *tabi* harvest each labourer gets besides a rupee worth of grain, and two rupees' worth at the *abi* harvest. Labourers who are employed throughout the year, and who are paid in kind, receive one seer of grain per diem, and at the time of the *abi* harvest they receive four maunds of grain, and at the *tabi* three maunds. Labourers employed temporarily for weeding, &c. receive three seers each of paddy per day, or one seer and a half of rice or jowari. If they are paid in coin, a man or woman receives two annas per diem, but money payments are rare. In some talukas of the Telingana country a maund and a half of grain per month is allowed to labourers employed throughout the year, and at the time of harvest they receive besides three maunds of grain and Rs. 3 in cash.

CHAPTER I.—QUESTION 16.

CHAP. I. QN. 16.

What is the normal rate of prices of each of the chief staples of food in certain typical districts? What is the usual variation between the prices at harvest time and other times of the year? What rise in price would indicate the approach of alarming scarcity? In past times of severe scarcity what effect has been produced on prices; has the rise been sudden or gradual, and has it affected one staple more than another? Or has the rise been of such a character as to tend to equalise the prices of all staples

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PUNJAB.

PUNJAB.

Major Wace.

Prices of Food.—I take as the chief staples of food—*wheat, barley, bájra,* and *joár.* Of the total average area of annual cultivation, 211 lakhs of acres,

Wheat occupies	-	63½ lakhs.
Barley	-	17 ,,
Joár	-	22¼ ,,
Bájra	-	29 ,,

which together aggregate 63 per cent., or nearly two-thirds of the whole. And if the estimate of the food consumed in each district be compared with the statement of crops annually cultivated (both of which papers are appended to the reply to Question 3 of Chapter I.) it will be seen that there are good grounds for stating that these four cereals contribute three-fourths of the food of the population.

There is a material difficulty in stating the normal price of these staples. The truth is that there is nothing of which the value is so unsettled. To illustrate this I append two diagrams showing the prices of these and other principal articles of agricultural produce from the year 1841 to date. The prices shown therein were obtained by striking an average on the prices which annually prevailed in each district. The diagrams will show conclusively that, in the sense of prices which have usually obtained with a fair amount of steadiness over a series of years, no normal prices can be stated. To understand the existing state of prices it is necessary to consider the history of the country for the past 40 years. Up to the year 1847 the country had no roads, and little or no external trade; such trade as existed was burdened with customs and transit dues at every town, and cultivation was in a most depressed state. From the year 1849 all these conditions began to alter; roads were rapidly made throughout the country; trade was freed of all duties; the charges on the land were greatly reduced; and cultivation extended rapidly. The first result of these changes was greatly to cheapen the price of food grains. They were not acting alone, but in combination with a great number of other political and economical changes brought in with British annexation. To explain this I take the following extract from the Punjab Administration Report for the three years ending 1855–56 (para. 45.):—

"The sudden pacification of the Province after annexation, the cessation of military and political employment, which occupied many thousand of persons, and caused money to circulate in the villages induced large numbers to devote themselves to agriculture. Formerly a proportion of the agricultural classes were engaged in war and service of various kinds, and thus they supported themselves and contributed to the support of those who tilled the ground at home. But now the entire support of all these classes fell upon the land. Again, there came a cycle of seasons more favourable than the average of years under British rule. From all these causes the agriculture became unusually productive, flooded the markets with produce, and reduced prices nearly 50 per cent. This cheapness rendered it difficult for the agriculturists to obtain cash for their produce, when they wanted it to pay their new money assessments. There was less money in the Punjab than previously; large sums, which would formerly have circulated in the Punjab were remitted to other parts of the Empire by the soldiery and other Government employés. Again, the fact that nothing but cash was accepted in payment of the Government revenue, enhanced the value of money. The agriculturist, therefore, with abundance of surplus produce on his hands found difficulty in converting it into money, and this difficulty was perhaps aggravated by the unvarying nature of the Government demand (however low) with men accustomed to an annually fluctuating demand under Sikh rule."

Looking back on those years, we may perhaps not incorrectly summarise the facts of the time by saying that agriculture expanded with leaps and bounds, whereas there was no corresponding increase in other industries and in trade. And even if we could by any means have avoided levying our revenue in cash (which we certainly could not have avoided), the result on the price of agricultural produce might have been the same.

The report from which the above extract is quoted states that for 10 years preceding 1850 the price of wheat averaged 20 sers the rupee; the diagrams appended to this reply indicate a cheaper rate, perhaps 27 sers. But in 1851, owing to the causes above sketched, wheat had fallen to 42 sers; and from that time to 1859, 40 sers per rupee remained the usual value of wheat. After the famine of 1860–61, wheat in the year 1863 averaged 31 sers per rupee, joár 42 sers and barley 49 sers. But prices thenceforward rose steadily. Of this the explanation, I believe, is, that during the famine of 1860–61 the grain stocks of the Punjab, previously very full, were reduced very low by exportation towards Delhi and the Provinces to the east. The subsequent seasons were not very good; and there was a steady export toward Sind, owing to bad seasons there. The culminating point was reached in the famine of 1868–69; and prices falling immediately afterwards, continued to do so steadily, till again raised by the panic consequent on the failure of the autumn rains of 1877. They have since fallen, but as yet not to the level obtaining before the panic set in.

In the interval between the cessation of the famine of 1860–61, and the commencement of that of 1868–69, wheat after falling in 1863 to an average price of 31 sers, rose steadily; till in 1867, the year before the next famine, it averaged 22 sers. Similarly the average price of barley was 49 sers in 1863, and rose steadily to an average of 31 sers in 1867, joár in the same period rose steadily from 42 to 29 sers the rupee.

In order to examine more exactly the course of prices since the effects of the famine of 1868–69 passed off, I have compiled a statement, which will be found in the papers appended, showing for 10 districts in different parts of the Province the prices which have prevailed from April 1873 to date. These years up to the autumn of 1877 were prosperous years; and include at their commencement both the drain caused by the Bengal famine of 1873–74, and at their close that caused by the usual export trade of wheat to Europe and by the famine of 1876–77 in Southern India.

HAP.I. QN.16.

PUNJAB.

Major Wace

Taking the four years commencing April 1873 and ending March 1877, the return indicates the following as the normal price of the principal food grains for those years:—

——	Delhi.	Mooltan.	Amritsar.	Dera Ismail Khan.
Wheat - -	23	19	25	28
Barley - -	31	27	35	42
Bájra - -	25	24	26	40
Joár - -	27	25	32	43

The Mooltan prices are highest owing to the proximity of that city to Sind, and to the river export trade with that Province. The prices at Delhi, on the border of the N.-W. Provinces, though lower than those of Moolton, are higher than those prevailing at Amritsar in the centre of the Punjab. Dera Ismail Khan is an instance of a retired rural district in the west of the Province; its distance from the Sind markets exceeds that of Mooltan by barely 153 miles, and this seems scarcely adequate to maintain permanently so great a difference in prices, as the above table exhibits.

It is extremely difficult to say whether the prices of the next five years will approximate to those of the years 1873–76.

The Bengal famine of 1873–74, the famine in Southern India of 1877, and the rising export trade of wheat from the Presidency Ports to Europe, have all drawn largely on the food grains of the Province. The railway connexion of the Province is complete with Calcutta and Bombay, and now finally with Karrachi. The cost of conveying a maund of wheat by rail to Calcutta is about Rs. 1 8 0, and to Bombay Rs. 1 12 0. The distance from Amritsar to Karrachi may be roughly stated at half that from Amritsar to Calcutta. Wheat is cheap in Bombay at 12 sers, and in Karrachi at 14 sers. These are items of trade which will be in the future very closely watched by the traders of Upper India. But unless we assume as probable a very rapid growth of the wheat trade with Europe there would appear to be no very strong reason why the prices of the years 1873 to 1876 should not shortly repeat themselves.

The prices of this period correspond fairly with those indicated in the diagram appended for the period 1863 to 1867, which I have above stated, and it seems highly improbable that we shall ever return to the cheap prices which prevailed in the 10 years ending 1859; when we had no railway system, no practicable trade connexion with Eastern and Southern India, and no export of grain to Europe.

The prices of barley, bájra, and joár (though usually for barley 8 or 10 sers and for bájra and joár 5 sers cheaper than wheat) will always vary with the price of wheat. The diet of the people is not confined to one description of grain; therefore a rise in the price of one is certain to create a proportionately increased demand for the others, and so it is not possible that an excessive demand for, or failure in supply of, one grain should arise without the price of all the principal food grains being similarly affected.

I hope I have shown good grounds for my statement that there is nothing so little settled in the Punjab as the price of food grains. It has been continually changing for the past 30 years. And it is only now after the completion of railway connexion with the rest of India that we can hope to be approaching more settled prices. But this again depends on the future of India's export trade. All that is really certain is, that such extreme depressions of the value of food grains as took place after annexation are improbable in the future.

The return of prices appended does not bear out the apparent assumption that prices at harvest time will usually be cheaper than at sowing time. Other things being equal, undoubtedly prices rise at sowing time and fall at harvest time, and the farther a district is removed from the main centres and channels of trade in the Province the more these seasons will affect prices. But the state of trade and the character of the harvest are much more powerful influences. If a poor harvest succeeds a year of plenty, or if a sudden drain by export arises between sowing time and harvest, the harvest prices will be as dear or often dearer than those of the sowing season; and conversely if the harvest is plentiful, and the export demand small, the harvest prices will be lower. If the return of prices appended be examined, it well be seen that it is by no means the rule that prices are cheaper at harvest time than at sowing time.

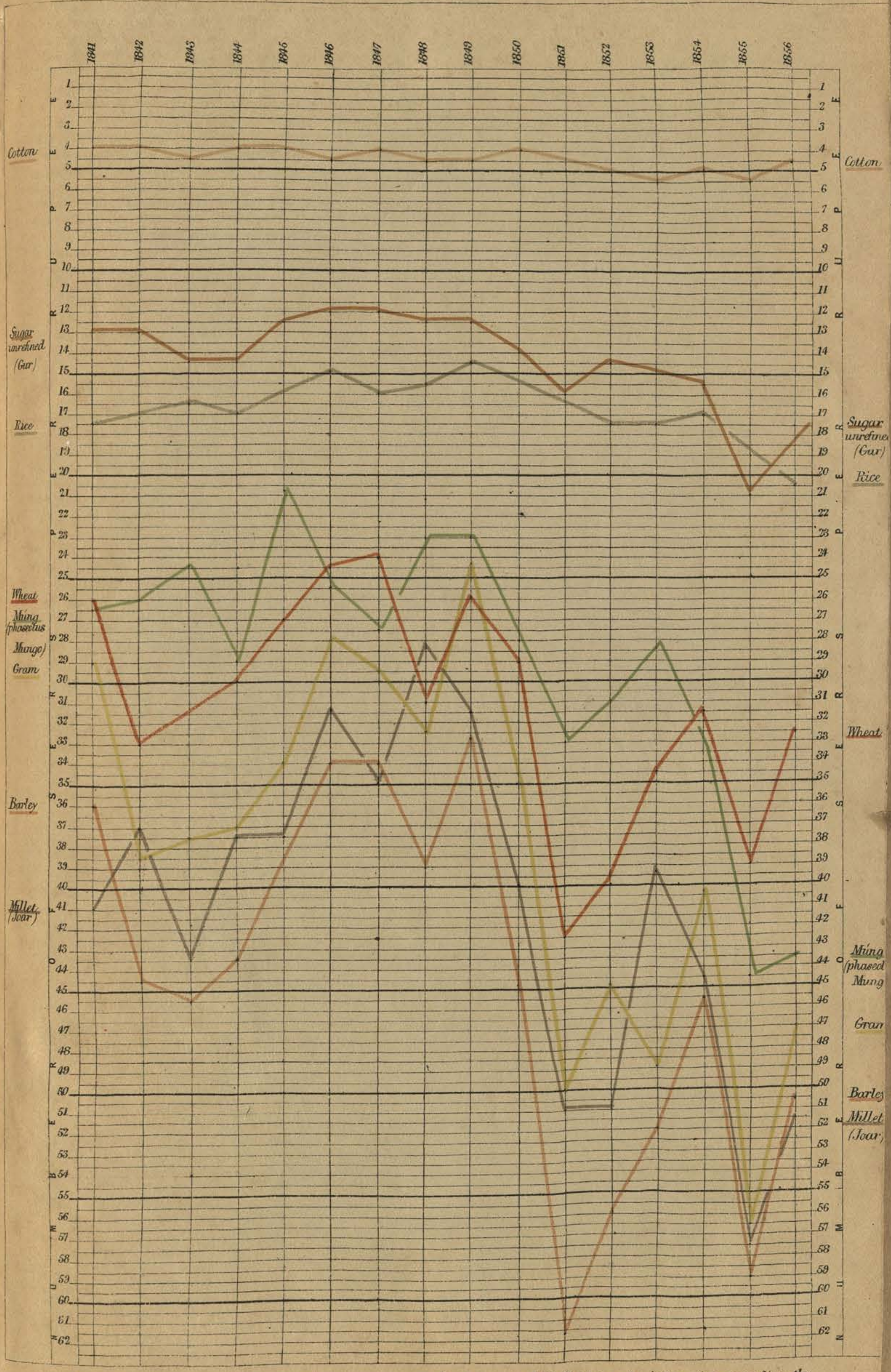
If the Punjab during the past 20 years had been free of the disturbing influences of scarcity and of new developments of export trade, it would have been possible to frame an answer to this question. But on a full consideration of the history of prices during this period as described above, I see no way of framing a reply, which would not be merely a questionable generalization. There is no district which can be said to be outside the influences of external trade.

The reply to Question 2 contains all the data needed to meet the inquiry as to the relation between prices and the approach of alarming scarcity. When scarcity is threatened, all prices rise equally in value for the reason stated a few lines above. The rises which precede periods of scarcity are usually sudden, being commonly caused by the failure of the autumn rains; a failure which in the present state of the people's knowledge it is not possible for them to foresee. In the nature of the case the rise in prices will take effect during the two months following the kharif sowing time, and will become aggravated when it is clear that not only the kharif harvest but also the rabi sowing have been lost. I am not able to quote the monthly prices of the years 1860–61 and 1868-69, but in the following table I give the extent of rise which took place in the two months of August and September 1877:—

——	Prices at Delhi.		Prices at Amritsar.	
	End of July.	End of Sept.	End of July.	End of Sept.
Wheat - -	21	12	27	14
Barley -	33	17	46	18
Joár - -	24	15	32	19
Bájra - -	21	13	25	16

When wheat rises suddenly in this way to 12 or 14 sers the rupee, and the other staples rise in price at the same time, and in the same degree, it is certain that severe scarcity is impending. Such scarcity may not follow; for instance, it did not last year; but everything depended on the rabi sowings, and at the last moment timely rain secured them. If those rains had not fallen, we should certainly have seen wheat selling by December at from 8 to 10 sers the rupee over the greater part of the Province.

DIAGRAM SHOWING THE RISE AND FALL IN PRICES OF PRINCIPAL ARTICLES OF AGRICULTURAL PRODUCE IN THE PUNJAB, FROM 1841 TO 1856.



NOTE. The prices shown in this Diagram are calculated on the averages of 16 Districts only, information regarding the remainder not being available for the years in question.

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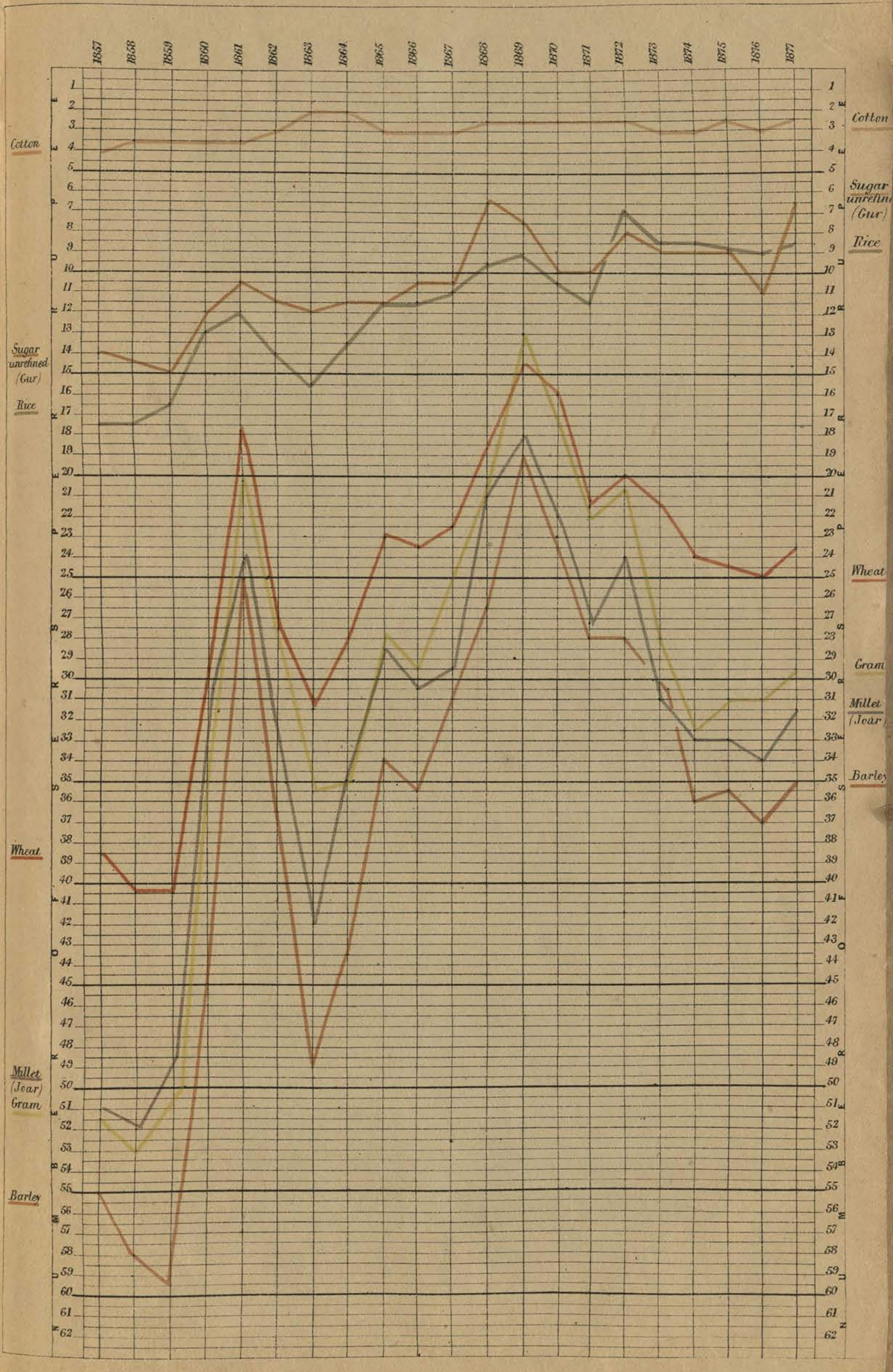
DIAGRAM SHOWING THE RISE AND FALL IN PRICES OF PRINCIPAL ARTICLES OF AGRICULTURAL PRODUCE IN THE PUNJAB, FROM 1857 TO 1877.



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VARIATION OF PRICES BETWEEN HARVEST TIME AND OTHER TIMES OF THE YEAR.

STATEMENT SHOWING MONTHLY VARIATIONS in the RETAIL PRICES of FOOD in selected Districts of the PUNJAB from April 1873 to September 1878.

Month. (The price quoted is that with which the month ended.)	From April 1873 to March 1874.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	21	24	21	24	27	22	21	20	22	18
May	20	22	23	28	23	22	22	22	25	19
June	18	20	20	26	25	20	24	22	26	21
July	19	19	19	23	23	20	23	22	25	20
August	17	19	18	23	24	18	22	22	27	18
September	17	16	20	23	24	19	17	18	21	17
October	18	18	20	24	25	19	18	19	21	18
November	18	20	20	23	23	19	18	15	22	18
December	17	20	21	22	22	19	18	15	22	17
January	17	20	20	21	23	20	18	15	22	17
February	17	19	20	23	21	18	20	15	25	16
March	18	19	20	23	21	17	17	17	25	17
—	Barley.									
April	34	43	31	40	39	40	37	28	38	35
May	29	38	30	40	39	37	34	28	38	40
June	22	33	26	32	35	32	36	28	39	43
July	25	31	25	30	34	32	35	28	37	40
August	23	32	24	30	34	30	31	27	37	38
September	24	25	24	29	35	29	27	26	34	35
October	24	28	24	28	35	30	27	24	30	34
November	23	28	28	34	33	30	27	22	31	32
December	23	33	29	32	29	32	27	21	34	32
January	22	33	27	30	31	33	27	24	35	32
February	23	32	26	32	30	33	30	25	36	29
March	25	32	30	30	31	32	29	27	37	28
—	Bájra.									
April	23	35	27	28	29	24	30	24	39	23
May	22	33	25	28	28	21	31	24	36	23
June	30	29	22	24	28	21	33	21	36	23
July	20	28	21	24	25	20	31	22	36	21
August	20	24	18	22	30	16	25	23	30	21
September	20	21	24	23	29	19	24	22	28	21
October	22	24	24	25	29	21	25	21	33	23
November	21	22	23	30	28	19	22	22	37	22
December	21	24	21	24	26	19	22	21	37	23
January	21	24	21	22	26	19	22	20	34	25
February	20	24	25	22	25	19	24	21	35	29
March	18	24	25	20	28	20	22	23	37	29

Month. (The price quoted is that with which the month ended.)	From April 1874 to March 1875.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	19	19	22	21	21	18	19	15	25	15
May	20	21	24	26	26	24	25	18	27	22
June	20	19	23	26	26	25	—	18	27	23
July	20	19	23	25	25	21	26	18	25	24
August	21	19	22	25	24	21	27	18	26	23
September	21	20	26	29	27	24	27	19	26	24
October	22	23	27	29	27	24	30	18	26	23
November	23	21	26	30	—	24	30	19	29	24
December	22	23	28	28	26	24	29	20	30	24
January	22	23	24	24	25	22	29	20	32	20
February	20	22	23	26	25	23	29	20	34	22
March	23	21	25	27	28	25	30	21	34	24
—	Barley.									
April	27	33	30	38	32	34	38	27	40	29
May	27	31	30	34	35	40	39	28	38	36
June	27	26	30	34	35	39	—	26	40	42
July	28	27	30	36	36	41	40	28	40	42
August	28	27	30	36	35	41	44	29	40	42
September	31	29	30	48	38	43	46	30	40	41
October	31	32	32	45	43	42	50	29	40	40
November	34	32	32	50	—	43	50	30	43	40
December	31	34	36	50	37	40	51	29	45	42
January	31	34	32	40	35	35	50	29	50	27
February	29	30	30	40	34	36	45	28	51	34
March	33	30	32	48	36	42	53	37	63	36
—	Bájra.									
April	19	27	20	20	24	19	22	23	37	21
May	18	24	20	16	17	18	22	20	40	24
June	17	23	13	16	20	18	—	20	40	26
July	19	23	16	16	21	20	21	17	38	27
August	19	25	16	16	17	16	30	12	38	29
September	24	26	16	20	29	20	30	12	40	29
October	26	25	16	28	31	37	40	24	39	31
November	26	26	25	30	—	32	40	24	41	34
December	26	27	25	26	22	30	40	24	40	33
January	26	26	28	24	24	28	40	28	44	26
February	26	23	26	22	28	30	36	28	44	30
March	27	23	25	22	28	28	36	31	53	35

Month. (The price quoted is that with which the month ended.)	From April 1875 to March 1876.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	24	21	25	26	26	25	31	22	40	24
May	24	23	26	26	26	23	31	21	43	26
June	22	21	25	26	25	25	30	20	38	27
July	21	20	22	25	25	23	29	19	31	26
August	20	19	22	25	24	22	25	19	29	25
September	22	23	25	24	—	22	24	—	30	23
October	22	23	25	22	22	23	25	18	31	22
November	24	23	24	22	22	22	25	18	31	22
December	24	23	24	21	21	23	26	18	33	21
January	23	23	22	20	20	22	27	19	36	21
February	24	19	—	19	20	22	27	18	34	21
March	25	19	20	22	22	22	27	18	33	21
—	Barley.									
April	34	32	33	48	38	40	53	32	63	40
May	32	30	33	40	40	40	42	31	53	40
June	29	28	35	42	37	37	43	29	53	40
July	27	24	32	40	36	38	40	26	50	38
August	28	30	32	40	34	35	38	25	45	35
September	30	34	32	36	—	35	35	—	39	35
October	31	30	34	30	30	39	34	22	41	34
November	31	32	34	34	32	37	34	25	40	35
December	33	36	34	34	31	38	36	26	46	33
January	33	50	29	36	31	32	36	27	50	30
February	34	40	—	36	32	34	38	27	45	27
March	35	40	31	36	40	36	40	26	43	27
—	Bájra.									
April	28	26	24	22	27	27	40	31	55	34
May	26	26	20	20	27	20	40	30	56	33
June	25	23	25	20	27	19	40	29	58	35
July	24	23	20	20	27	20	37	27	50	36
August	24	25	16	20	24	20	34	27	43	35
September	24	32	16	20	27	23	34	—	38	31
October	25	33	20	22	24	35	30	25	41	31
November	25	36	33	30	26	30	31	24	43	34
December	28	35	32	28	32	28	32	24	40	32
January	28	35	28	24	33	28	32	25	44	30
February	32	35	—	30	30	28	33	25	40	31
March	32	37	32	29	30	28	33	24	43	31

Month. (The price quoted is that with which the month ended.)	From April 1876 to March 1877.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	25	25	22	23	28	21	28	19	34	23
May	28	24	25	25	26	25	31	20	34	27
June	25	23	25	26	25	25	31	19	34	29
July	26	23	24	25	25	25	31	21	33	28
August	27	22	24	25	25	26	31	21	31	25
September	27	21	24	26	26	26	32	20	33	25
October	27	22	24	27	28	25	30	—	32	25
November	27	23	—	28	29	26	31	—	34	—
December	27	24	—	27	—	28	33	23	34	—
January	28	24	26	27	29	28	32	24	35	27
February	20	26	27	27	30	30	32	23	35	—
March	25	25	27	29	34	34	32	24	36	30
—	Barley.									
April	38	49	35	39	33	45	48	27	44	35
May	38	45	35	42	36	43	42	26	41	50
June	38	42	38	42	37	43	42	27	40	50
July	36	40	36	40	36	48	42	29	40	46
August	39	40	35	41	36	49	43	29	38	41
September	37	47	36	38	36	50	42	30	39	40
October	37	45	34	32	42	49	42	—	43	44
November	36	47	—	32	48	50	42	—	45	—
December	37	46	—	34	—	55	42	31	44	—
January	37	50	40	36	55	52	42	—	50	47
February	37	50	—	36	53	52	42	34	45	—
March	40	50	41	40	53	60	42	34	41	59
—	Bájra.									
April	34	37	28	28	29	28	33	24	45	26
May	31	37	22	28	23	28	33	24	48	—
June	27	36	22	26	26	28	33	22	45	29
July	29	34	21	24	20	16	34	18	44	25
August	29	34	20	24	23	30	32	24	44	27
September	29	41	20	22	23	32	36	24	43	21
October	30	40	26	26	23	36	49	—	40	21
November	32	38	—	28	23	26	36	—	38	—
December	33	39	—	26	—	30	37	25	38	—
January	35	40	32	32	29	30	40	—	50	30
February	35	41	—	32	27	40	40	28	43	—
March	32	41	24	27	24	40	40	34	41	31

Month. (The price quoted is that with which the month ended.)	From April 1877 to March 1878.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	23	25	27	29	28	31	32	22	33	32
May	24	24	25	—	29	26	32	18	31	31
June	24	25	28	27	30	25	32	19	32	33
July	21	22	25	25	27	23	34	18	31	29
August	17	17	20	17	18	15	24	16	25	23
September	12	11	13	15	14	13	14	15	21	21
October	—	12	13	16	17	15	18	15	21	—
November	15	13	16	17	16	16	18	15	21	20
December	14	14	15	16	15	15	20	14	19	19
January	13	14	15	16	14	13	16	12	17	15
February	14	13	14	14	14	14	16	12	16	15
March	16	13	15	18	19	15	20	14	18	16
—	Barley.									
April	41	48	42	56	50	60	44	34	48	66
May	37	44	42	—	50	50	—	35	48	59
June	39	46	50	50	54	50	44	34	48	59
July	33	37	37	38	46	40	45	32	45	65
August	22	25	25	20	24	24	33	28	38	44
September	14	15	17	19	18	18	22	28	34	39
October	—	17	16	18	23	20	23	23	30	—
November	17	19	17	19	20	19	22	25	28	38
December	17	21	18	16	18	16	20	24	28	40
January	17	20	17	13	17	16	18	19	21	31
February	17	20	17	16	19	16	18	17	21	33
March	21	21	18	20	27	23	20	23	20	36
—	Bájra.									
April	28	38	22	30	23	32	40	30	44	34
May	25	37	25	—	25	30	—	32	41	36
June	25	38	22	30	25	26	38	30	41	36
July	21	30	20	28	25	25	39	22	35	36
August	18	22	16	20	20	16	26	18	28	33
September	13	13	11	18	16	13	18	18	25	25
October	—	14	12	18	16	15	19	19	20	—
November	15	15	12	19	16	15	20	20	20	22
December	15	18	13	19	14	14	21	16	20	13
January	12	17	12	16	14	14	18	14	19	19
February	15	18	13	13	14	13	18	13	18	15
March	16	17	12	16	14	12	19	12	18	16

Month. (The price quoted is that with which the month ended.)	From April 1878 to Sept. 1878.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Peshawar.
	Wheat.									
April	15	13	18	19	18	16	22	14	17	15
May	16	13	18	18	19	17	18	13	18	17
June	15	13	18	18	18	16	18	13	18	19
July	15	14	18	18	18	17	18	13	16	18
August	16	17	19	18	18	17	17	12	15	15
September	17	16	22	20	20	18	18	12	16	—
October	—	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—	—	—	—
January	—	—	—	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—	—
—	Barley.									
April	22	21	27	25	35	30	30	23	20	34
May	21	21	26	24	27	31	25	20	21	35
June	19	20	25	22	24	27	25	18	23	31
July	19	22	24	24	27	32	27	19	21	29
August	21	32	24	21	27	32	27	18	21	27
September	23	32	30	25	32	36	27	19	25	—
October	—	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—	—	—	—
January	—	—	—	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—	—
—	Bájra.									
April	16	18	12	18	16	12	19	13	15	16
May	13	16	10	12	16	9	16	11	15	8
June	13	14	8	12	16	9	14	7	15	14
July	11	18	7	11	16	8	12	6	15	13
August	19	24	10	10	16	10	14	—	15	14
September	21	30	20	16	18	10	17	16	18	22
October	—	—	—	—	—	—	—	—	—	—
November	—	—	—	—	—	—	—	—	—	—
December	—	—	—	—	—	—	—	—	—	—
January	—	—	—	—	—	—	—	—	—	—
February	—	—	—	—	—	—	—	—	—	—
March	—	—	—	—	—	—	—	—	—	—

HAP. I. Qn. 16.

PUNJAB.

Major Wace.

STATEMENT SHOWING MONTHLY VARIATIONS, &c.—*continued.*

MONTH. (The price quoted is that with which the month ended.)	From April 1873 to March 1874.									
	Jowár.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
April - - -	33	40	30	31	32	25	24	25	43	26
May - - -	26	38	27	35	30	23	25	25	42	26
June - - -	23	31	24	32	28	23	26	24	41	22
July - - -	21	27	22	24	26	22	25	23	41	26
August - -	21	31	23	27	32	22	25	23	34	23
September - -	21	24	24	27	33	22	22	24	32	23
October - -	24	28	25	29	35	26	28	22	36	24
November - -	21	30	26	34	37	28	30	22	40	29
December - -	25	30	29	31	33	28	28	23	40	27
January - -	21	29	27	26	32	28	28	21	38	27
February - -	23	26	28	29	32	24	30	21	37	23
March - -	24	28	30	30	30	24	29	22	39	23

MONTH.	From April 1874 to March 1875.									
	Jowár.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
April	25	30	30	28	27	21	25	20	37	21
May	24	22	26	30	21	18	25	22	42	23
June	28	24	18	30	21	20	—	23	42	26
July	26	25	16	30	32	20	24	24	38	35
August	26	24	20	30	32	20	24	25	38	27
September	26	28	26	40	36	30	28	28	40	27
October	26	25	30	40	33	30	40	26	39	31
November	27	28	30	42	—	32	40	26	45	33
December	26	32	35	41	35	30	40	26	45	30
January	26	31	33	35	34	29	40	28	50	22
February	26	29	29	35	31	30	36	27	50	27
March	25	32	29	42	38	30	36	28	55	29

MONTH.	From April 1875 to March 1876.									
	Jowár.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujráwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
April	25	29	27	42	38	30	40	26	63	34
May	25	28	25	36	29	26	40	26	73	30
June	23	22	28	36	38	26	40	26	70	34
July	22	20	29	36	37	26	34	27	53	29
August	26	27	29	36	25	30	32	29	50	27
September	26	34	29	32	—	30	32	—	43	29
October	29	34	32	30	25	38	40	26	43	33
November	30	40	34	32	28	32	38	25	45	32
December	30	42	40	28	26	30	36	24	46	30
January	30	45	32	26	25	30	36	25	45	25
February	34	40	—	26	25	30	40	26	45	25
March	34	45	32	28	29	30	40	24	45	25

MONTH.	From April 1876 to March 1877.									
	Jowár.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
April	36	44	37	28	33	32	30	22	45	24
May	32	45	36	28	32	32	30	24	50	—
June	24	44	34	30	29	32	30	22	45	33
July	28	40	25	18	24	25	30	20	45	29
August	30	46	32	30	39	40	28	26	44	29
September	29	50	30	40	35	40	35	26	38	26
October	30	50	37	30	35	40	36	—	43	31
November	38	50	—	40	50	32	36	—	38	—
December	42	48	—	36	—	38	36	30	43	—
January	37	50	42	38	50	32	35	—	45	31
February	37	50	—	40	47	37	35	34	45	—
March	36	50	47	42	50	37	35	37	41	38

MONTH.	From April 1877 to March 1878.									
	Jowár.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
April	35	50	42	42	42	30	35	29	50	40
May	34	50	36	—	35	30	—	28	38	47
June	31	50	38	44	38	26	34	30	38	48
July	24	32	27	32	32	23	32	30	40	44
August	21	22	25	26	16	20	28	30	30	31
September	15	14	16	20	19	15	20	22	28	30
October	—	16	18	22	20	20	21	23	23	—
November	17	18	18	24	20	20	22	25	23	29
December	16	20	17	24	20	19	22	20	23	29
January	15	20	17	20	17	15	19	17	19	24
February	15	20	17	18	15	15	18	15	18	24
March	16	18	13	19	15	15	15	12	15	23

MONTH.	From April 1878 to Sept. 1878.										MONTH. (The price quoted is that with which the month ended.)
	Jowár.										
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsur.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.	
April	15	18	13	21	12	15	14	13	15	21	April.
May	13	18	10	17	10	10	12	9	14	19	May.
June	11	18	11	14	10	10	10	9	18	16	June.
July	10	20	16	12	19	18	10	14	21	17	July.
August	18	25	22	16	23	20	14	14	19	16	August.
September	20	35	22	21	28	20	17	18	21	—	September.
October	—	—	—	—	—	—	—	—	—	—	October.
November	—	—	—	—	—	—	—	—	—	—	November.
December	—	—	—	—	—	—	—	—	—	—	December.
January	—	—	—	—	—	—	—	—	—	—	January.
February	—	—	—	—	—	—	—	—	—	—	February.
March	—	—	—	—	—	—	—	—	—	—	March.

ANNUAL AVERAGES DEDUCTED FROM ABOVE MONTHLY PRICES.

—	April 1873 to March 1874.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritzar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	18	20	20	23½	23	19	20	18½	23½	18
Barley -	25	32	27	32	34	32½	30½	26	35½	35
Bájra -	21½	26	23	24	27½	20	16	22	35	23½
Jowar -	23½	30	26	29½	32	24½	27	23	38½	25

—	April 1874 to March 1875.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	21	21	24	25½	25	23	27	19	28	22
Barley -	30	30	31	41½	36	40	46	29	44	37½
Bájra -	23	25	20½	21	24	25	32	22	41	29
Jowar -	25	27½	27	35	31	26	32½	25	43	27½

—	April 1875 to March 1876.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gijránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	23	21	24	23	23	23	27	19	34	23
Barley -	31	34	33	38	35	37	39	25	47	34½
Bájra -	27	30½	24	24	28	25½	35	26	42	33
Jowar -	28	34	31	32	29½	30	37	26	52	29

—	April 1876 to March 1877.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gijránwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	26½	23	25	26	27	26½	31	21	34	24½
Barley -	37½	46	37	38	42	50	42½	30	42½	46
Bájra -	31	38	24	27	24½	30	37	25	43	26
Jowar -	33	47	35½	33	38½	35	33	27	43½	20

—	April 1877 to March 1878.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujránwála.	Soahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	17½	17	19	19	20	18	23	16	24	23
Barley -	25	28	26	26	30½	29	28	27	34	46
Bájra -	18	23	16	21	18½	19	25	20	27	26
Jowar -	22	27½	23	26	24	21	24	23	29	33½

—	April 1878 to September 1878.									
	Delhi.	Hissar.	Umballa.	Jullundur.	Amritsar.	Gujánwála.	Shahpur.	Mooltan.	Dera Ismail Khan.	Pesháwar.
Wheat -	16	14	19	18½	18½	17	18½	13	17	17
Barley -	21	25	26	23½	29	31	27	19½	22	26
Bájra -	15½	20	11	13	16	10	15	11	15½	14½
Jowar -	14½	22	16	17	17	15½	13	13	18	18

Chap. I. Qn. 16.

North-Western Provinces and Oudh.

Capt. Pitcher.

NORTH-WESTERN PROVINCES AND OUDH.

Captain Pitcher.—A table is appended giving normal prices in districts selected by the committee.

The usual variation at harvest time is that grain is one-fourth to one sixth-cheaper, judged by weight, than it is at other times, but this variation is due more to the grain containing more water when freshly garnered, and consequently weighing more than it does after lying in store for three or four months, and losing weight by the evaporation of moisture. A grain merchant when new gram comes into the market keeps up a difference of three or four seers between the old gram and the new.

As to the rise in price which indicates alarming scarcity, some officers would open relief works when grain was at 16 seers, while others would look calmly on until it rose to 10 seers; 12 seers, however, appears to the majority to be the limit, higher than which betokens scarcity. In past times of scarcity the rise has been sudden, and a bound of four seers at once in rise denotes disaster.

The effect of scarcity is to equalize all staples. When the coarse grains approximate wheat in price, and all have reached a common level of 12 seers, scarcity may be reasonably apprehended.

Table showing normal Prices of Principal Food Grains in selected Districts.

District.	Wheat.	Barley.	Juár.	Rice.	Gram.	Remarks.
Meerut	26	33	34	—	25	
Muzaffarnagar	24	37	27	15	28	
Kumaun	18	—	24	24	—	Mandua given instead of juár.
Garhwál	16	20	25	14	—	Ditto.
Tarái	23	40	—	30	28	
Muttra	25	35	—	—	32	
Mainpuri	20	25	25	—	—	
Moradabad	20	30	25	31	25	
Budaun	21	30	24	—	28	
Jalaun	22½	30	30	—	32	
Lucknow	18	27	24	24	23	
Bara Banki	21	—	40	20	—	
Rai Bareli	24¼	33¼	37	21	31½	
Bahraich	25	44	42	19	34	

The following table has been compiled from the price lists published in the Government Gazettes:—

Average Prices of Wheat from 1869 to 1878.

District.	Average of 1869.	Average of 1870.	Average of 1871.	Average of 1872.	Average of 1873.	Average of 1874.	Average of 1875.	Average of 1876.	Average of 1877.	Average of 1878.	Average of 10 years.	Remarks.
	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	Sr. ch.	
Meerut	13 0	15 13	25 3	21 11	20 13	20 13	22 8	25 15	19 15	15 0	20 2	
Agra	11 4	15 13	21 8	17 12	16 4	16 9	20 12	25 0	17 7	13 12	17 9	
Cawnpore	11 14	16 1	23 4	17 4	16 11	17 8	23 8	24 15	15 15	13 12	18 2	
Bareilly	10 13	17 12	26 6	19 9	16 13	17 4	21 12	24 8	16 8	14 8	18 9	
Lucknow	12 4	16 13	22 5	15 9	14 13	17 4	25 0	27 9	16 13	13 7	18 3	
Fyzabad	13 8	17 1	24 3	15 1	14 9	16 4	24 11	25 11	16 8	12 11	18 0	
Allahabad	10 12	13 14	19 12	15 0	14 8	14 11	19 13	24 7	15 4	12 1	16 0	
Gorakhpur	12 7	17 5	19 9	12 15	14 1	16 15	26 15	25 7	16 11	11 12	17 6	
Benares	11 13	13 0	15 3	12 15	13 7	14 12	20 11	21 15	14 8	13 0	15 2	
Jhánsi	9 9	15 5	21 15	17 3	13 9	17 8	19 8	23 11	18 5	14 8	17 2	
Average Prices of Barley from 1869 to 1878.												
Meerut	17 9	23 12	34 4	33 0	28 9	27 8	30 12	36 4	28 4	20 4	28 0	
Agra	15 14	26 0	29 8	24 1	21 13	24 1	29 1	33 5	23 12	18 15	24 9	
Cawnpore	15 5	22 9	30 11	24 13	22 0	22 1	31 3	39 3	24 4	18 12	25 2	
Bareilly	13 14	25 0	38 1	27 10	23 8	22 9	33 8	35 12	23 12	19 13	26 5	
Lucknow	16 0	23 15	34 3	20 14	19 15	21 12	31 9	38 12	24 5	18 8	25 0	
Fyzabad	17 5	23 4	33 0	19 14	20 15	22 7	33 12	37 12	24 1	17 4	25 0	
Allahabad	13 7	18 8	25 6	21 9	19 11	19 7	28 3	34 7	24 3	16 9	22 2	
Gorakhpur	16 13	25 11	33 11	19 3	19 8	18 11	40 4	37 4	23 8	16 4	25 2	
Benares	14 13	26 5	21 3	18 3	16 4	18 13	27 12	30 15	22 1	16 12	21 5	
Jhánsi	11 3	26 1	29 7	24 4	16 4	23 12	28 1	34 12	23 12	17 15	23 8	
Average Prices of Gram from 1869 to 1878.												
Meerut	12 1	15 0	21 15	23 7	25 8	25 13	27 8	33 8	25 13	15 13	22 9	
Agra	11 9	16 8	24 3	21 12	20 1	24 1	27 4	32 0	23 15	15 0	21 6	
Cawnpore	13 9	16 7	27 11	24 1	22 11	21 1	28 13	34 9	22 9	13 4	22 8	
Bareilly	10 5	17 8	26 14	25 0	22 15	20 11	28 11	31 1	21 7	15 5	22 0	
Lucknow	13 17	15 4	24 11	22 1	19 0	19 5	28 11	36 3	21 5	13 4	21 5	
Fyzabad	15 0	15 4	27 8	21 0	20 0	18 9	30 5	36 7	22 5	12 12	21 14	
Allahábad	12 11	14 3	21 8	23 9	19 11	19 13	27 4	35 8	23 12	12 13	21 2	
Gorakhpur	15 5	15 7	25 13	22 1	21 5	14 12	30 8	36 8	21 5	11 15	21 8	
Benares	13 4	13 0	19 0	21 7	19 3	17 12	24 5	28 8	20 13	12 5	19 0	
Jhánsi	10 11	18 15	28 9	21 13	16 0	20 9	22 0	30 8	23 7	15 12	20 13	
Average Prices of Joar from 1869 to 1878.												
Meerut	14 9	24 1	30 15	20 11	26 15	23 11	25 13	27 13	22 5	14 7	23 2	
Agra	15 4	25 5	26 13	19 9	21 1	21 0	26 4	29 13	22 0	15 0	22 3	
Cawnpore	14 15	23 7	26 12	22 12	22 0	22 0	28 0	37 14	21 12	14 9	23 6	
Bareilly	12 7	25 8	28 12	17 4	18 12	19 11	27 8	33 5	19 4	13 15	21 9	
Lucknow	15 11	21 5	27 6	17 14	17 0	20 7	32 13	41 5	23 6	17 11	23 8	
Fyzabad	21 0	26 12	32 12	25 2	24 9	21 9	35 2	43 2	23 14	21 13	27 9	
Allahabad	14 8	19 13	22 5	18 8	19 3	20 10	29 1	33 12	23 4	13 15	21 8	
Gorakhpur	23 14	27 14	27 12	28 13	23 7	19 0	36 0	38 4	23 1	20 5	26 13	
Benares	17 4	21 15	21 13	20 5	18 8	18 0	23 13	29 6	22 14	15 11	21 0	
Jhánsi	12 15	27 1	30 0	21 5	17 0	19 12	24 7	33 15	24 8	15 11	22 11	
Average Prices of Bájra from 1869 to 1878.												
Meerut	13 0	22 1	28 7	20 7	24 11	20 7	25 1	29 5	19 3	13 9	21 9	
Agra	13 3	21 15	23 11	16 13	28 5	17 9	25 9	29 15	18 7	13 1	19 13	
Cawnpore	13 15	23 5	25 3	21 6	20 6	22 3	28 4	35 1	19 1	13 4	22 3	
Bareilly	12 4	23 5	27 8	18 6	19 9	17 0	23 15	31 0	16 4	13 0	20 3	
Lucknow	13 1	21 1	21 4	17 9	16 9	18 15	26 15	38 3	18 9	13 11	20 9	
Fyzabad	14 8	17 0	23 9	17 2	18 6	16 1	21 0	28 7	21 0	13 13	19 2	
Allahabad	12 8	19 4	18 9	16 15	17 9	19 14	27 3	33 3	21 12	13 5	20 0	
Gorakhpur	17 8	16 10	31 4	no returns.	16 13	17 0	19 11	34 3	27 8	12 6	21 7	(nine years).
Benares	13 1	19 5	20 8	17 12	16 14	16 4	25 3	27 11	19 11	11 11	18 13	
Jhánsi	12 3	24 13	27 11	20 12	16 9	18 8	22 1	32 11	21 0	19 8	21 9	

NORTH-WESTERN PROVINCES AND OUDH.

upt. Pitcher.

District.	Average of 1869.	Average of 1870.	Average of 1871.	Average of 1872.	Average of 1873.	Average of 1874.	Average of 1875.	Average of 1876.	Average of 1877.	Average of 1878.	Average of 10 years.	Remarks.
AVERAGE PRICES OF COMMON RICE FROM 1869 TO 1878.												
Meerut -	9 4	13 4	16 8	14 5	12 4	13 1	15 9	17 15	13 3	9 0	13 6	
Agra -	10 8	12 3	13 8	13 0	13 9	10 5	12 1	14 0	11 4	8 0	11 13	
Cawnpore -	11 3	14 3	17 1	14 8	14 5	13 11	16 12	18 0	12 11	8 12	14 2	
Bareilly -	9 15	14 4	19 11	15 0	14 15	13 8	17 15	19 5	12 12	8 11	14 9	
Lucknow -	11 0	13 12	15 7	13 1	10 8	14 11	20 1	21 12	12 15	9 1	14 3	
Fyzabad -	10 15	13 0	15 12	12 15	15 6	14 8	19 13	21 8	13 1	9 3	14 9	
Allahabad -	10 13	14 3	15 9	14 8	14 5	13 9	18 3	21 7	15 3	10 4	14 13	
Gorakhpur -	15 1	19 1	22 15	18 4	17 11	14 4	22 7	23 11	14 0	10 12	17 13	
Benares -	9 5	12 9	11 13	11 15	12 11	10 15	16 5	19 11	14 9	11 5	13 2	
Jhánsi -	7 4	10 4	10 4	9 11	12 4	13 7	14 11	16 4	13 9	8 12	11 9	
AVERAGE PRICES OF ARHAR FROM 1869 TO 1878.												
Meerut -	11 0	16 3	24 8	23 13	24 4	15 11	18 4	27 3	21 7	9 11	19 3	
Agra -	10 5	18 1	26 5	22 10	17 15	14 5	19 0	28 7	20 0	9 15	18 11	
Cawnpore -	11 14	16 13	24 0	19 9	18 8	14 4	21 1	28 12	18 11	9 3	17 6	
Bareilly -	9 0	17 0	26 5	20 13	19 3	14 7	16 13	25 8	18 1	9 5	17 9	
Lucknow -	15 13	21 4	31 15	22 15	No returns.						23 0	(four years).
Fyzabad -	17 11	13 15	20 9	16 0	17 9	No returns.					17 3	(five years).
Allahabad -	10 4	14 8	19 12	17 13	15 15	14 9	19 11	27 3	21 0	9 7	17 0	
Gorakhpur -	13 8	12 15	19 9	14 13	16 1	13 0	20 3	28 12	18 13	9 8	16 11	
Benares -	9 3	11 11	14 15	14 1	13 9	11 11	15 15	20 9	17 1	8 11	13 11	
Jhánsi -	6 10	17 3	25 0	18 9	13 11	12 3	14 9	21 5	15 11	8 8	15 5	

BENGAL.

Ir. Toynbee.

BENGAL.

Prices.—The answer to question 16 has been exhibited in tabular form in the accompanying statement. The year 1876–77 was a fair average year, and the prices ruling during that period were fairly normal prices. The table for the year 1873–74 shows the convergence towards, that for the next year the divergence from, famine prices. The figures in column 3 of annexure II. give what may be taken as the fair average normal price for rice, the great staple article of food over all Bengal. Other averages are given in the answer to question 19. Prices usually rise at two seasons of the year; *firstly,* before harvest, when the safety of any crop is assured, and *secondly,* after harvest, when it has been threshed out. In the one case the old surplus stocks are brought into the market, in the other the new grain. In some parts of Bengal prices rise in the interior of each district during the months of July, August, and September, owing to the difficulties of transport in the rainy season; in other districts, such as those of Eastern Bengal, where the internal communication is chiefly by water, prices tend to fall during these months. But, generally speaking, the food markets are affected chiefly in the manner explained above. Of late years, owing to the improvement of communications and the stimulus given to the grain trade by recent famine operations, a third and most important element of fluctuation has been introduced, viz. the demand for export to other districts or provinces, and the people, as others have done before them, are learning that what are called the blessings of civilisation do not always carry with them an improvement in their social condition. In former years surplus stocks were kept by the people because there was no market for them. The holders could afford to pay liberally in grain for field labour after putting aside sufficient for their own wants. Now they are tempted by high prices to sell off these stocks. If famine comes they have to buy at higher prices than those at which they sold: they incline to pay for field labour in cash instead of in grain, and the labourer consequently finds his stomach more empty than it was, especially where, as in Behar, the rate of wages has not risen proportionately with prices. The pinch of short rations is spread over a larger area and borne by a greater number than before; but it is none the less a pinch when it comes, and it comes now more frequently. It seems likely that the enormous stimulus recently given to trade in grain will have the effect of altogether revolutionising the economic conditions of the food-supply of Bengal. It has hitherto generally been held that any rise in price which quoted the staple food-grain at less than 12 seers to the rupee would indicate the approach of scarcity and the non-existence of large stocks; and that the non-landed and poorer artisan and shopkeeping class would feel this pressure, and could tide it over for only a short time; while prices ranging between 10 and 8 seers per rupee would denote scarcity requiring relief measures, and anything below 8 seers would indicate the existence of famine. But in fact all such calculations have been to a great extent falsified by the experience of the past year. Prices which would have been deemed famine prices in 1874 have been borne by the people of many districts without the appearance of any actual distress. The profits of the agriculturist have been so high that he has been able to hold on and support his field labourers in a manner perfectly surprising. Moreover the local circumstances of nearly every district in Bengal vary and differ so much that what would indicate famine in one does not necessarily do so in another.

A reference to the statement will show that in 1873–74 the rise in prices was fairly gradual, and that at no time was there any absolute deficiency of supply owing to famine such as there was in Orissa in 1866. In the present improved state of the trade and communications of the province, any future scarcity is not likely to be attended or marked by any very sudden rise or fluctuation.

When scarcity supervenes, and the prices of the ordinary grains rise, the people are driven to purchase the coarser and cheaper food-grains; the demand for these increases, and their price rises in greater proportion than that of the dearer classes of food, but ever to such an extent as to produce equality.

CHAP. I.Q.
BENGAL.
Mr. Toyn

STATEMENT showing MONTHLY VARIATIONS in the RETAIL PRICES of FOOD in selected Districts of BENGAL during the years 1873–74, 1874–75, and 1876–77.

From April 1873 to March 1874.

Name of District.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
Common Rice.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.
Burdwan	24 0	26 0	19 0	17 0	19 0	21 0	17 0	14 10	15 3	14 3	13 6	13 7
24-Pergunnahs	20 0	17 0	19 0	18 0	19 0	18 0	20 0	13 0	11 9	11 5	11 7	12 11
Moorshedabad	22 0	18 0	18 0	19 0	16 0	16 0	15 0	13 0	12 14	12 0	11 10	11 10
Backergunge	28 0	28 0	26 0	26 0	26 0	26 0	25 0	17 5	13 13	17 8	13 14	16 0
Chittagong	24 0	24 0	24 0	24 0	21 0	20 0	24 0	20 5	16 8	17 12	15 14	15 10
Patna	22 0	18 0	18 0	17 0	17 0	16 0	14 0	13 0	14 6	12 12	13 2	12 8
Durbhunga	21 0	20 0	17 0	18 0	18 0	16 0	15 5	12 0	10 5	10 0	10 0	8 5
Bhagulpore	16 0	16 0	16 0	17 0	17 0	17 0	17 0	12 10	12 2	12 12	11 13	11 9
Pooree	42 0	38 0	34 0	34 0	35 0	35 0	34 0	33 0	23 0	22 0	23 10	27 3
Hazareebagh	17 0	17 0	16 0	14 0	14 0	14 0	13 0	13 0	13 14	13 4	12 14	12 6
Wheat.												
Patna	17 0	16 0	16 0	16 0	15 0	14 0	12 0	12 0	16 6	16 4	15 12	15 8
Durbhunga	14 0	14 0	13 0	13 0	11 5	11 0	11 0	10 0	10 0	12 0	12 0	10 0
Bhagulpore	18 0	20 0	17 0	15 0	15 0	14 0	12 0	12 0	12 10	12 5	13 4	14 15
Barley.												
Patna	28 0	28 0	27 0	28 0	26 0	24 0	18 0	17 5	18 6	18 9	18 8	19 4
Durbhunga	31 0	28 0	25 0	25 0	25 0	24 0	19 0	16 0	18 0	13 0	—	—
Bhagulpore	31 0	31 0	30 0	27 0	27 0	22 0	22 0	20 0	19 4	19 11	16 6	18 0
Maize or Indian Corn.												
Patna	40 0	35 0	28 0	26 0	25 0	25 0	20 0	17 10	18 8	17 9	17 3	18 5
Durbhunga	—	30 0	28 0	26 0	—	26 0	22 0	17 0	14 0	12 0	12 5	13 0
Bhagulpore	27 0	30 0	—	—	26 0	30 0	21 0	17 0	18 2	15 8	14 7	15 2

From April 1874 to March 1875.

Name of District.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
Common Rice.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.
Burdwan	13 12	14 0	12 4	12 0	11 4	11 12	12 12	12 12	18 8	19 0	21 0	20 8
24-Pergunnahs	13 5	12 0	11 7	12 9	12 13	11 4	11 4	12 12	13 5	13 5	16 0	17 12
Moorshedabad	10 4	10 0	11 0	12 0	11 4	11 0	12 8	16 8	18 0	19 8	20 4	20 0
Backergunge	16 0	14 8	13 0	14 0	14 4	14 0	13 0	13 8	20 0	21 0	21 0	22 0
Chittagong	17 0	17 0	14 8	15 12	16 0	15 0	16 0	20 0	20 0	20 0	20 0	20 0
Patna	13 0	13 0	14 0	14 0	16 0	15 0	15 8	19 0	24 0	14 0	25 0	25 0
Durbhunga	8 8	8 8	11 0	15 0	14 0	14 0	17 0	18 0	25 0	19 0	18 0	18 0
Bhagulpore	11 6	10 1	11 6	12 10	12 12	12 10	13 4	15 2	25 4	22 11	22 12	21 7
Pooree	28 14	29 9	27 9	23 10	21 0	23 10	23 10	23 10	27 9	27 9	24 15	27 9
Hazareebagh	12 8	11 8	12 4	14 0	13 0	15 0	15 0	18 0	20 8	22 0	20 0	22 0
Wheat.												
Patna	16 0	15 8	17 0	17 4	16 8	16 8	17 4	17 8	19 0	19 0	19 0	18 0
Durbhunga	10 0	11 8	12 0	13 0	13 0	13 8	14 8	14 0	15 0	13 0	13 0	14 0
Bhagulpore	15 2	13 14	13 14	15 2	15 2	15 12	16 6	17 0	17 11	18 15	18 5	18 15
Barley.												
Patna	19 0	18 0	19 8	19 12	19 12	20 8	27 0	26 0	30 0	30 0	30 0	28 0
Durbhunga	13 0	14 0	16 0	17 0	16 0	18 0	17 0	18 0	16 0	21 8	—	—
Bhagulpore	20 3	18 15	17 11	18 15	20 3	22 11	20 3	20 3	20 3	22 11	20 3	18 15
Maize or Indian Corn.												
Patna	19 0	17 8	18 8	18 6	18 4	20 0	23 0	23 0	27 0	27 8	28 0	26 0
Durbhunga	12 8	13 0	17 0	16 0	16 0	22 8	28 0	30 0	34 0	28 0	27 0	28 0
Bhagulpore	14 6	15 0	13 14	15 0	16 3	25 0	28 8	35 0	30 5	36 0	29 0	31 8

From April 1876 to March 1877.

Name of District.	April.	May.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.
Common Rice.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.	s. c.
Burdwan	26 4	25 2	22 12	22 2	22 6	24 4	25 0	21 0	17 2	20 8	21 2	21 2
24-Pergunnahs	17 4	17 12	17 12	16 12	16 6	17 8	17 8	15 4	13 10	14 4	13 14	14 4
Moorshedabad	21 0	21 0	21 8	22 8	22 0	22 0	23 0	20 8	19 8	20 0	20 8	20 0
Backergunge	22 0	22 0	22 0	23 0	23 0	23 0	23 0	16 8	17 8	18 0	17 0	15 8
Chittagong	17 8	15 0	14 0	14 0	15 0	17 0	18 0	15 8	17 0	15 0	14 8	13 0
Patna	23 0	21 8	20 8	19 8	19 0	18 8	19 0	21 0	22 4	23 0	22 0	21 4
Durbhunga	15 5	15 8	17 4	15 8	15 8	15 12	18 0	23 2	21 6	22 8	20 12	20 6
Bhagulpore	21 8	21 2	20 3	18 10	16 6	17 11	18 15	18 5	20 13	23 0	21 11	22 1
Pooree	27 9	26 14	21 0	21 10	22 5	24 0	24 0	19 11	17 1	17 1	17 1	17 1
Hazareebagh	24 8	24 12	22 2	20 0	20 8	21 4	22 8	27 0	26 8	22 6	21 2	23 2
Wheat.												
Patna	25 8	26 8	24 0	22 8	24 0	24 8	24 0	23 8	21 0	20 8	15 8	18 8
Durbhunga	20 12	20 12	19 4	18 0	17 12	18 0	18 10	20 4	18 0	17 0	15 14	15 14
Bhagulpore	23 5	22 12	19 9	19 10	25 5	21 0	18 15	19 11	16 6	17 0	16 5	15 2
Barley.												
Patna	37 12	38 8	36 8	32 8	32 0	31 0	32 0	31 8	33 12	35 8	29 0	34 8
Durbhunga	35 8	33 8	30 8	28 8	29 10	31 14	23 0	35 12	37 0	35 12	31 0	25 12
Bhagulpore	37 15	37 15	35 6	31 4	25 3	30 13	26 8	24 0	17 10	1 10	17 10	17 10
Maize or Indian Corn.												
Patna	42 4	39 8	32 8	30 0	31 0	37 0	41 4	41 4	39 8	40 0	38 0	34 8
Durbhunga	33 2	30 6	27 6	26 6	27 8	30 4	37 6	41 4	42 0	37 12	32 6	31 4
Bhagulpore	37 15	37 15	—	—	30 4	37 14	38 8	36 13	34 2	31 2	31 9	31 1

ꞏP. I.Qn.16.

ꞏENTRAL ROVINCES.

r. *Nicholls.*

CENTRAL PROVINCES.

I have selected Saugor for the extreme north, Hoshangabad for the Nerbudda Valley, Seoni for the Satpura districts, Wardha for the Southern districts and Raipur for Chhattisgarh. These dictricts appear to the be fairest, being free from large cities, large military stations, and exceptional circumstances, and in the following table I have shown the range of prices for December, January, February, and of May and June for the year 1866–67, for 1872–73, and again, with a view to show the progress of the present tightening of prices, for the three past years. This present dearness of grain is caused, as already shown, by the famine in the west and south of India by exports to England, and by the blight which nearly destroyed our rabi crops in the spring of this year.

STATEMENT showing Price Current of Food-grain in certain Districts of the Central Provinces.

		1866–67.					1872–73.					1875–76.					1876–77.					1877–78.				
		December.	January.	February.	May.	June.	December.	January.	February.	May.	June.	December.	January.	February.	May.	June.	December.	January.	February.	May.	June.	December.	January.	February.	May.	June.
Saugor.	Wheat - - -	12·2	12·5	15·5	20·10	19·14	16·1	15·8	14·1	16·8	14·9	20·	26·	20·8	31·	30·	26·	25·	25·	23·10	25·	18·	15·8	14·	15·	14·
	Rice (commom) - -	10·7	11·0	11·3	11·13	12·3	14·	14·	12·1	10·2	11·2	17·	17·	17·	18·	16·	16·	16·	15·	14·8	14·8	7·8	8·	6·	6·8	7·
	Millets - - -	19·0	20·15	23·9	26·13	26·	24·2	24·2	23·3	22·4	—	35·	32·	24·	—	—	—	32·	32·	—	—	21·	18·8	17·	—	—
	Lesser Millets - -	—	—	—	—	—	37·3	37·3	37·3	—	—	—	—	—	—	—	—	23·	23·	—	—	—	—	17·	—	—
Hoshangabad.	Wheat - - -	12·	13·	14·8	15·	14·	14·5	13·6	15·4	18·8	16·7	17·8	18·	18·4	19·8	18·	16·10	17·8	17·8	16·	17·7	16·	15·12	12·	10·2	9·
	Rice - - -	8·	8·	8·	7·8	8·	10·3	12·1	13·	11·4	11·1	13·	13·8	13·8	12·6	12·6	12·6	13·8	12·6	10·12	11·4	5·10	7·14	6·12	6·12	6·3
	Millets - - -	18·	22·	20·	15·	12·	24·3	26·1	19·5	19·5	—	—	19.	—	—	—	—	19·8	19·8	—	—	18·4	20·	14·10	13·	11·8
	Lesser Millets - -	—	—	—	—	—	22.4	20·5	20·5	—	—	—	—	—	—	—	—	19·	—	—	—	14·6	18·	13·8	12·6	—
Seoni.	Wheat - - -	13·	15·	18·	24·	26·	25·2	25·2	24·2	27·	25·2	33·	24·	30·	34·	34·	25·	23·5.	24·	25·	25·	22·	20·	12·	11·	10·
	Rice - - -	12·	12·	12·	11·	10·	14·9	14·9	16·8	14·9	14·9	23·	25·	27·	28·	24·	24·	22·	23·	20·	16·	16·	15·	10·	10·	10·
	Millets - - -	20·	20·	25·	20·	—	29·8	29·8	30·8	24·2	23·3	—	32·	—	—	—	30·	—	—	—	—	—	—	—	—	—
	Lesser Millets - -	—	—	—	—	—	32·6	32·6	32·6	32·6	26·1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Wardha.	Wheat - - -	10·8	10·7	11·3	13·6	13·15	16·3	15·8	17·7	16·3	15·8	24·6	20·	24·3	29·11	25.3	18·	19·1	19·6	16·5	16·6	17·	15·	15·	11·	11·
	Rice - - -	8·13	9·4	9·15	10·	10·10	11·2	11·2	11·2	11·2	9·3	12·12	14·	13·7	12·6	13·	11·7	15·	13·9	12·3	13·	9·8	9·	8·12	9·8	8·8
	Millets - - -	18·13	17·2	19·2	22·	20·15	21·4	22·4	22·4	21·4	20·5	42·15	23·11	40·	28·8	25·	22·4	21·12	21·8	18·7	18·13	19·	17·	17·	17·8	18·
	Lesser Millets - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Raipur.	Wheat - - -	17·	18·	18·	32·	46·	44·8	44·8	49·5	44·8	37·3	52·	56·	60·	56·	56·	52·	56·	56·	44·	44·	32·	32·	24·	20·	17·
	Rice - - -	16·	16·	16·	24·	26·	26·1	44·8	44·8	40·1	37·3	34·	38·4	36·	38·	34·	32·	34·	38·	34·	32·	26·	28·	21·	20·	19·
	Millets - - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Lesser Millets - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

AP.I. Qx.16.

CENTRAL PROVINCES.

r. *Nicholls.*

My figures do not conclusively indicate any usual variation between the prices at harvest time and other times of the year, and experience does not warrant any conclusion.

It would be impossible to predict the approach of alarming scarcity solely from an examination of the local price current. It is absolutely necessary for a deputy commissioner to have a fairly correct idea of stocks, out-turn trade, and especially of the export trade, not only of his own district, but of neighbouring districts, and of neighbouring territories and Provinces. Without this, his own price current would only mislead him.

Before the severe scarcity of 1868–69 on our black cotton soils, and in the northern districts prices had been tightening for three years, and it was chiefly the purchasing power of the people which at length failed. The prices which ruled in the worst times were not much higher than our present rates.

But in the rice countries there was a rise, after the single failure of the staple crop in 1868, of nearly 50 per cent. in four months, after which it remained nearly stationary. The prices of other staples were similarly affected. Here the rise was sudden.

I will compare the prices of wheat and rice in the early part of 1868 with those for the corresponding period of 1869 for Bhandara and Raipur :—

—		January.		February.		March.		April.		May.	
		1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.	1868.	1869.
Bhandara -	Wheat -	25	11	20	10	23	11½	22	11⅜	22	10
	Rice -	28	11	25	11⅛	24	10¼	19	10¾	20	9¼
Raipur -	Wheat -	48	14	44	16⅝	52	16½	52	16¾	52	15
	Rice -	40	13½	40	14	44	14	40	13¼	40	12

This table does not show very clearly that the ordinary difference in the relative price of wheat and of rice was lost sight of.

In Nagpur and Wardha where jowari ordinarily is from ¼ to ⅓ cheaper than wheat, at a time when there was an excessive demand for jowari for the Deccan, and a fair demand, but a want of railway carriage, for wheat for export viâ Bombay to England, jowari was in 1877 sold dearer than wheat.

In ordinary years we may see marked fluctuations in the relative prices of wheat and of rice in the same district. For instance, at present in Seoni, where this year the wheat crop was almost entirely lost, wheat and rice are selling at the same rate, 10 seers for a rupee. But I find throughout 1866–67 and 1872–73, and up to December in 1875, wheat sold cheaper than rice. In that last month wheat was at 33 seers and rice 23. In the next month wheat went to 24 and rice to 25, next month wheat sold at 30 and rice at 27. Since then wheat has been cheaper than rice, but gradually approaching till June 1878, when the price stands at 10 seers the rupee for either sort. This is due to the loss of the wheat crop.

But I think, generally speaking, during our famine of 1868–69 the various sorts of grain maintained their ordinary relative values.

BERAR.

. Dunlop.

BERAR.

I have selected the Yeotmal taluka of the Wun district as a typical district in the upland country off the railway line, and the Amraoti district as a typical district in the low-land country which has railway communication.

The rates for jowari and wheat in these two districts have been as follows :—

—	Jowari.		Wheat.	
	Seers per rupee.		Seers per rupee.	
	Amraoti.	Yeotmal.	Amraoti.	Yeotmal.
1861–62 - - -	—	40	—	20
1862–63 - - -	—	27	—	12
1863–64 - - -	30	19	20	11
1864–65 - - -	16	24	16	10
1865–66 - - -	32	24	16	9
1866–67 - - -	20	24	8	8
1867–68 - - -	25	22	16	10
1868–69 - - -	15	18	10	10
1869–70 - - -	25	25	11	10
1870–71 - - -	30	22	12	10
1871–72 - - -	22	22	14	12
1872–73 - - -	32	22	16	16
1873–74 - - -	32	45	15	16
1874–75 - - -	46	60·25	19	23·75
1875–76 - - -	48·5	45·25	24·75	23·75
1876–77 - - -	21¼	11	15	19½
1877–78 - - -	14	17	11	10
1878–79 - - -	17	20	10	10

BOMBAY.

CHAP. I. Qn. 1

BOMBAY.

Mr. Peile.

A tabular statement among the appended papers gives the prices of produce (number of seers of about 2lbs.) per rupee in all the Bombay districts between 1861 and 1874. It is difficult to say what are normal prices, because prices are continually fluctuating. They were rather high in the Bombay Presidency up to A.D. 1818, then fell continuously to A.D. 1850, then rose up to 1870, being especially high in 1864–1869, and since 1870 have declined until famine raised the price of grain. The following rates, however, may be taken as a fair average:—

Number of pounds to be bought for 1 rupee.

—	Wheat.	Rice, common.	Jowari.	Bajri.	Kodra.	Nagli.
Guzerat -	20—25	16—20	30—35	30	40	—
Khandesh -	30	—	49—50	40	—	—
North Deccan	30	—	40—50	50	—	—
South Deccan	30	20	40—50	40—50	—	—
Concan -	20	23	15—20	15—20	—	33

Prices are from one-eighth to one-fourth higher at seed time than at harvest.

The following rises in past time have indicated severe scarcity:—

Number of pounds to be bought for one rupee.

—	A.D. 1790–91.				A.D. 1804–5.			
	Wheat.	Bajri.	Jowari.	Rice.	Wheat.	Bajri.	Jowari.	Rice.
Guzerat - -	6¾	16	17	4¾	—	—	—	—
Khandesh - -	12¾	13	—	6	14	14	—	5
North Deccan -	4	3½	4	4	3	4¼	4	3
South Deccan -	3¼	—	7	3¼	2½	—	3	1½
Concan - -	—	—	—	18	—	—	—	24

The rises appear to have continued over two or three years, probably bad harvests, and to have affected all the staples.

The following table compares prices of jowari and bajri in a cheap year (1868) with the highest prices in the late famine:—

District.	A.D. 1868.	A.D. 1877.	
		August.	September.
	Lbs.	Lbs.	Lbs.
Khandesh - -	27	19	18
Nasick - - -	24	18	17
Ahmednagar - -	46	14	14
Poona - - -	37	13	14
Sholapur - - -	47	11	12
Sattara - - -	45	12	13
Kaladgi - - -	53	10	9
Belgaum - - -	45	9	12
Dharwar - - -	71	9	11

MADRAS.

MADRAS.

Board of Revenue.

The four tables given below show the average monthly prices in terms of seers of 80 tolas per rupee of each of the main staples, viz., rice, ragi, cholum, and cumbu for the three years ending 1875–76, which may be taken as fairly representing the normal rates. In the Appendix will be found a statement showing the monthly average prices for each station of the Presidency.

A.

SECOND SORT RICE.

AVERAGE PRICES during the Three Years ending 1875–76 in terms of Seers of 80 Tolas.

Districts.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Ganjam - - -	23·01	21·48	21·90	23·06	22·70	22·11	22·31	22·22	22·03	22·10	21·27	21·05
Vizagapatam - -	19·62	18·77	18·26	18·61	18·99	18·85	18·43	18·64	18·76	18·48	17·92	17·18
Godavari - -	19·34	18·97	19·15	19·50	20·03	20·06	20·21	20·77	21·06	21·91	20·36	20·11
Kistna - - -	16·43	16·19	16·41	16·73	17·13	17·90	18·19	18·80	18·76	18·79	18·48	17·83
Nellore - - -	16·81	16·75	16·48	16·42	16·47	15·96	15·54	15·36	15·22	15·28	15·65	15·78
Cuddapah - -	18·50	18·13	18·13	18·05	17·69	16·94	16·89	16·86	16·98	16·88	17·36	17·39
Bellary - - -	17·22	17·06	17·03	16·75	16·34	16·23	16·65	16·84	16·79	16·88	16·84	16·85
Kurnool - - -	14·44	14·30	14·41	14·20	14·22	14·34	14·67	14·72	14·98	15·04	14·98	14·89
Madras - - -	13·99	14·66	14·12	13·80	13·99	13·49	13·05	13·57	13·27	13·58	13·49	13·36
Chingleput - -	17·07	16·51	16·37	16·66	16·81	16·49	16·27	16·75	16·86	16·91	17·00	17·02
North Arcot - -	17·88	17·50	17·44	17·84	17·79	17·80	16·34	16·04	15·82	16·05	16·17	16·41
South Arcot - -	17·35	16·88	16·88	16·77	17·30	16·63	15·75	16·57	16·70	17·01	16·20	16·21
Tanjore - - -	15·20	15·16	14·50	15·19	15·83	15·06	15·06	14·23	15·32	15·50	15·07	14·87
Trichinopoly - -	14·66	14·56	14·53	14·53	15·23	15·37	14·90	13·86	14·06	14·13	14·58	14·11
Madura - - -	14·58	14·21	13·88	13·55	13·82	14·27	13·64	13·74	14·33	14·99	14·64	14·00
Tinnevelly - -	12·60	12·47	12·40	12·76	12·86	12·79	12·52	12·39	12·86	13·01	12·70	11·95
Coimbatore - -	13·84	13·58	13·36	13·31	14·02	13·90	13·66	13·71	13·72	13·56	13·61	13·22
Nilgiris - - -	10·04	9·83	10·05	9·82	9·61	10·06	9·93	9·94	10·17	10·19	10·23	9·90
Salem - - -	15·26	15·16	14·83	15·26	15·59	15·45	14·94	14·78	14·48	14·92	14·77	14·38
South Canara - -	13·36	13·60	13·60	14·01	14·29	14·45	14·55	14·38	14·28	13·93	13·46	13·12
Malabar - - -	12·90	12·71	13·17	13·68	13·81	13·45	13·42	13·00	12·96	13·10	12·54	12·46

B.

RAGI.

AVERAGE PRICES during the Three Years ending 1875–76 in terms of Seers of 80 Tolas.

Districts.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.
Ganjam	36·76	34·65	36·33	41·49	41·60	39·82	38·83	38·99	38·90	38·49	37·57	36·94
Vizagapatam	31·02	30·20	31·10	34·79	34·85	34·54	33·27	32·57	32·83	32·41	32·05	30·22
Godavari	34·66	33·99	34·23	34·50	36·06	35·91	36·30	36·87	36·14	37·14	36·29	36·39
Kistna	29·98	29·28	29·30	28·99	29·38	31·46	32·67	33·83	34·86	34·42	34·34	34·08
Nellore	29·51	28·64	27·62	27·86	27·43	26·49	26·45	26·56	27·08	27·69	29·00	29·41
Cuddapah	31·47	30·25	30·25	30·76	30·09	29·69	29·06	28·87	29·50	30·20	30·60	30·71
Bellary	33·16	31·89	31·90	31·29	32·06	32·02	31·67	31·60	31·95	31·27	30·84	29·96
Kurnool	27·97	26·71	24·90	26·07	24·90	26·55	26·47	26·73	27·45	28·24	28·20	27·27
Madras	24·83	24·66	25·08	24·48	24·66	24·26	23·40	23·11	23·18	22·95	23·05	22·28
Chingleput	25·07	24·28	24·34	26·12	26·10	25·06	23·64	23·54	23·63	23·93	24·10	23·68
North Arcot	30·98	29·05	30·02	30·44	29·97	27·88	26·11	25·61	25·88	25·89	26·64	26·22
South Arcot	25·88	25·14	27·08	30·16	31·23	29·55	27·16	26·65	25·65	25·52	25·11	24·88
Tanjore	25·85	26·07	27·42	29·69	31·78	30·77	29·30	26·74	27·44	27·03	26·12	26·71
Trichinopoly	26·56	25·52	25·58	27·71	29·22	28·71	28·92	26·98	25·55	26·62	26·03	25·56
Madura	29·51	29·26	29·32	28·93	28·79	30·90	29·84	29·30	29·27	30·02	30·10	28·57
Tinnevelly	24·12	23·65	24·27	24·57	24·55	26·43	27·35	26·49	26·69	26·36	25·30	24·48
Coimbatore	27·19	26·62	25·80	25·90	27·55	28·41	27·19	26·28	26·21	25·80	25·51	25·00
Nilgiris	18·02	18·16	17·87	17·46	17·85	18·30	17·79	17·33	17·33	17·22	17·23	16·82
Salem	29·69	30·52	30·31	30·91	30·65	28·86	26·47	26·09	26·70	27·89	27·69	27·28
South Canara	20·48	20·45	20·71	20·81	21·64	22·01	22·34	22·02	21·51	20·92	20·09	19·55
Malabar	22·76	23·28	23·72	24·20	23·56	23·35	22·16	22·37	21·51	21·08	20·20	20·05

C.

CHOLUM.

AVERAGE PRICES during the Three Years ending 1875–76 in terms of Seers of 80 Tolas.

Ganjam	28·56	28·35	28·70	28·22	29·77	29·90	29·78	32·88	31·51	31·02	28·45	27·27
Vizagapatam	31·44	30·53	30·23	30·54	32·32	33·90	31·98	33·98	33·60	31·81	32·14	27·73
Godavari	31·82	31·39	31·46	32·15	32·24	32·66	34·38	36·29	36·86	37·16	36·32	35·50
Kistna	23·68	23·99	24·77	25·42	24·96	26·58	27·78	29·02	29·13	28·57	27·88	27·35
Nellore	25·79	25·37	24·13	24·40	24·15	23·86	24·26	24·71	24·55	25·61	26·03	26·39
Cuddapah	28·36	27·39	27·93	27·71	27·96	27·38	26·70	26·81	27·02	27·09	27·82	27·90
Bellary	29·34	29·04	28·25	28·58	29·56	29·05	28·88	28·70	28·89	28·76	28·67	27·94
Kurnool	25·69	25·17	24·03	25·07	26·67	26·46	27·66	28·13	28·40	27·97	27·12	25·97
Madras	22·32	22·32	21·24	21·96	21·96	22·44	20·46	20·32	20·65	19·61	20·10	20·15
Chingleput	19·74	20·21	20·07	19·70	20·90	20·72	17·60	20·46	17·63	19·62	18·45	19·08
North Arcot	26·44	27·81	28·16	28·03	26·28	25·64	22·19	22·51	23·20	23·54	24·67	23·34
South Arcot	28·29	26·51	26·00	26·77	30·03	30·09	29·07	27·92	26·53	28·60	26·51	27·52
Tanjore	22·78	22·07	23·19	26·13	28·83	27·74	26·86	23·11	24·42	24·51	25·59	24·06
Trichinopoly	29·78	24·07	25·73	25·38	26·04	26·65	28·68	31·85	28·87	34·10	32·64	31·21
Madura	32·97	30·99	29·08	28·82	29·65	31·32	31·34	33·12	34·17	32·79	34·07	31·32
Tinnevelly	23·91	23·57	23·83	23·78	23·46	23·28	23·40	23·20	23·91	25·84	22·35	22·37
Coimbatore	21·99	21·82	21·32	20·81	21·72	22·21	21·21	21·00	21·36	21·14	21·18	21·17
Nilgiris	17·00	16·97	16·84	16·85	16.90	16·99	16·4	15·28	15·81	14·96	14·03	15·
Salem	26·52	27·05	26·33	26·74	25·74	25·21	24·33	23·92	23·11	24·25	23·90	24·01
South Canara	—	—	—	—	—	—	—	—	—	—	—	—
Malabar	—	—	—	—	—	—	—	—	—	—	—	—

D.

CUMBU.

AVERAGE PRICES during the Three Years ending 1875–6 in terms of Seers of 80 Tolas.

Ganjam	28·16	29·93	34·67	35·21	35·53	32·97	31·53	32·28	31·97	30·58	31·42	31·44
Vizagapatam	31·52	31·59	35·47	38·65	37·76	38·25	36·20	35·31	33·42	33·87	33·81	30·75
Godavari	34·14	34·32	35·42	36·34	36·59	36·96	36·97	36·40	36·34	37·24	37·19	35·94
Kistna	26·58	24·71	23·96	27·33	27·61	28·33	28·92	30·23	29·83	29·15	29·47	28·40
Nellore	22·90	22·56	22·43	24·82	26·01	24·34	24·15	23·81	23·69	23·79	23·20	23·11
Cuddapah	29·20	28·40	29·04	29·88	29·91	28·76	27·85	27·72	27·27	27·53	27·88	27·89
Bellary	26·60	25·83	25·68	25·00	25·69	26·33	26·37	26·56	26·53	26·37	25·67	25·18
Kurnool	22·29	23·72	23·83	25·34	25·99	24·74	25·51	26·92	25·17	26·27	24·15	23·74
Madras	20·24	20·24	20·68	20·24	20·24	20·68	19·80	19·36	19·36	19·36	19·36	19·36
Chingleput	26·16	25·08	22·44	21·57	23·32	22·44	22·35	23·29	19·36	21·38	19·68	17·05
North Arcot	25·08	25·76	25·97	27·15	26·80	25·61	23·90	22·60	22·81	22·15	22·15	22·26
South Arcot	24·24	26·53	27·92	29·81	30·46	28·28	25·46	24·85	24·01	23·94	23·41	23·55
Tanjore	24·38	23·36	24·76	28·20	30·14	29·67	27·92	25·30	24·13	23·53	22·48	22·97
Trichinopoly	24·08	23·97	23·63	25·67	28·94	29·01	20·31	26·16	24·44	24·40	23·91	23·52
Madura	28·00	27·02	27·51	27·56	27·87	28·74	28·56	28·13	28·39	29·12	28·45	27·32
Tinnevelly	21·47	20·71	21·25	20·57	20·67	21·62	23·66	25·09	25·59	24·30	22·40	21·53
Coimbatore	25·40	25·69	24·58	25·05	26·30	27·61	26·96	25·31	25·33	25·04	24·21	23·97
Nilgiris	15·64	16·37	16·61	15·43	16·58	16·53	16·66	16·25	15·66	15·54	13·79	14·89
Salem	25·23	27·17	28·38	28·62	29·24	28·29	25·58	24·35	23·82	23·92	28·70	23·41
South Canara	—	—	—	—	—	—	—	—	—	—	—	—
Malabar	—	—	—	—	—	—	—	—	—	—	—	—

Though, on the whole, prices seem to run lower at harvest time than at other times, it is by no means invariably the case. From the tables given above it appears that in Ganjam, which may be taken as a typical district for ragi, the average monthly prices for the three years in question varied from 41·60 seers per rupee in November to 34·65 seers in August, the latter month being also the harvest month. In Salem, where the ragi harvest is in October, the highest price appears to have been reached in February, and the lowest in August.

The limit of ordinary annual variation in prices may be gathered from the following table, which has been abstracted from the tables of averages above given, and shows the per-centage of increase over the lowest price :—

E.

Districts.	Rice, Second Sort.		Cholum.		Cumbu.		Ragi.	
	Limits of Variations.	Per-centage of Column 2 to lowest Price.	Limits of Variations.	Per-centage of Column 4 to lowest Price.	Limits of Variations.	Per-centage of Column 6 to lowest Price.	Limits of Variations.	Per-centage of Column 8 to lowest Price.
1	2	3	4	5	6	7	8	9
Ganjam - - -	2·01	9	5·61	17	7·37	21	6·95	17
Vizagapatam - -	2·44	12	6·25	18	7·13	18	4·65	13
Godavari - -	2·94	13	5·77	15	3·10	8	3·15	9
Kistna - - - -	2·61	14	5·45	19	6·27	21	5·66	16
Nellore - - - -	1·59	9	2·53	10	3·58	13	3·28	11
Cuddapah - - -	1·64	9	1·66	6	2·64	9	2·60	8
Bellary - - -	0·99	6	1·62	5	1·69	6	3·20	9
Kurnool - - -	0·84	5	4·37	15	4·63	17	3·34	11
Madras - - - -	1·61	11	2·83	12	1·32	6	2·80	11
Chingleput - - -	0·80	5	3·30	16	9·10	35	2·58	10
North Arcot - - -	2·06	11	5·97	21	5·00	18	5·37	17
South Arcot - - -	1·55	9	4·09	13	7·05	23	6·35	20
Tanjore - - -	1·60	10	6·76	23	7·66	25	5·93	19
Trichinopoly - - -	1·51	10	10·03	29	5·49	19	3·70	13
Madura - - - -	1·44	9	5·35	16	2·10	7	2·33	7
Tinnevelly - -	1·06	8	3·49	13	5·02	20	3·70	13
Coimbatore - - -	0·80	6	1·40	6	3·64	13	3·41	12
Nilgiris - - - -	0·62	6	2·97	17	2·87	17	1·48	8
Salem - - - -	1·21	8	3·94	15	5·83	20	4·82	15
South Canara - - -	1·43	10	—	—	—	—	2·79	12
Malabar - - -	1·35	10	—	—	—	—	4·15	17

The Board do not think that it is possible to state definitely what rise in price would indicate the approach of alarming scarcity; but any rise in excess of what is shown above as an ordinary fluctuation would afford cause for anxiety if the season were also known to have been unfavourable.

It is only as regards two famines that sufficient information is available to permit of the effect on prices being traced in detail. The statement given below shows the nature of the rise in certain typical districts :—

—	Rice.		Ragi.		Cumbu.			Cholum.	
	Trichinopoly.	Madras.	Ganjam.	Salem.	Vizagapatam.	Cuddapah.	Tinnevelly.	Kurnool.	Bellary.
1866.									
January - -	11·2	12·3	13·3	18·2	18·5	14·1	13·8	14·3	12·1
February -	10·4	11·0	13·5	16·8	13·7	13·7	16·0	13·8	12·2
March - -	10·6	11·0	14·2	16·7	17·8	13·9	16·0	14·5	10·2
April - -	10·7	11·3	14·1	16·7	17·9	13·2	14·8	14·0	11·2
May - -	10·7	11·1	12·8	16·6	17·6	13·7	14·7	13·6	—
June - -	10·3	10·4	10·2	13·5	27·1	13·2	13·4	12·9	8·8
July - -	8·4	9·2	10·5	11·6	15·1	12·3	12·4	9·9	6·8
August - -	8·1	8·7	11·5	10·3	16·1	10·2	11·6	9·0	6·4
September - -	6·9	7·7	12·0	9·1	20·3	9·2	10·3	8·5	5·8
October - -	6·5	8·0	16·7	11·0	23·1	11·6	10·3	10·8	7·8
November - -	6·5	7·2	21·4	12·3	24·3	14·6	10·1	13·5	9·9
December - -	7·0	7·2	22·7	13·0	33·8	14·7	11·6	14·1	12·5
1876.									
June - -	14·5	15·2	35·8	22·9	30·0	24·3	22·7	26·8	24·6
July - -	12·8	15·4	35·6	20·7	29·7	21·1	20·3	24·4	22·6
August - -	12·8	14·1	32·9	20·1	30·8	19·7	19·8	21·5	20·5
September - -	12·8	13·9	37·6	18·2	33·4	17·0	19·9	17·7	15·5
October - -	13·0	11·7	39·5	14·6	29·5	11·5	19·9	9·3	10·4
November - -	9·1	9·8	27·9	11·3	23·8	9·0	15·9	7·9	7·5
December - -	7·0	7·8	16·9	8·7	18·4	7·5	11·4	7·0	7·5

AP.I. QN.16.

MYSORE.

r. Lacey.

MYSORE.

Mr. Lacey, Mysore.—The normal rate of prices is Rs. 3 per "Palla" of 100 seers of ragi, jola, gram, and paddy at harvest time, and rises to Rs. 4 or Rs. 5 at other times of the year. In 1872 gram was obtainable in the Mysore district, where I was located at the time, for Rs. 2 per palla, and could not obtain purchasers, at that rate gram being so abundant that several ryots resigned their lands, as their cultivation did not pay. This led to speculators purchasing and exporting gram, so that the market reached its normal state the next year. No distress need be apprehended so long as the price of grain did not exceed Rs. 5 per "Palla" of 100 seers; but distress among the poorest classes commences when prices rise above that limit, and when it reaches Rs. 10 per "Palla" we may safely say that we have come to the beginning of a famine.

AJPUTANA.

. Beynon.

RAJPUTANA.

Colonel Beynon, Jaipur.—The normal rate of prices of each of the chief staples of food-grains at the principal centres of the State are, wheat 16 to 17 seers (80 tolas per seer) per rupee, barley 21 to 22 seers, and bajra 19 to 20 seers.

At harvest time these grains are usually (if the out-turn is an average one) each about 20 per cent. cheaper.

A rise in the prices of these grains to 11, 15, and 13 seers per rupee respectively, would indicate the approach of alarming scarcity.

During the severe scarcity in 1868–69 the highest selling rates of wheat, barley, and bajra were 6¾, 8 and 7¼ seers per rupee respectively, and in the famine just past, when the distress was of less severity and duration, 9, 11, and 7 seers were the highest prices reached.

On both occasions the rise in prices was gradual, the advance continuing more or less uniform in respect to the different staples until the more critical and pinching condition was reached, when this uniformity ceased, and, as will be observed from the comparative rates above quoted, the prices of all staples became, as the distress waxed acute, more and more equalised, with the exception of bajra in 1877, the price of which was especially high owing to the great demand for this particular staple in our own provinces in the North-West, to which large quantities found their way from this part of the country about the sowing season of that year (June and July).

CENTRAL INDIA.

r. Wingate.

CENTRAL INDIA.

	Normal prices Seers per Rupee.	Harvest prices Seers per Rupee.	Scarcity prices. Seers per Rupee.
Bhopal -	25	30	12
Baghelkhand—			
Rice -	15 to 20	¼ cheaper	½ the ordinary quantity.
Urd and Masur	25 to 30		
Wheat Bajra	30		
Gram, Arhar Barley, Juar	35 to 40		
Peas, Kodoo and Saman -	40 to 50		

N.B.—Prices are much cheaper in the more inaccessible parts.

Western Malwa.—			
Jowar -	15 to 19	19 to 24	12

Manpur.—"The ordinary variation between the prices of food grains at harvest and other times amounts to from 10 to 15 per cent. Looking to past times, wheat selling below 8 and jowar below 10 seers per rupee would indicate the approach of alarming scarcity. The rise and fall in prices are generally gradual and affect all the food grains, but not quite uniformly, as will appear from the following statement of prices in 1873 and 1877.

Month.	1873.					1877.				
	Wheat per Rupee.	Gram per Rupee.	Jowari per Rupee.	Mukka per Rupee.	Dall per Rupee.	Wheat per Rupee.	Gram per Rupee.	Jowari per Rupee.	Mukka per Rupee.	Dall per Rupee.
March -	13¾	15½	21	23	10	15	15½	18½	19	10½
April -	14	15	21	23	10	15¼	15½	18½	19	10½
May -	13½	14	21	24	10	14	18½	17½	20½	10
June -	13	13	19	21	10	13¾	16¾	16¾	18½	10
July -	13¼	13½	19½	20½	10	13	16	15½	17¾	9
August -	13½	14	19	20½	10¼	12¼	15½	14	16½	9
September	13¼	13	18¼	24½	11	11¼	13	13	18	8
October -	14	13	24½	35	11	11½	13¼	13	19½	8
November	14½	13	26	38	11	12	14½	18	21½	9¼
December	15	14	26	38	12	13½	16½	19½	23½	12
January -	15	14	28	38	12¼	12½	16½	17	18	10½
February -	15	15	29	39	13	11½	14	14½	14½	9

The first was a year of fall and the second that of rise. But the fall in coarser grains was greater and more marked in the first year than the rise in the same grains in the latter compared to the richer grains."

HYDERABAD.

CHAP. I. QN. 16.

HYDERABAD.

Moulvi Mahdi Ali.

The normal rate of prices of each of the cheap staples of food in some districts is given below in seers (of 80 tolas) per one *Hali Sicca* rupee.

NAME OF DISTRICT.	JOWARI.		BAJRI.		WHEAT.		COARSE RICE.	
	Normal value.	Prices at Harvest time.	Normal value.	Prices at Harvest time.	Normal value.	Prices at Harvest time.	Normal value.	Prices at Harvest time.
Aurangabad	25	30	25	30	15	20	—	—
Parbhaini	26	31	26	31	18	22	—	—
Gulbarga	22	26	24	28	12	15	12	15
Medak	18	22	—	—	12	15	16	20
Nagar-Karnul	25	30	28	32	12	15	17	20
Haidarabad	18	22	—	—	10	12	10	12

The approach of alarming scarcity would be indicated by a rise in prices of over 50 per cent.

In past times of severe scarcity, so far as is known, prices have not risen very suddenly, but by gradual degrees. But when prices once begin to rise, they do so almost every day, until scarcity prices are reached. All staples are equally affected. The rise in prices of the cheapest staples of food tends to almost equalise the prices of all staples. Jowari and rice, the normal prices of which widely differed in days of plenty, sold for very nearly the same rate during the famine of 1876. The market rate of jowari and rice then was about four seers per rupee.

The following tabular statement showing the import and export of goods in 1286 Fasli will give an idea of the state of trade in His Highness's dominions.

Number.	Names of Articles.	Imports.				Exports.			
		Weight in Maunds.	Value.	Customs Duty.	Percentage ad valorem.	Weight in Maunds.	Value.	Customs Duty.	Percentage ad valorem.
1	2	3	4	5	6	7	8	9	10
			Rs.	Rs.			Rs.	Rs.	
1	Grains	25,06,153	1,67,07,685	—	—	34,42,734	2,29,51,556	5,73,789	2·5
2	Fruits	—	14,89,691	65,308	4·37	—	3,89,577	7,767	2
3	Oil seeds and oils	9,603	1,12,760	4,534	4	7,69,560	55,44,284	2,32,706	4·2
4	Silk and cotton stuffs	—	71,99,867	3,59,953	5	—	9,68,732	48,436	5
5	Cotton	2,799	55,948	2,333	4	6,61,941	1,32,38,898	5,51,621	4·37
6	Cotton seeds, &c.	—	7,180	258	3·56	—	2,01,943	7,480	3·75
7	Opium	348	3,85,883	14,035	3·8	3	4,726	189	3·9
8	Indigo	417	1,06,841	4,477	4·18	2,445	5,24,530	17,341	3·3
9	Scents and drugs	—	45,54,105	1,22,038	2·7	—	19,24,329	65,572	3·4
10	Timber	—	86,763	2,747	3·2	—	4,12,371	12,509	3
11	English spirits, wines, &c.	—	1,32,081	6,604	4·8	—	—	—	—
12	Sugar, jagerry, &c.	62,877	10,94,374	42,518	3·9	68,544	6,46,830	22,997	3·1
13	Paper, &c.	—	1,39,643	5,546	3·97	—	1,49,729	9,222	6·1
14	Live stock	—	6,87,848	33,410	4·86	—	19,11,871	90,158	4·7
15	Minerals	—	28,89,688	99,941	3·46	—	2,07,088	7,063	3·36
16	Silk	—	11,81,700	22,698	1·9	—	5,044	102	2·02
17	Miscellaneous	—	33,50,885	1,67,512	5	—	2,39,433	11,972	5
	Total	—	4,01,82,942	9,53,912	2·37	—	4,93,20,941	16,58,924	3·37
18	Muhuwa flower	—	2,73,942	35,351	12·9	—	79,481	11,738	14·8
19	Salt	11,91,672	58,43,494	7,75,304	13·2	—	—	—	—
	Grand total	—	4,63,00,378	17,64,567	3·81	—	4,94,00,422	16,70,662	3·38

hap.I.Qn.17.

CHAPTER I.—QUESTION 17.

What is the state of your Province as to the activity of commerce? Has it an energetic and enterprising trading class? Do any of the districts subsist mainly on their own resources, and export and import little? Or is there an active and constant ebb and flow of trade?

Punjab.

PUNJAB.

Major Wace.

There is no part of the province which does not possess an active and enterprising trading class; and throughout the province there is an active and constant ebb and flow of trade. The trading classes are not confined to the larger towns, but are to be found in almost every village in the province. There is no district shut up to its own resources, even the mountainous parts of Hazára and Kángra possessing their local trade. Some idea of the character of the internal trade of the province will be formed from the appended account of the trade of the 19 chief trading towns, which is extracted from the Trade Report for 1873–74.

Internal trade.—The amount of the internal trade of the Punjab, as shown by the traffic carried on at the principal trading centres, fell from 684 lakhs of rupees in 1872–73 to 568 lakhs in 1873–74. In 1871–72 it was 926 lakhs. It is not likely that these returns give and adequate representation of the state of trade in the province. They take no account of the trade of any of the towns except the 19 which have been selected to give some idea of the transactions. And even in the case of these 19, no articles are entered which skirt the towns in transit without paying octroi duty, nor of those which are conveyed by rail without entering them. Still, as regards these 19 towns, they convey some idea of their internal transactions, and they must accordingly be accepted as demonstrating a considerable decline in such transactions. This decline has been accounted for in some cases by general trade having been sacrificed to demand for grain for the famine in Bengal, the effect of which is only partially shown in the returns.

In the case of the towns of the Gurgaon and Hissar districts, the trade is said to have been diverted by the opening of the Rájputána State Railway.

The relative importance of the 19 towns for the last four years is shown by the annexed table:—

Order of importance.

——	1870–71.	1871–72.	1872–73.	1873–74.
Delhi - -	2	2	1	1
Rewári - -	16	15	14	14
Hissar - - -	13	13	15	13
Bhiwáni - -	4	4	3	3
Umballa - -	5	5	5	8
Ludhiána - -	7	7	9	7
Simla - - -	17	18	18	18
Jullundur - -	9	11	12	11
Kángra - -	12	10	8	9
Amritsar - -	3	3	2	2
Lahore - -	6	9	7	5
Ferozepore - -	11	6	11	12
Jhelum - -	19	17	19	17
Pind Dádan Khan -	15	16	16	15
Gujrát - -	18	19	17	19
Mooltan - -	1	1	4	4
Jhang - - -	17	12	13	16
Dera Ismail Khan -	10	14	6	6
Peshávar - -	8	8	10	10

The most notable descents in this scale are Umballa, Ferozepore, Mooltan, Jhang, Peshávar; while Lahore and Dera Ismail Khan show the greatest rise.

The internal trade of Umballa fell from 56 lakhs of rupees in 1872–73 to 21 lakhs in 1873–74. The Deputy Commissioner can only account for this remarkable decrease by supposing that the merchants of the city confined their speculations exclusively to dealings in grain on account of the Bengal demand. The greater portion of the grain collected at Umballa was despatched by rail without entering the town, to avoid all chance of dispute with the octroi contractors.

The decrease in Ferozepore is from 18 lakhs to 14 lakhs, but in 1871–72 the value of the trade reached 40 lakhs. No explanation has been given, but the returns of the bridge traffic, a few miles from Ferozepore, show an increase from 27 lakhs in 1871–72 to 41 lakhs in 1872–73, and 75 lakhs in 1873–74, so the decrease does not appear to be substantiated. The goods which pass the bridge, however, are to a great extent conveyed down the river by boat.

The falling off in the Mooltan trade was alluded to in last year's report. There has been a further decrease this year from 58 lakhs to 51 lakhs. A special report, received from the Commissioner of Mooltan, shows that this decrease is partly real, partly nominal. The cotton and indigo which used to come from Muzaffargarh and Dera Ghází Khan to Mooltan for local sale before export, is now exported direct to Karáchi. Boat-building is on the increase in these two districts, and the traders find it more profitable to locate themselves across the river and export direct.

On the other hand, octroi duty on cotton and indigo has been abolished in Mooltan, and the contractors are not interested in recording the import and export of these staples. The traffic is therefore under-estimated.

In Jhang the decrease has been from 15 lakhs in 1872–73 to 10 lakhs in 1873–74. The falling off is due to dullness in the Povindah trade, owing, it is said, to a glut in the Kábul market.

The falling off of the Peshávar trade is under investigation, special inquiry having been made by Government. Since last year there has been a further decrease from 22 lakhs to 18 lakhs, which is accounted for by the exclusion from the returns of this year of transit goods entered in the bonded warehouse, which were shown in the returns for 1872–73.

The Lahore trade increased from 29 lakhs in 1872–73 to 36 lakhs in 1873–74. The causes assigned are—improved registration, and the active demand for grain resulting from the Bengal famine.

Dera Ismail Khan forms an emporium for the Povindah trade, which passes on to Okárá, and is conveyed thence by rail. The rise in this trade was noticed last year. There has been a further increase this year from 30 lakhs to 33 lakhs of rupees. The construction of a bridge of boats over the Indus at Dera Ismail Khan during the year is an event worthy of being chronicled. The facilities of communication between Bhakkar and the Deraját thus afforded are great, and much appreciated by the people of the country and the Povindahs.

Chap.I. Qn. 1

North-Western Provinces.

Mr. Buck.

NORTH-WESTERN PROVINCES.

The best data on which an account of the trade of these provinces can be based are the statistics of railways, road, river, and canal traffic, collected under the administration of the local Department of Agriculture and Commerce. An account of the method in which statistics have been collected will be found in the appendix to reply 7, Part II. A., as well as in the trade reports herewith appended.

It must be understood that the period which the reports cover consists of 12 months from 1st April 1877 to 31st March 1878, but that railway statistics only commenced in October 1877. The report therefore only embraces six months of railway statistics, but since the submission of the report, new statistics for another six months have come in, which have been utilised in the following note.

For trade registration purposes, the railways of these provinces have been divided into blocks which correspond nearly with the administrative division of the province under Commissioners, and which are shown in the sketch map appended.

In the trade report for 1877–78, the statistics which had been collected were arranged under the following heads:—

External Trade.

(*a.*)—Foreign, *i.e.*, trade between the North-Western Provinces and Oudh and countries external to British India, *e.g.*, Nepal and Tibet.

(*b.*)—British or provincial, *i.e.*, trade between the North-Western Provinces and Oudh and other British provinces or protected Native States within British India.

(*c.*)—Trade between the North-Western Provinces and Oudh and the ports of Calcutta and Bombay.

Internal Trade.

(*a.*)—Trade within provincial boundaries not crossing the frontier.

(*b.*)—Town or municipal trade.

The *rationale* of the above divisions was to arrange information as to the amount and character of trade passing along different routes from one part to another of the province or from this province to other provinces, and required therefore geographical arrangement of traffic along principal routes. The present note, however, will deal more directly with the resources and needs of the province as regards principal commodities. So that while in the published report trade is primarily divided according to routes, in the present note the primary division will be according to commodities.

The most important factor in the distribution of trade by commodities is the character of the produce of each portion of the province. It will be useful at this place to refer to the general description which has been given of the physical features of this part of India in the reply to query 3, where the different circumstances of climate, soil, irrigation, &c., of the various sections of the province have been noticed. It was found convenient to divide the province into four belts (parallel with the Himalayas), of which the atmospheric and physical conditions are sufficiently diverse to justify demarcation, and it was noticed that the belts thus demarcated are crossed at right angles by a gradual change from dryness and sand to moisture and loam.

It was further noticed that the same circumstances which formed the basis of the distinction between the different geographical sections of the province have led to important differences in the class of crops grown in each. It will now be shown how this diversity of produce has been the chief factor in regulating the character of provincial traffic.

It is to be regretted that the only statistics with any pretence to completeness which are available are those for a year in which drought caused abnormal changes in the quantity of produce and in the direction of the movements of grain. At the same time it may be explained that much of the information which is now given is based on independent inquiry as well as on the statistics of the report.

The chief articles of trade produced in these provinces, of which there is a surplus for export from the localities of their production to other provinces, countries, or localities, are cotton (including cotton manufactures), indigo, wheat, other edible grains, oilseeds, sugar, and timber. Other articles of trade, such as hides, ghi, tobacco, &c., are of less importance, and may be classed together under the head of subordinate articles of trade.

On the other hand, the chief articles which the province or portions of the province need, and which are brought from outside, are European yarn and cotton cloth, iron and hardware, and salt. Of the chief articles supplied by the province some are produced, as above explained, in one part and some in another part of the provincial territory. There is therefore an internal ebb and flow in articles of provincial production in addition to the current of trade which cross the boundary.

Before proceeding, however, to notice in separate detail the trade in each of the "chief commodities," it may be convenient to give a very short description of the principal requirements of the provincial population. There are in the North-Western Provinces and Oudh about 42 millions of inhabitants whose individual wants are (with the exception of a very small per-centage) almost identical—even rich men living in very little better style than the lower classes. The wants of one family provide, therefore, an index to the requirements of all.

Food.—The ordinary food of a family consists of edible grains, salt, vegetables, spices, sugar, oil, milk, and "ghi," the product of milk, of which the first two are absolute necessaries and the last two luxuries.

Clothing.—The clothing of the family consists mainly of cotton cloth, sometimes supplemented by blankets of wool, with leather shoes.

Houses.—The houses of villagers and the poorer town classes are made of mud, building with burnt bricks being almost entirely confined to towns; they are roofed and supported with wooden beams and doorways and thatched with local produce.

Utensils.—Household utensils are a few brass, copper, and iron pots and dishes, clay vessels, and stone flour mills.

Fuel is cow-dung supplemented by wood.

Lighting is obtained by oil, but, as a rule, natives use little lighting.

Tools.—Of agricultural implements, ploughs, well gear, mattocks, and trowels, are made of wood and iron; sugar mills of wood or stone, ropes of local fibres, and irrigation bags of leather.

Luxuries (not being food) are tobacco, fine cloth, and jewellery. Taking, therefore, first those articles of which a comparatively large quantity is required by each family, and which therefore (on account of the large multiplier of 42 millions) must be the chief commodities of supply and demand, we find that they are—

Edible grains.
Oil and oil-seeds.
Salt.
Sugar.

Cotton.
Iron.
Wood.
Stone.

Edible grains and oil-seeds are, as a rule, produced locally in sufficient quantities for consumption, the surplus being exported, but occasionally a local deficit compels an indraught to one part of the province or another.

There is a steady flow of the remaining articles of the list from the localities where they are produced to the places where they are not produced.

Other articles noticed in the earlier paragraphs are either provided locally or are so small in weight as not to be worth classing as chief commodities, viz., milk, vegetables, spices, wool, tobacco, jewellery.

Passing now from the wants of the community as a congeries of individuals to the wants of the community

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NORTH-WESTERN PROVINCES.

Mr. Buck.

as a national body, we find that they are stone, iron, timber, bricks, and mortar, all of which are required for public buildings, bridges, railroads, &c., but of which the last two are usually provided at the place where they are wanted, while the first three have been already mentioned. The list already sketched need not, therefore, be amplified, and the chief commodities required by the province, whether produced locally or imported, are, therefore:—

Cotton and cotton cloth.
Edible grains.
Iron and hardware.
Salt.
Oil-seeds.
Stone.
Sugar.
Timber.

The above articles, representing the chief wants of the people of India, are naturally the chief items in the internal trade of the country. But to these must be added some other articles, the production of which is stimulated by a demand outside Indian limits, whither they are exported viâ the ports of Calcutta and Bombay. The chief of these are wheat, indigo, and opium; wheat is already included under "edible grains," and indigo and opium will be added to the list.

The order in which these commodities will be noticed is that adopted in the classified list drawn up for trade registration purposes under the orders of the Government of India.

Cotton and Cotton Cloth.—Cotton is most successfully cultivated on the reddish light soil occurring in the western districts of these provinces (and on the banks of the Jumna), and on the black soil known as "már" or "cotton soil." In describing the belts into which the area of the provinces has been subdivided, it was noticed that red sandy soil was most prevalent in the north-westerly districts towards the Panjáb. In the sub-Himalayan and Rohilkhand belts, as well as in the Doab belt, it appears to be restricted to the western extremity, beginning to disappear in the Sháhjahánpur district, north of the Ganges, and in the Cawnpore district, south of this river.

Már soil is the rich black earth, supposed by some to be of peat formation, found almost exclusively in tracts south of the Jumna, and is known as the "cotton soil" of Central India.

The absence of cotton cultivation in districts of these provinces where it is not grown is probably due to unsuitability of climate as well as of soil, since it does not appear to thrive in damp localities. The general result is, that, owing to conditions of soil and climate, the cotton area is not precisely coterminous with the belt areas.

The cotton area may be divided into three tracts under each of which are given figures showing the area of cotton per head of population for certain typical districts.

I. *First tract.*— Western districts of Rohilkhand (Bijnor, Moradabad, and Budaun). East of Moradabad and Budaun cotton cultivation shows a marked decrease; thus the area per head is, roughly speaking, in Bijnor ·05 of an acre, while in Bareilly it is only ·017, and in Sháhjahánpur ·01. Further east still, in Oudh and the Benares division, cotton cultivation almost disappears. In the Gonda district barely ·001 of an acre is the average per head; and in Gorakhpur ·003, while in Rai Bareli the average is as low as ·0001.

II. *Second tract.*—The western districts of the Ganges-Jumna Doab.

In this tract the area of cotton cultivation reaches its maximum in the Aligarh district, where it averages per head ·1 of an acre. Going north-west of Aligarh there is a gradual decrease, the average for Bulandshahr being ·04, and for Meerut ·03. South-east of Aligarh there is a corresponding decrease, the average for Etah being ·05, for Etáwah ·07, and for Farukhabad ·02. In Cawnpore and Fatehpur there is an increase, the average being ·06 in both. The increase is probably due to the cultivation on the high land bordering on the Jumna, and this would also appear the reason for the excess exhibited by Etáwah over the neighbouring district of Etah.

Cotton cultivation decreases below Fatehpur, the average for Allahabad being ·01.

III. *Third tract.*—The trans-Jumna belt.

This is the tract in which black soil occurs.

There is also the light red soil in the region of the Jumna in the Muttra, Agra, and other districts near that river. The average for the Agra district is ·1, the same as that of Aligarh. The area increases to the east till in Jalaun it is ·11, and Bánda ·17, in both of which districts black cotton soil is found.

The area of cotton cultivation, then, may be described as an irregular belt, which, starting from the districts of Budaun, Moradabad, and Bijnor, sweeps round in a curve comprising all the Ganges-Jumna Doab districts to which the trans-Jumna region is appended as a fringe.

The weaving of cotton fabrics is somewhat restricted to the tracts in which the raw cotton is produced. The industry is not much centralised in particular towns or villages, except in the case of a few special kinds of cloth.

The available statistics of the internal trade of cotton bear out the deductions which have been made from the average area of cotton cultivation per head in the different portions of the provinces. Between the districts of Rohilkhand and those of the Meerut division, the trade in cotton and cotton-goods is not very considerable. This is as might be expected, since the Bijnor, Moradabad, and Budaun districts would appear to produce more than is needed for their own consumption, and any deficiency in the other Rohilkhand districts would be more easily supplied from them than from other districts across the Ganges. In the year 1877–78, however, raw cotton was exported by road from the Doab to Rohilkhand to the net amount of 16,939 maunds, while Rohilkhand sent 21,345 maunds (net) of cotton goods to the Doab. The failure of rain in that year, which was more severely felt in Rohilkhand than in the Doab, was probably the cause of any cotton being exported at all. And it is noticeable that about three-quarters of the amount exported went towards the Budaun and Sháhjahánpur districts, Bijnor and Moradabad only taking one-fourth. The export of cotton goods to the Doab is a good indication of the general character of the trade, since these were manufactured from the cotton crop of the previous year, which was of a normal character. Most of the cotton goods (17,064 maunds out of 21,345 maunds) came from the Bijnor district, which, as we have seen before, took least of the raw cotton which crossed the Ganges into Rohilkhand. We are, therefore, justified in assuming that in ordinary years cotton and cotton goods are exported from the Bijnor and Moradabad districts, while they are, if anything, imported by the more easterly districts of Rohilkhand. The import of cotton into Rohilkhand from the Doab is, however, trifling when compared with that into Oudh. It was noticed that in the sub-Himalayan and penultimate belts cotton cultivation becomes scarcer and scarcer going eastwards. Accordingly, in the year 1876–77 (a normal year) the net exports from the Doab to Oudh by road alone amounted to 168,772 maunds of raw cotton, and 12,362 maunds of cotton goods, besides which 22,363 maunds of European cotton goods (valued at Rs. 23,08,466) were exported by road. Most of the exports were from the city of Cawnpore, through which passes the greater part of the cotton destined for Oudh and the trans-Gogra districts of the Benares division. The chief distributing mart in Oudh is Fyzabad, which receives cotton from Cawnpore by road and rail, and from Agra by rail.

From the trans-Jumna districts cotton crosses into the Doab in large quantities. The trade chiefly centres in Cawnpore, though a certain quantity is consigned to Allahabad, and some is sent in boats down the Jumna. In the year 1876–77 the city of Cawnpore received from Bundelkhand 79,124 maunds of raw cotton as well as cotton goods to the value of Rs. 3,12,448. In the year 1877, 38,242 maunds crossed the Jumna going towards Allahabad, and in the same year nearly 22,000 maunds were despatched by boats down the Jumna. Bundelkhand is well known for its cotton manufactures, those of Mau-Ránípur being especially notable.

The internal trade in cotton which passes between the other divisions of these provinces, will be seen from the appended returns of railway traffic for the year ending 30th September 1878. It will be understood that the trade indicated by these figures is exclusive of that with tracts lying outside the provinces, and with the ports of Calcutta and Bombay, except in cases where the cotton destined for export is first consigned to an intermediate mart, where it is collected for despatch beyond the limits of the provinces.

The appended statement shows the trade in raw cotton which passed by rail between each of the "blocks" in these provinces during the year ending September 30th, 1878. In "exports" only that cotton is included which was exported to other blocks within the provinces, and similarly in "imports" only that imported from the blocks within the provinces :—

Railway Stations within limits of							
Meerut Division.		Agra Division.		Allahabad Division.		Benares Division.	
Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
2,953	7,882	7,702	4,432	5,783	5,221	7,029	171

Railway Stations on			
Oudh and Rohilkhand Railway.		Muttra-Háthras Railway.	
Imports.	Exports.	Imports.	Exports.
3,948	9,841	482	956

On these figures the only blocks the net exports of which are considerable are Meerut and the Oudh and Rohilkhand Railway. Agra, which has been mentioned as one of the chief localities for cotton cultivation, actually imported 3,270 maunds more than it exported. The large imports of Benares will have been expected, since but little cotton is grown there. It is noticeable, however, that the imports into the Meerut and Agra blocks (which may be considered abnormal) nearly all took place between the months of October 1877 and April 1878, when the local cotton crops had almost entirely failed from want of rain.

Some judgment as to the surplus cotton produce of each block may also be formed from the exports to Calcutta during the same year. These were as follows:—

From Railway Stations within limits of			
Meerut Division.	Agra Division.	Allahabad Division.	Benares Division.
5,661	14,363	17,724	7,492

From Railway Stations on the	
Oudh and Rohilkhand Railway.	Muttra-Háthras Railway.
4,664	238

The total exports to Calcutta amount to 50,162 maunds. Those to Bombay are insignificant (915 maunds). The exports from the Allahabad division are almost entirely from the city of Cawnpore, which is included in it. Those from Benares are chiefly from Mirzapur, and consist not in locally grown produce, but in cotton collected there from other parts of the provinces. Before the extension of the East Indian Railway to Allahabad, Mirzapur was the chief cotton mart in Upper India, and though now most of its former trade has left it, yet it still retains a portion of the forwarding trade from the Rewah States.

It now only remains to notice the cotton trade which these provinces transact with neighbouring states or provinces. This may be summarised as follows, only net imports or exports being shown in each case. The figures for railway traffic are for the year ending September 30th, 1878, for road and river traffic for the year ending March 31st, 1877 :—

From the under-mentioned provinces and states cotton was imported into the North-Western Provinces and Oudh.

Provinces and States.	Amount of net imports.		
	By Rail.	By Road.	Total.
	Mds.	Mds.	Mds.
Panjáb - - -	5,101	39,965	45,066
Rajputana - -	1,190	32,455	33,645
Bundelkhand and Rewah -	—	6,723	6,723
Central Provinces -	1,03,237	635	1,03,872
Bombay Presidency -	1,703	—	1,703
Total imports -	—	—	1,91,009

Cotton, on the other hand, was exported to Bengal and to the country of Nepal.

The net exports to Bengal were—by rail, 29,768 maunds, and by road and river, 19,196 maunds; total 48,964 maunds.

The net exports to Nepal were only 407 maunds.

These provinces, therefore, on the whole, imported cotton, the net imports being 90,561 maunds.

European Cotton Goods.—These are imported into these provinces chiefly viâ Calcutta, Bombay taking little or no share in the trade. In the year ending 30th September 1878, the total imports from Calcutta aggregated 1,91,428 maunds, while those from Bombay only amounted to 48,249 maunds. As might be expected, they all come by rail, their value prohibiting their exposure to the risks of road or water conveyance. The imports destined for consumption in these provinces are, to a great extent, engrossed by the three towns of Gházipur, Cawnpore, and Delhi (the last, although in the Panjáb, being intimately connected in commerce with the North-Western Provinces), whence they are distributed (1) from Gházipur to the districts of the Benares division; (2) from Cawnpore to those of the lower and middle Doab as well as to the greater part of Oudh; and (3) from Delhi to the districts of the Meerut and Rohilkhand divisions. The railway returns for the year ending 30th September 1878 show this very distinctly. Below is appended an abstract giving the total imports from Calcutta to the railway stations in each of the divisions of these provinces :—

Benares.	Allahabad.	Agra.	Meerut.
59,670	96,427	12,878	12,557

Oudh and Rohilkhand Railway.
9,896.

Nearly all that consigned to the Benares and Allahabad blocks went to the towns of Gházipur and Cawnpore respectively. It will be seen that the amount taken direct from Calcutta by the Agra, Meerut, and Oudh blocks was comparatively small; and as a fact they receive most of their imports second hand from Cawnpore or Delhi.

From the three centres of trade the cotton goods are passed on either by railway, road, or river. Thus in ten months of the year 1876–77, 8,496 maunds crossed the Gogra river at Barhal on their way from Gházipur to Gorakhpur and Basti; while in the year 1877–78 the exports to Nepal viâ the Basti and Gorakhpur districts, amounted to 2,888 maunds, most of which had been consigned from Gházipur. The course of cotton goods can be traced southwards towards Rewah, to which in 1877–78, 2,742 maunds were exported. The statistics of railway-borne traffic show that the amount re-exported from Gházipur by rail is but small.

From Cawnpore European cotton goods are re-exported by railway as well as by road. During the year ending September 30th, 1878, 5,000 maunds were consigned from the Allahabad block (chiefly the city of Cawnpore) to stations in the Agra block. The appended statements show the amount re-exported by road during the year 1876–77 to Bundelkhand, Oudh, up country, and down country, that is to say, in all four directions :—

Bundelkhand - - -	10,648
Oudh - - - -	11,238
Up country, towards Agra -	1,939
Down country, towards Allahabad -	7,943

Of the share taken by Bundelkhand, 216 maunds were passed on to the native states of Chatarpur, &c., and from Oudh 1,282 maunds were passed on into Nepalese territory.

We have as yet no satisfactory statistics showing the amount of European cotton goods re-exported by rail from* Delhi to these provinces. In the year 1877–78, 2,833 maunds were exported by road from Delhi across the Jumna bridge into the Meerut division, while the exports by road towards Muttra were only 128 maunds. From the Meerut division European cotton goods find their way across the Ganges into Rohilkhand, and thence to Nepal and the hill districts. In the year 1877–78 the amount thus exported to Rohilkhand came to 6,008 maunds, of which 1,615 maunds were passed on to Kumaun and Garhwál.

The various threads of the trade in European cotton goods have thus been traced as they ramify throughout the country from the three centres of Delhi, Cawnpore, and Gházipur, each of which towns draws its supplies direct from the port of Calcutta.

Indigo.—The indigo plant is cultivated to a greater or less extent throughout these provinces, though its cultivation is most extended in those districts which possess the advantages of canal irrigation. It is somewhat extensively grown in the Benares division, though not so much so as in the neighbouring Bengal province of Tirhoot. Figures showing the per-centage of indigo area to total cultivated area are given for some typical districts, from which some idea can be formed as to the comparative extent of its cultivation in the different portions of the provinces.

Meerut Division.	Rohilkhand Division.	Agra Division.
Meerut - - ·57 Aligarh - 4·8	Budaun - ·13	Agra - - ·77 Etáwah - 3·62 Cawnpore - 3·84
Allahabad Division.	**Benares Division.**	**Oudh.**
Allahabad - ·03 Bánda - - ·01	Gorakhpur - ·71	Gonda - ·01 Partabgarh - ·47

It is noticeable that indigo cultivation, like that of cotton, reaches its maximum in the Aligarh district, above which it rapidly decreases; in the Sahéranpur district it is very rare. Below Aligarh it keeps very much to those districts which lie towards the centre of the Ganges-Jumna Doab, along the line of the Ganges Canal. In districts off this line, *e.g.*, Agra, there is very little indigo grown. The Ganges Canal ends at Cawnpore, and in the portion of the Doab below Cawnpore indigo cultivation is but little carried on, as is also the case in the district of Bundelkhand, in which there is very little irrigation. Although indigo cultivation would thus seem to follow on an extensive supply of water, yet north of the Ganges, in the damp climate of Oudh and Rohilkhand, there is comparatively little indigo grown. Beyond the limits of the Ganges Canal its cultivation seems to centre in the Benares division.

Without going into details, which would be out of place in this note, it may be stated that there are two methods of preparing indigo cake practised in these provinces, differing in the treatment of the dye when it has been extracted from the plant leaves. According to one method this is boiled before being made up into cakes, while according to the other it is merely strained and pressed. The former is practised in indigo factories owned or managed by Europeans, and is the only way in which indigo cake destined for export to Calcutta is prepared. In the latter way is made a great deal of the indigo cake manufactured for consumption in the country.

The trade in indigo is only important in respect to that which is exported to Calcutta, trade in indigo destined for consumption in this country being of scarcely more interest than that in the various other dyes which are locally produced or utilised. Thus in the exports from these provinces to the Panjáb safflower figures as 18,501 maunds, while indigo is only 1,018 maunds. It is then solely as an export to the port of Calcutta that indigo is deserving of notice, and the proportion in which the different portions of the provinces contribute to this may be judged from the subjoined table, which shows the amount of indigo cake exported by rail to Calcutta from each block during the year ending September 30th, 1878 :—

From Stations within the limits of the				From Stations on the		Total.
Meerut Division.	Agra Division.	Allahabad Division.	Benares Division.	Oudh and Rohilkhand Railway.	Muttra-Háthras Railway.	
19,246	10,661	7,046	5,681	3,716	371	46,121

These figures bear out the deductions, which were based on the per-centage of indigo cultivation, in making the Meerut and Agra divisions by far the largest exporting blocks.

So far as European enterprise is concerned, it seems admitted that indigo manufacture in these provinces has very much declined in the last 15 years, and this is evidenced by the number of factories which have been either abandoned altogether or sold for the most trifling sums. This may be due in part to the low price which indigo from these provinces now fetches in the Calcutta market, and in part to the competition of native manufacturers. In the last Calcutta price list, dated January 24th, 1878, it is noticeable that prices for Aligarh, Bulandshahr, and Mainpuri indigo vary between Rs. 172 and Rs. 132 8 0 per maund, the average price obtained being about Rs. 150. The prices rise as one goes down country, Benares indigo fetching Rs. 200, and Tirhoot averaging from Rs. 233 to Rs. 176. It is said that the indigo obtained from plant irrigated by canal water is inferior in quality as well as less in quantity than that from land irrigated from wells, though whether this has much connexion with the low prices of indigo from the canal irrigated districts of the Meerut and Agra Divisions may be a matter of doubt. At these low prices indigo cannot be manufactured at any great profit under European management, though native landholders, it is admitted, can do so, their position enabling them to obtain both labour and plant from their own villagers at far lower rates than European planters can bargain for.

In connexion with indigo may be mentioned the trade in indigo seed, which is an important item in the exports of these provinces to Behar and Bengal. It is found there that far better results are obtained from

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* NOTE.—In the year ending September 30th, 1878, the railway imports from the *Panjáb* amounted to 24,613 maunds. Most of this must have come from Dehli. It was chiefly consigned to the following blocks—

Oudh and Rohilkhand Railway.	Meerut.	Agra.
10,835 maunds.	6,150 maunds.	4,704 maunds.

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seed imported from these provinces than from that locally produced. In the year ending September 30th, 1878, nearly 130,000 maunds of indigo seed were exported by rail from these provinces to Behar alone. A considerable quantity was sent in boats down the river Ganges; in the year ending March 31st, 1877, 35,975 maunds were thus despatched from the city of Cawnpore.

Wheat.—Wheat is noticed separately from the other kinds of grain produced in these provinces, because it is the only kind in which there is a large export trade to Europe. The following is an account of the history of the wheat trade and its prospects for the future, kindly furnished by Messrs. Reinhold Brothers, of Agra, at the request of the Department of Agriculture and Commerce:—

"Shipments of wheat from India to Europe have been made for a number of years from the ports of Bombay and Kurrachee, where the surrounding wheat-growing districts offered particular facilities added to a superior quality of grain and often less charges in bringing the stuffs to those ports.

"The extension of the wheat trade which refers to the North-Western Provinces and the Panjab, and has Calcutta as its shipping port, dates from the season 1875-76.

"The home market at the time did not show any peculiarity in favour of this trade, and it was only the unusually cheap price of wheat in these provinces which attracted attention to this branch of trade. Four or five good seasons had accumulated large stocks in all markets and districts, and the prices of wheat fell in markets like Cawnpore and Agra to 30 or more seers per rupee (taking as standard quality what is known in trade as Etawáh wheat, or, as a Calcutta mark, Mountain Club No. 2).

"The East Indian Railway Company made liberal concessions in conveying the grain, and so up-country merchants were actually able to offer their shipments in the Calcutta market at Rs. 2 to Rs. 2.2.0 per bazar maund ready bagged and packed for Howrah station.

"It was further facilitated by an exceptionally low exchange (about 1*s.* 6*d.*). The ship freight was at its normal rate during the season.

"The abolition of the wheat duty must have favoured the trade to the extent of its value, as any reductions or diminution of charges produce more chances for successful competition.

"The following (1876-77) season was again an exceptionally good wheat season for the Upper Provinces, with still a good surplus stock of former years, and the trade received a new impulse by the political aspect in the east of Europe. The blockade of the Black Sea caused considerable speculation and rise of prices in the English market, and now it became the demand of the home market which fostered and influenced the wheat trade in this country, and prices rose in the Calcutta market to Rs. 5 per maund. This rate could at the time not compete profitably in the English market, but was locally caused by the block on the railway; and as merchants had their shipping previously engaged, they had often to fill their vessels at heavy losses. This period has had another effect on the trade which is often overlooked, but in our opinion affects the business seriously. As said before, owing to the railway block, Calcutta merchants were often obliged to buy *pêle mêle*, of which native merchants took advantage by a careless and sometimes fraudulent system of packing, which ultimately led to no end of complications and vexations on the Commercial Exchange at home amongst all concerned, as consignors, consignees, brokers, and millers. The consequence of all was that Indian wheat must be offered comparatively much cheaper, on this account alone, to compete with American and continental grain. A check on the export trade of wheat commenced in the month of August 1877, when, with the failure of the rains, people became aware of the likelihood of a scarcity. The rate rose in a few days sufficiently to put a stop to further despatches to the Calcutta market, and by the end of last and the beginning of this year (1878) it was found that the stocks of wheat in the North-Western Provinces were pretty fairly exhausted, which was made very clear by the importation of grain into districts which were looked upon as the best wheat producers and feeders to the various marts. At this time the Panjab stepped in with supplies for the local demand, and was able to pass off its inferior and old grain, which had been found unfit for exportation to Europe.

"The prospect of the wheat crop of 1877-78 looked pretty favourable until marred by the cold winds of the month of March. In most districts the grain was not sufficiently developed, and consequently light and inferior.

"The scarcity in the North-Western Provinces kept the rates in the various bazars equal, and often above Calcutta market or export prices, or, putting it into figures, say about one rupee per maund too high for export.

"If it had not been for the exhaustion of stocks in the North-Western Provinces the past season would have been very favourable for exports, as the English market kept exceedingly high, and the large amount of shipping in Calcutta reduced the freights to the ruinous rates of less than 10*s.* per ton.

"We consider the exports of the last harvest from the upper provinces to the Calcutta maket insignificant, because at no time Calcutta orders could be worked profitably from any of our principal markets. However, some despatches were made, mostly by speculators who had in the beginning of the year contracted forward sales, and of course became losers in these transactions.

"We are further of opinion that a good deal of the last wheat crop has been kept in private hands in the districts, and will help to collect gradually again a surplus stock.

"A wheat trade with Europe can only be beneficial to this country as long as the surplus stocks realise better prices than they otherwise would by bringing the money to the country. Thus only does a good plentiful harvest mean more riches to the ryots, which has not always been the case.

"The Indian wheat trade will in future be based on either—

1. High prices in Europe or failure of crops in America.
2. Exceptionally good crops in India.
3. Low ship freight.
4. Low exchange.

"All of which may be caused by many and various causes, which it would lead too far to elucidate here.

"The increase of the export trade during the famine in Madras, we believe our general résumé will show, rested on the large surplus stock in the upper provinces, as the Madras Presidency was less a purchaser of wheat than of coarser sorts of grain.

"The principal cause of the check to the wheat trade was the rise of prices in this country.

"In conclusion we beg to say that if the markets in the North-Western Provinces have got over the effects of the late scarcity, we consider in ordinary good seasons the normal rate of wheat to be about 18 to 20 seers for one rupee, taking Agra as the centre, at which rate the European market would require already exceptional fluctuations to be able to compete."

It will be seen from this account that it was not till the year 1875 that wheat was exported from Calcutta in any very large quantities, and from that year to the year 1877, each year shows a decided increase. The failure of the June rains in 1877 gave the trade a decided check, which has since continued through a period of unusually high prices.

The parts of these provinces in which there is most wheat cultivation are the divisions of Meerut and Rohilkhand and the districts in Oudh which border on the Gogra. The subjoined statement shows the amount which was exported to Calcutta in the year ending September 30th, 1878, from each block, but it must be remembered that a great deal of wheat is not

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consigned to Calcutta direct from its place of production, but is first collected in intermediate marts, whence the Calcutta consignments are made. The chief of these marts are Cawnpore, Agra, and Delhi; the first for the districts of the Lower Doab, Bundelkhand, and Oudh; Agra for the districts of the Middle Doab; and Delhi for the districts of the Meerut division. Since Delhi is not the centre of these provinces, exports from it are not included, and therefore a portion of the wheat actually exported from these provinces does not figure in the returns.

From Stations within limits of the				From Stations on the		Total.
Meerut Division.	Agra Division.	Allahabad Division.	Benares Division.	Oudh and Rohilkhand Railway.	Muttra-Hathrás Railway.	
76,088	82,485	327,324	12,214	2,33,510	255	729,055

The year for which these figures are given was one which commenced with the failure of rain which was noticed above as giving a serious check to the trade; and throughout the year prices have been so high as to scarcely admit of exporting at a profit. The extent to which the trade fell off may be seen from the returns of wheat sent by road into Delhi from the Meerut division in the months of April, May, and June 1877, that is, before the failure of rain could be anticipated. This amounted to 637,257 maunds, very nearly the whole of which must have been for export to Calcutta.

In the year ending September 30th, 1878, a considerable amount of wheat was sent from these provinces to Bombay. The railway returns are summarised below. It must be remembered, however, that the wheat which is sent to Bombay was not destined for export to Europe, or to supply the abnormal demand occasioned by the *famines in* Bombay and Madras.

From Stations within limits of the				From Stations on the		Total.
Meerut Division.	Agra Division.	Allahabad Division.	Benares Division.	Oudh and Rohilkhand Railway.	Muttra-Hathrás Railway.	
13,026	8,370	56,203	583	59,432	—	112,778

Wheat was exported to Bombay in company with grain of other different kinds, and there is no reason why it should be noticed separately from them, since its export was influenced by the same conditions, and is not due to the European demand, as was the export trade to Calcutta.

Edible Grains other than Wheat.—The chief of these are gram (*cicer arietinum*), rice, and the autumn millets (*holcus sorghum* and *penicillaria spicata*); but there are numerous other kinds, each of which does not of itself deserve separate notice. These different kinds are not grown in the same proportion throughout the provinces; but as might be expected, different conditions in soil, climate, and water-supply make themselves seen very plainly in localising to some extent the different kinds of crops. This is especially evident with rice, which is most grown in the districts of the sub-Himalayan and penultimate belts. Thus the per-centage of rice area to total cultivated area is in Sahâranpur, 15·9; Bareilly, 27·8; Gouda, 50·1; and Gorakhpur, 38·5; while in Meerut it is only 2·2, in Aligarh ·6, in Cawnpore 2·7, and Bánda 3·6.

The portion of the cultivated area in these provinces which bears a crop in both autumn and spring is comparatively small, and by far the larger part bears only one crop within the year, which may be (*roughly speaking*) either sown in June and reaped in October, or sown in October and reaped in April. Examples of the former class of crop are rice and the various millets (joár, bájra, &c.); examples of the latter are wheat, barley, and gram. Whether the crop on any field is to be an autumn or spring one is determined partly by custom, which in some cases favours the alternation of autumn and spring crops, and partly by the conditions of the land as to water-supply, &c. Should the means of irrigation be scanty, or *nil*, other things being equal, an autumn crop would be grown, since this, gaining its water from the rains, is to a great extent independent of artificial irrigation. On the other hand, a spring crop is preferred for land which can be easily and effectually irrigated in case of the winter rain failing, as very frequently happens. From there being two harvests within the year it follows that the grain trade varies in different periods of the year not only in the kind of grain dealt in, but also in the direction in which it runs.

Causes affecting the conditions of the crops are often very local in their action, and so it is not uncommon to see a stream of export trade in autumn grain not only checked but turned by mere anticipation of a failure of the spring harvest.

A statement is appended showing the movements of grain by rail between the different blocks in these provinces during the year ending September 30th, 1878, as well as between these provinces and places outside their limits with which trade is transacted.

MOVEMENT of GRAIN by Rail within the Provinces.

—	Imports to each block within the provinces from all other blocks within the provinces.						Exports from each block within the provinces to all other blocks within the provinces.					
	To Meerut.	To Agra.	To Allahabad.	To Benares.	To Rohilkhand.	To Oudh.	From Meerut.	From Agra.	From Allahabad.	From Benares.	From Rohilkhand.	From Oudh.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Total of 1st quarter.	32,085	311,136	58,945	3,049	354,670	Included in Rohilkhand.	139,257	10,876	438,326	165,698	5,729	Included in Rohilkhand.
„ 2nd	11,155	84,331	34,187	6,797	172,820	18,486	217,440	5,575	60,685	31,256	4,162	8,658
„ 3rd	26,322	345,872	123,964	123,240	2,913	2,464	88,149	20,789	35,456	3,245	393,427	73,818
„ 4th	7,294	41,335	526,362	45,797	3,870	3,048	43,309	89,979	25,775	7,545	431,395	29,703
Total -	76,856	782,674	743,459	178,092	534,273	23,998	488,155	127,219	560,242	207,744	834,713	112,179

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MOVEMENT of GRAIN by Rail from and to the North-Western Provinces.

—	Total Railway Imports of Grain into the North-Western Provinces.								
	From Calcutta.	From Bengal.	From Behar.	From Panjab.	From Rajputana.	From Central Provinces.	From Bombay Presidency.	From Bombay Town.	Total Imports.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds:
Total of 1st quarter	40,718	172,042	1,834,629	869,045	43	631,306	158,341	711	3,706,835
" 2nd " -	140,483	541,083	1,314,658	1,680,646	259	285,680	47,095	2,313	4,013,167
" 3rd " -	11,583	61,233	120,988	45,691	652	3,282	43	285	243,707
" 4th " -	1,210	17,315	46,490	43,754	3,231	4,117	303	92	116,494
Total	193,994	791,623	3,316,715	2,639,136	4,185	924,385	205,782	3,401	8,080,203

—	Total Railway Exports of Grain from the North-Western Provinces.								
	To Calcutta.	To Bengal.	To Behar.	To Panjab.	To Rajputana.	To Central Provinces.	To Bombay Port.	To Bombay City.	Total Exports.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Total of 1st quarter	4,706	106	949	8,530	20,192	5,702	184,494	28,414	253,093
" 2nd " -	6,672	418	1,501	35,389	18,926	4,294	33,890	63,224	164,314
" 3rd " -	603,566	5,547	10,468	32,547	276,481	58,158	207,118	227,861	1,421,746
" 4th " -	155,988	1,081	40,230	6,742	10,300	53,287	51,620	66,414	385,663
Total -	770,932	7,152	53,148	83,208	325,899	1,21,441	477,122	385,913	2,224,816

To understand the significance of the figures it must be remembered that the agricultural condition of the different quarters of the year was as follows:—

First quarter, October 1st, 1877, to December 31st, 1877.—There had been an almost complete failure of the autumn rains, and the autumn crop was consequently in great measure lost. The condition of the Rohilkhand and Agra divisions was specially bad and famine relief works were started first within their limits. Though, so far as the autumn rains went, the Meerut division was equally badly off, yet better means of irrigation saved a portion of the crop and a series of good harvests had filled the granaries. Great apprehensions had been entertained concerning the spring harvest for which rain was absolutely necessary, but a timely fall in October allowed of ploughing and sowing, while more rain in November gave hopes of a good spring harvest.

Second quarter, January 1st to March 31st, 1878.—Periodical falls of rain continued and made the prospect of a good spring harvest appear more and more hopeful. The area under spring crops was far larger than usual, since a great deal of the portion usually allotted to autumn crops was sown.

Third quarter, April 1st to June 30th, 1878.—The spring harvest when gathered in fell far below expectations, except perhaps in Rohilkhand. The failure of the autumn rains had considerably lowered the water level and the ground was far drier beneath the surface than is usually the case. From this the crops were stunted and weakly and ill able to resist the rust and blight which attacked them.

Fourth quarter, July 1st to September 30th, 1878.—At the commencement of this quarter it was feared that there was going to be a second failure of the rains. But all apprehension was relieved by a fall in August and September, which, though late, gave a fair average autumn crop.

The statistics of railway trade in grain which passed between the different blocks of the provinces show that in the first quarter of the year the Rohilkhand and Agra blocks imported very largely, while the Meerut, Allahabad, and Benares exported. In the second quarter there was a marked decrease in the imports, and the Meerut block alone was able to export to any considerable extent, while Rohilkhand still continued the chief importer. The third quarter is characterised by a large export from Rohilkhand, nearly all of which was taken by Agra. A good spring harvest had enabled Rohilkhand to recover its losses by the sale of its surplus. Between the other blocks trade decreased considerably. The chief feature in the fourth quarter was the export of grain to the Allahabad block. Rohilkhand was still the largest exporter, but Agra had sufficiently recovered itself to begin exporting. The import of grain by the Allahabad block was not to supply its own consumption, but merely indicates the collection of grain at Cawnpore for export to the ports of Calcutta and Bombay.

The statistics of grain trade between the provinces as a whole, and places external to them, exhibits variations of the same kind. The first and second quarters were characterised by enormous imports chiefly from Behar and the Panjab. In the third quarter exporting began chiefly to Calcutta, and this continued, but in a less degree, during the fourth quarter. A judgment may be formed from the figures of the first statement as to the proportions in which the imports were distributed between the different blocks of the provinces, or in which they contributed to the exports.

Iron (including Hardware).—Iron ore is indigenous in the hill districts of these provinces, and iron has always been produced from it by the rough processes of smelting known to the hillmen. Some years ago iron works were started by Government near Rámnagar, but from scarcity of fuel and difficulty of carriage as well as from inexperienced management they have not as yet been a financial success. The amount imported from the hill districts to the plains is not very considerable, only amounting to 1,799 maunds in 1877–78. Native iron is also imported from Nepal, but not to any great amount, the gross import in 1877–78 being 3,156 maunds. Iron occurs also in the range of hills which skirt these provinces to the southward in the territory of the native states of Gwalior, Bundelkhand, and Rewah. This is the source from which nearly all the country iron used in these provinces is drawn. In 1877–78 the imports from Gwalior amounted to 11,383 maunds, and from Bundelkhand 148,601 maunds. But throughout the provinces European imported iron and steel is gradually ousting the country article, being considered superior to it in quality and cheaper in price. No inconsiderable amount of European iron is imported even to those places in which country iron is indigenous. Thus in

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1877–78 3,800 maunds were sent to the state of Gwalior, and 7,406 maunds to the hill districts of Dehra Dún, Garhwál, and Kumaun.

The imports of European iron and hardware reach these provinces principally viâ Calcutta, though Bombay takes a larger share in this trade than in cotton goods. During the year ending September 30th, 1878, 457,473 maunds were imported from Calcutta and 61,190 from Bombay.

The latter consisted chiefly of railway iron and was consigned to the Agra block, being destined for the Rajputana and Gwalior state railways. Probably for the same reason the Agra block took the largest share of the Calcutta iron (197,098 maunds). The Allahabad block took 135,076 maunds, most of which was consigned to Cawnpore, which is the chief entrepôt for iron as for cotton goods. It has been noted above that by far the largest imports of country iron are from the Bundelkhand state of Chatarpur, &c. Nearly the whole of this which is not consumed in the trans-Jumna districts finds its way to Cawnpore.

In the year 1876–77, Cawnpore received 42,777 maunds of iron from Bundelkhand and 60,766 maunds from up-country. A great part of this latter must have been from Gwalior. Nearly the whole of this must have been sent into Oudh, which received from Cawnpore in the same year 36,186 maunds by road, and 24,431 maunds by rail. Iron consigned from Calcutta to Agra and Meerut, as well as that received from Gwalior, is passed on to the districts of Rohilkhand and Oudh; in 1877–78 the amount which crossed the Ganges by road into Rohilkhand was 9,717 maunds and into Oudh 9,567 maunds, the latter exclusive of consignments from Cawnpore.

Opium.—The opium produced in these provinces is all extracted from poppy cultivated on account of Government. Its cultivation is only permitted in certain districts in which special arrangements are made with the cultivators by the officers of the opium department. The cultivators are permitted to grow the poppy on certain areas of their holdings and are assisted by money advances on condition that they give up the whole of the produce at a certain fixed price. The opium thus obtained is forwarded to the Government factory at Gházipur, where it is purified and made up into oblong cakes if for consumption in this country, and into round balls if for export to China. The districts in which the cultivation of the poppy is permitted are three in Rohilkhand (Bareilly, Budaun, and Sháhjahánpur), the Doáb districts from Etáwah and Mainpuri downwards, and all the districts in Oudh and the Benares division.

In the year ending September 30, 1878, the consignments of raw opium by rail to Gházipur amounted to 5,232 maunds from the Agra block and 15,545 from the Allahabad block. The amount consigned from stations on the Oudh and Rohilkhand Railway is not known. In the same year 129,754 maunds were exported by rail from Benares to Calcutta.

Salt.—The manufacture of salt is not permitted in these provinces, although brackish earth is of common occurrence, from which the extraction of an impure quality of salt was formerly a considerable industry. Salt is now obtained from four sources (i.) Thibet, (ii.) the Upper Panjab, (iii.) Gurgaon and Rajputana, (iv.) Calcutta.

(1.) *Thibet salt.*—Salt is brought from Thibet across the snow passes laden on the backs of sheep. It is fairly pure, containing some 93 per cent. of chloride of sodium (Inland Customs report, 1867–68, note 10), and is vastly preferred by the natives of Kumaun and Garhwál and by the Nepalese to any kind of salt which can be imported from the plains. It is said to have more piquancy of taste and to be more wholesome than either Lahori, Rajputana, or Calcutta salt, and it is only the former of these three kinds which competes with it in the hills, and that to no very great extent. On the other hand the consumption of Thibet salt is confined to the hills, and little or none ever reaches the plains. In 1877–78 the imports of salt from Thibet into the hill districts amounted to 31,709 maunds. During that year traffic between the hill districts and the plains was not registered, so it cannot be said whether any of this Thibet salt passed on beyond the hill districts. We have, however, statistics for 1876–77 which show that during that year only 101 maunds of salt passed from the hills to the plains. According to our present information Thibet salt would appear to be gradually giving way before that from the plains; the amount of this latter exported to Nepal in 1877–78 being some 13,000 maunds in excess of the exports in the previous year.

Thibet salt is the only variety which comes into those provinces untaxed. The advisability of taxing it has been fully discussed, and it has been decided that the advantages of taxing it would be incommensurate with the difficulty and expense of enforcing the duty, and the distress which would be caused to the numbers who now make a livelihood from the trade.

Salt is imported from the salt mines of the Upper Panjáb (Pind Dádan Khan, &c.), and in the plains is more generally preferred than all other imported varieties. Unfortunately Lahori salt has not been distinguished from other kinds in the registration returns, so that the amount annually imported cannot be estimated with accuracy.

In *Rajputana salt* is included that from salt pans and marshes in the Gurgaon district of the Panjáb, as well as that produced in Rajputana itself. There are several varieties: the most important are *Sambhar* salt from the lake of that name in the Jaipur territory, *Balambha* from the state of Bhartpur, *Dindwana and Pachbadra* from salt marshes in the Jodhpur state, and *Sultanpur* and *Salambha* from different parts of the Gurgaon district. All these varieties are obtained by evaporation, caused either naturally, as on the edge of lakes or marshes (Sambhar and Dindwana), or artificially by exposure in pans (Balambha, Sultanpuri, and Salambha). Now that treaties have been effected with those states of Rajputana in whose territory salt was produced, the places from which salt is imported are limited to the Upper Panjab, two places in Gurgaon, the Sambhar lake, and three other lakes in Jodhpur territory. By far the most important variety is the Sambhar, which is supplanting all other varieties in the consumption of the provinces, its import being facilitated and cheapened by a light line of railway running to the place of its production. The amount of this salt actually purchased during the past year was about 2,700,000 maunds, and it is probable that during the present year sales will reach a still higher figure. The light railway is hardly adequate for the carriage of the rapidly increasing trade. Agra and Delhi are the two centres of the salt trade. Through the former comes Sambhar salt, while the latter takes all the Gurgaon salt (Sultanpuri and Salambha), as well as some of the other varieties (Dindwana, &c). In the year 1877–78 the imports by road from Delhi amounted to 452,676 maunds, 109,169 maunds of which subsequently crossed the Ganges into Rohilkhand. The road imports from Rájputana to Agra in the same year came to 100,565 maunds.

We have already seen that the province of Rohilkhand draws most of its salt from Delhi. Oudh, on the other hand, is chiefly supplied from Cawnpore, to which Sambhar salt is carried from Agra in large quantities. In 1876–77, 141,093 maunds of salt were sent from Cawnpore into Oudh by road alone, while in the same year the total amount which crossed the Ganges between the Doáb and Oudh only came to 177,892 maunds. To this must be added the amount consigned by rail, both from Agra and from the Rajputana State Railway viâ Agra.

Cawnpore is also a salt distributing mart for the trans-Jumna districts of Bundelkhand. In 1876–77 63,390 maunds were despatched by road from Cawnpore towards Bundelkhand.

European salt imported viâ Calcutta does not come much further up country than Benares, at which place its cost is about that of the Rajputana article. During the year ending 30th September, 1878, CHAP I. QN.1

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60,000 maunds reached these provinces from Calcutta, of which 55,000 maunds were taken by the Benares block. From the East Indian Railway trade report for the half year ending 30th June, 1877 it appeared that in the six months, taking the whole length of the line, the amount of salt carried up country from Calcutta was about the same as that carried downwards from the Panjáb, Delhi, and Agra, each amounting to some ten lakhs of maunds. It appears then that these provinces take but a small amount of the Calcutta article, which will be still more diminished by any fall in price of Rajputana salt, whether owing to reduction of duty or cheapening of carriage.

Oil-seeds.—Under this head are included various kinds of seeds from which oil is extracted, the chief of which are linseed, mustard, rape, and til (or gingelly). These are grown all over the provinces, but, except in the sub-Himalayan and penultimate belts and the tract of Bundelkhand, they are as a rule not grown alone, but sown as a subordinate crop in the corn fields either along the edges as a border or in parallel lines across it, or broadcast. It is probable that in almost all parts of the provinces the quantity of oil-seeds produced is sufficient for local wants, if not for exportation, though it is chiefly from the two localities named above that there is a considerable surplus for export. The districts which export by far the largest quantity are those of Kheri, Bahraich, and Gonda, in the province of Oudh.

In the year ending March 31st, 1878 the net exports by road from Rohilkhand to the Doab were 98,017 maunds. In the preceding year the city of Cawnpore received by road 144,487 maunds from Oudh and 424,067 maunds from Bundelkhand. Mustard and rape were the most important items in the imports from Oudh and Rohilkhand, while of the various kinds which come from Bundelkhand linseed figures largest. Oil-seeds are collected in Cawnpore, not to supply local consumption, but for export to Calcutta, and it is as one of the most important of the exports to the ports, and not as an article of internal trade, that oil-seeds are chiefly remarkable.

The subjoined tables show the exports by rail to Calcutta and Bombay from each of the North-Western Provinces and Oudh blocks, in the year ending Sept. 30, 1878:—

Exports to Calcutta from blocks—

Description.	Meerut.	Agra.	Allahabad.	Benares.	Oudh, Rohilkhand Railway.	Total.
Linseed -	252	1,990	426,077	10,813	63,661	502,793
Mustard and rape.	27,543	126,805	783,699	37,333	37,477	1,012,857
Til -	—	253	5,195	9,361	—	14,809
Other kinds.	—	16,436	143,424	11,906	9,471	181,237
Total -	27,795	145,484	1,358,395	60,413	110,609	1,711,696

Exports to Bombay from blocks—

Description.	Meerut.	Agra.	Allahabad.	Benares.	Oudh, Rohilkhand Railway.	Total.
Linseed -	—	—	81,732	1,840	71,269	1,24,541
Mustard and rape.	5,502	53,785	412,338	497	34,998	5,07,120
Til -	—	—	112	—	—	112
Other kinds.	5	—	827	—	896	1,728
Total -	5,507	53,785	495,009	2,337	107,163	633,501

The Allahabad block is out of all comparison the largest exporter, and most of the oil-seeds registered, as leaving it were despatched from the city of Cawnpore, which is the chief collecting mart for them in Upper India.

A very considerable amount is sent down the Gogra from the Oudh districts of Bahraich and Gonda. This is most of it primarily consigned to Patna, whence it is despatched to Calcutta by rail. In the year ending March 31st, 1878, the oil-seeds exported down the Gogra amounted to 2,453,682 maunds, of which over 1,400,000 maunds consisted of linseed. The amount sent down the Ganges is thus over one-third more than that consigned by rail to Calcutta from all the blocks in the provinces.

Stone.—Stone is only found in the hilly districts at the upper and lower boundaries of the provinces. In the ordinary districts of the plains it does not occur, and its use in them is limited to the small hand-mills used for grinding corn and (in the eastern districts) to kolhus or sugar-mills. The towns which are noted for their stone-built streets are those which are situated near stone quarries, *e.g.*, Muttra and Háthras, from which the quarries in the Agra district are only distant 30 or 40 miles.

The use of stone being so limited in all places but those of its production, the trade in it is of but secondary importance. Gwalior, Bhartpur, and the Agra districts are the places from which most appears to be imported, coming as in slabs or hand-mill stones. The former are used for building purposes, and do not, as a rule, travel far; the latter are distributed over the whole of the Meerut, Rohilkhand, and Allahabad divisions.

In the year ending March 31st, 1878, 205,902 maunds of stone were imported by road from the native states of Gwalior, Rajputana, and from the trans-Jumna portion of the Agra district. Agra is the chief stone mart in the provinces, and it re-exports the stone it receives by road and by rail.

By road the stone passes up viâ Háthras towards Rohilkhand, which in the year ending March 31st, 1878, received 5,851 maunds. A considerable portion is embarked on the Ganges Canal in the Aligarh district, and sent down to Cawnpore, which in the year ending March 31st, 1877, received 5,949 maunds in this way. Cawnpore distributes the stone to Oudh on one side and Bundelkhand on the other.

A considerable quantity of stone is despatched from Agra to Muttra and Delhi, part of which is despatched by the Agra canal, and part by road. In the year ending March 31st, 1878, Delhi received by road 26,851 maunds, 1,752 maunds of which she re-exported by road to Meerut.

The subjoined statement shows the exports of stone from the Agra block to each other North-Western Provinces and Oudh block during the half-year ending March 31st, 1878:—

From Agra block to block—

Meerut.	Allahabad.	Benares.	Oudh and Rohlkhand Railway.	Muttra and Háthras Railway.
24,099	20,101	3,239	17,062	—

Sugar.—The natural area for the cultivation of the sugar-cane in these provinces would appear to be the sub-Himalayn and penultimate belts, in the former of which it is frequently grown without irrigation, while in the latter it is, as a rule, irrigated, except in exceptionally situated tracts, such as the alluvial beds of rivers, &c. But to this area must now be added a great portion of the districts irrigated by the Ganges canal, in which facilities for obtaining an abundant supply of water are gradually extending sugar-cane cultivation over tracts which formerly were strangers to it. The per-centage of sugar-cane area to the total cultivated area ranges in the Rohilkhand districts from 8 in Bijnor to 2·7 in Budaun, in the trans-Gogra districts of Oudh and the Benares Division from 3·2 in Gorakhpur to 1.5 in Gonda, and in the cis-Gogra districts of Oudh, within the limits of the penultimate

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belt, from 5·5 in Fyzabad to 3·9 in Sitapur. There is also extensive sugar-cane cultivation in the Azamgarh and Jaunpur districts.

South of the penultimate belt, sugar-cane cultivation seems limited to those districts in which there is canal irrigation, and occurs to any considerable extent in only a few of these. Thus the per-centage is in Unao 1·4 and in Agra ·6, while in Meerut and Etah (both canal-irrigated districts) it is 6·4 and 2 respectively. In both of these latter districts a considerable amount of cane is grown on the old alluvial bed of the Ganges, which is not irrigated from the canal. Districts which depend for their cane cultivation on the canal alone do not show such high per-centages.

Speaking generally, it may be said that the portions of the provinces where sugar production gives a surplus over consumption are the Meerut, Rohilkhand, and Benares divisions, and the province of Oudh; while the trans-Jumna tract from Agra to Bánda imports largely, and the districts of the middle and lower Doáb to a less extent.

In the year ending March 31st, 1878, 446,162 maunds of sugar crossed the Ganges from Rohilkhand and the Doab by road alone, and in the preceding year 337,873 maunds crossed from Oudh into the Doab. In this latter year 1,27,498 maunds were sent by road towards Bundelkhand from the city of Cawnpore.

The subjoined statistics show the railway trade in sugar during the year ending September 30th, 1878, between each of the different blocks in the provinces to each other block in the provinces:—

Exports of Sugar by Rail from each of the Blocks in these Provinces to the other Blocks in the Provinces.

From Blocks—

Meerut.	Agra.	Allahabad.	Benares.	Oudh and Rohilkhand Railway.
50,392	1,875	26,470	76,695	152,011

Imports of Sugar by Rail to each of the North-Western Provinces and Oudh Blocks from the other Blocks in the Provinces.

To Blocks—

Meerut.	Agra.	Allahabad.	Benares.	Oudh and Rohilkhand Railway.
64,602	174,251	46,171	242	26,526

It will be noticed that taking merely internal trade into consideration, the Benares and Oudh and Rohilkhand railway blocks are the largest exporters, while the Agra block is by far the largest importer of sugar. The export trade in sugar to the ports is not considerable in amount. The trade with all the other tracts adjoining those provinces is one of export, with the exception of the province of Behar, in Lower Bengal, from which sugar is imported in considerable quantities.

Sugar is largely exported to the Panjab by road and rail. By road the net exports in the year ending March 31st, 1878, amounted to 437,238 maunds, while the net exports by rail in the year ending September 30th, 1878, were 126,525 maunds, the largest exporting blocks being the Oudh and Rohilkhand Railway and the Benares division. Rajputana also takes a good deal of sugar, the net exports by road being 140,702 maunds in the year ending March 31st, 1878, and by rail 206,919 maunds in the year ending September 30th, 1878, the principal exporting blocks being the Allahabad and the Oudh and Rohilkhand Railway.

The export trade with the Central Provinces and the states of Bundelkhand is not considerable enough to deserve separate notice.

The net imports from the provinces of Behar by road only just balance the exports, while the exports by the river Gogra are enormously in excess of the imports, amounting in the year ending March 31st, 1878, to 619,959 maunds. The districts in these provinces immediately adjoining Behar are all large sugar producers, and the local trade between them and the Bengal provinces is much in their favour. The sugar exported by the Gogra must have been destined for places beyond Behar itself. The imports from Behar by rail in the year ending September 30th, 1878, amounted to 261,774 maunds, the major portion of which was taken by the Agra division.

Sugar is not so well or carefully cultivated in the North-Western Provinces as in many other parts of the world, and its manufacture is conducted by very rude processes. The attention of this Department has been turned to the improvement both of the cultivating and manufacturing systems; and new processes, either recommended by European planters, who are personally engaged in the production of sugar, or specified in the treatises on the industry in other countries, have become the subject of experiment. Endeavours are also being made to procure new plants from outside India. Should material improvement be possible, there is no reason why these provinces should not compete in better markets.

Timber.—The only portions of the North-Western Provinces which do not seem to produce sufficient timber for the ordinary domestic and manufacturing purposes are the districts of the Meerut and Agra divisions, many of which in their conspicuous treelessness resemble the neighbouring tracts of the Panjáb and Rajputana. It is in these two divisions that the greater part of the timber trade seems to centre which is destined for the supply of provincial requirements. By rail the only large importer is the Agra block, which in the year ending September 30th, 1878, imported 57,032 maunds net; but this was not entirely to supply local consumption, for some portion of the timber, though consigned to Agra, was merely collected there for despatch to Rajputana. Delhi is another centre for the timber trade, and shares with Agra a transit traffic in timber between the more thickly-wooded parts of these provinces and the treeless plains of Rajputana and the Panjáb.

Although, as stated above, most districts in these provinces produce enough timber for ordinary purposes, yet the only tract from which there is much timber exported is that which has been designated the sub-Himalayan, to which may be added the southern portions of the Bundelkhand districts.

But by far the larger portion of the timber which crosses the provinces comes from the country of Nepal, entering our territory both by road and river. In the year ending March 31st, 1878, the imports of timber from the Nepal forests amounted to 591,892 maunds.

From the sub-Himalayan region, therefore, whether in our territory or in that of Nepal, most of the timber is despatched which figures in the trade of these provinces. The course of the trade is, roughly speaking, at right angles to the line of the principal rivers; and in consequence, though conveyance by water is peculiarly suitable for timber, it is only in the first half of its journey that rivers are much used for transporting it.

On first leaving the place of its production the timber is generally made up into rafts and floated down the streams which flow towards the Ganges or Gogra. On both these latter rivers there are large timber wharves, at which these rafts are unloaded. The chief wharves on the Ganges are Garhmukhtesar, in the Meerut, and Anúpshahr, in the Bulandshahr districts. Timber is floated down in the rains to these places from the Bijnor jungles, and from them is despatched by road to Meerut, Delhi, or Agra. A considerable quantity is also consigned to these three towns by road direct from the forest it is cut in. Thus, in

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the year ending March 31st, 1878, 149,216 maunds of timber and 317,810 maunds of bamboos crossed the Ganges from Rohilkhand into the Doab, coming in carts from the Bijnor and Tarái forests. As noticed in the answer to question 20, the dam of the Ganges Canal at Narora prevents rafts from Bijnor going down the Ganges below that point, and thus all the timber from Bijnor is concentrated at the Garhmuktesar and Anúpshahr wharves. Below Narora the Ganges receives timber from the Rámganga and Garra rivers, on which it is floated down from the Tarái above Bareilly. Part of this goes to the Farukhabad wharf and part to that at Cawnpore.

The chief wharves on the Gogra are those of Khairi and Bahrámghat; the latter is by far the most important, and is the great timber entrepôt for the Nepal forests, which lie on or near the Gogra. From Bahrámghat the timber crosses into the Doab by either road or rail; by rail 41,422 maunds were exported from the Oudh and Rohilkhand railway block (in which Bahrámghat is situated) during the year ending September 30th, 1878.

Subordinate Articles of Trade.—The most important of the other commodities which figure in the trade of these provinces are hides, ghí, tea, and tobacco.

Hides are exported to Calcutta in considerable quantities from the towns of Delhi and Cawnpore.

Ghí (clarified butter) is another export to the ports, consigned chiefly from those parts of the provinces where there is much waste ground for the grazing of the cattle from whose milk the ghí is made. Thus it happens that the little town of Jaswantnagar, in the Etáwah district, exports a considerable quantity of ghí each year, being situated near a large tract of raviny ground on the Jumna bank, well suited for cattle grazing.

Tea is grown both in Kumaun and Dehra Dún, but its cultivation would appear to have almost reached its maximum. The annual exports from Kumaun are estimated at about 500,000 lbs., of which some 300,000 lbs. are purchased by Kabuli merchants, and taken by them to Bokhara and other parts of Central Asia.

Tobacco is grown in almost every part of the provinces, but chiefly in those districts where the climate is damp and soil moist. It is, with pán, the chief luxury of Indian consumption, and is either smoked or chewed by almost every native in the country. The best qualities grown in the provinces are from Rohilkhand and Oudh, which exported to the Doab by road in the year ending March 31st, 1878, 9,825 maunds and 31,897 maunds respectively. A tobacco farm has been lately started at Gházipur and Poosa (in Bengal) by a Calcutta firm, under the management of an American curer, and there is good reason for expecting that a cured leaf will be produced which will command a ready sale in the European market.

The broad characteristics of the trade of the North-Western Provinces and Oudh have now been noticed from the aspect of the chief commodities in which this trade consists, and it seems unnecessary here to go again over the same ground from another point of view, re-classifying the trade according to the different streams in which it runs, and the different states or provinces affected by it. Reference may be made for this to the trade report for the year ending March 31st, 1878, in which this latter was the mode of classification primarily followed.

As has been stated before, although statistics of road and river traffic are available for the whole of the year 1877–78, yet the railway statistics which have up to date been collated are only for six months of this year. If to these figures could be added the railway returns for the first six months of the current year (1878–79), we should have railway figures for a complete year, but although this could be done in the case of a few particular commodities, it has been found impossible with the trade as a whole. But even if the railway statistics were completed in this manner little more than a rough guess could be hazarded as to the total trade of the year they concern, since the road and river returns would be for different years coinciding in period for six months only.

Trade in these provinces consists almost so entirely of traffic in country produce that a history of the movement of produce from the field to its eventual destination will comprise a description of the classes engaged in conducting the movements of trade.

To begin with the cultivator. He has three ways of disposing of his surplus out-turn. Firstly, he may take it to the nearest mart, and dispose of it himself, which he does by applying to a "weighman" (and as a rule he generally contracts a habit of going to the same "weighman" year after year), who finds out for him a purchaser and helps to arrange a price, receiving in return a commission or weighment fees.

Or, secondly, he may dispose of it by arrangement at his village to one of the petty traders or produce collectors, termed *baipáris,* who travel about the country for the purpose of collecting produce. Very often the *baipári* confines his operations to the same set of villages year after year, and makes advances to cultivators, with whom mutual credit has been established for delivery of grain. As a rule, cultivators carry in on their own carts the produce which the *baipári* purchases for the central mart.

The *baipári* purchasers are supplemented by special agent, occasionally sent out by central firms for special purchase.

Or, thirdly, the cultivators dispose of their produce to a local collecting merchant, who is sometimes a merchant pure and simple, sometimes the village banker, who, in his operations with the cultivating classes advances from time to time money, food, or grain, to be repaid at harvest, sometimes a wealthy member of the agricultural body who generally does a good deal of advancing business. These men dispose of the grain they collect from their small circle to the *baipáris* agents, or merchants, of small marts in the neighbourhood, and they too are often given advances by *baipáris* and agents for the delivery of a certain quantity of grain at the time of or shortly after harvest.

At the next stage in the trading scale we find firms (kotís) or branches of firms in the marts or collecting centres, to whom the weighmen and baipáris sell the produce either for transmission to other parts of India, where higher prices are ruling, or to the ports for export.

Usually a firm of any standing has branches in several places with its head-quarters at one or other of them. One of the principal firms in the North-Western Provinces has, for instance, its head-quarters at Allahabad with branches at Calcutta, Patna, Cawnpore, Agra, Delhi, and several other places. Another smaller firm, with its head-quarters at Agra, has only branches at five or six places all within 100 miles. As the first firm collects in a larger circle than the second, so also there are circles still smaller in which the head-quarters of the firm is probably found at a more insignificant mart.

If a firm wishes to collect from a place in which it has no branch, it does so by sending a commission to a firm of that place, or to a commission agent called "áratya." Commission business is termed "árat," and the "árat" of a firm often constitutes its principal work.

Payment for produce is effected by a system of "hundís" or bills of exchange, which are more commonly drawn at 51 days than at any other date. The "hundís" of well known firms are current at the principal marts and are negotiated by shroffs or bankers.

Hundís are provided by a class of "bill-brokers" called "*daláls,*" who are sent for by purchasing house or agent when hundís are required, and whose special business it is to know where hundís for every place of trade can be procured, and in what marts they are negotiable.

Credit is given under the hundi system to a limited extent. Each house has its "name" in the market for a certain capital and is allowed credit accordingly.

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ENGAL.

. *Toynbee.*

BENGAL.

In no part of India, perhaps, is commerce more active than in Bengal. Calcutta is, of course, the centre and focus of the trade and commerce of the province, but there are many other large trade centres in the interior (shown in the accompanying map) situated on the great waterways of the country. The state of trade and commerce in Bengal is illustrated by the following table taken from Mr. Cotton's report on the internal trade of Bengal for 1876-77. The figures merely show the quantities of staples passing the registering stations; and are neither exhaustive nor strictly accurate.

List of Articles.	By Country Boats.	By River Steamers.	By Rail.	By Road.	Total.	
					Quantity.	Value.
	Mds.	Mds.	Mds.	Mds.	Mds.	Rs.
Rice and paddy—						
Rice not in the husk	18,280,600	35,500	4,469,500	1,900,200	24,995,800	5,68,02,000
Rice in the husk	5,903,400	—	29,800	877,300	6,810,500	
Wheat	2,733,000	10,300	4,822,500	20,900	7,586,700	1,51,73,000
Pulses and gram	4,272,400	65,000	1,124,700	265,100	5,727,200	1,00,23,000
Other food-grains	1,843,000	—	107,300	314,000	2,264,300	39,63,000
Total of food-grains	33,032,400	420,800	10,553,800	3,677,500	47,384,500	8,59,61,000
Jute	9,178,600	587,900	3,382,400	242,500	13,661,400	4,09,84,000
Linseed	4,111,600	2,900	2,402,700	292,600	6,809,800	2,72,39,000
Mustard	4,005,600	96,900	1,266,400	217,000	5,585,900	2,23,44,000
Other oil-seeds	903,100	4,000	1,302,500	45,900	2,255,500	59,21,000
Total of oil-seeds	9,020,300	103,800	4,971,600	555,500	14,651,200	5,55,04,000
Indigo	40,950	160	115,170	410	156,690	3,13,38,000
Tea	12,200	266,900	95,300	—	374,400	2,99,52,000
Silk	14,408	355	17,132	37	31,930	1,59,65,000
Sugar (refined)	1,165,700	11,100	303,600	104,600	1,585,000	1,90,20,000
Ditto (unrefined)	2,278,900	—	562,700	119,300	2,960,800	1,18,43,000
Tobacco	1,724,100	22,300	280,900	113,000	2,140,300	1,07,01,000
Raw cotton	422,000	—	480,200	21,700	923,900	1,38,59,000
	No.	No.	No.	No.	No.	
Hides	1,421,200	12,300	3,502,700	119,900	5,056,100	1,01,12,000
	Mds.	Mds.	Mds.	Mds.	Mds.	
Saltpetre	337,000	—	518,400	19,300	874,700	52,48,000
	Rs.	Rs.	Rs.	Rs.	Rs.	
European piece-goods	1,20,82,100	56,77,200	9,38,75,600	30,17,600	—	11,46,53,000
	Mds.	Mds.	Mds.	Mds.	Mds.	
Cotton twist (European)	62,100	2,900	97,800	7,500	170,300	1,19,21,000
Salt	6,633,000	108,400	2,384,700	304,600	9,430,700	4,71,53,000

All the staples shown in this table, with the exception of salt and cotton piece-goods (which are exported from Calcutta into the interior of the country), find their way towards Calcutta chiefly by country boats along the magnificent water routes shown in the map. Along the lines of these established trade routes there has been an energetic and enterprising trading class from the earliest times. They have their agents in the interior who bring the surplus produce of each district to the most convenient point for embarkation. It may be said generally that every district in Bengal grows more than enough food-grains in ordinary years to support its own population, and exchanges its surplus produce for cotton piece-goods, salt, or food-grains of other kinds than those it grows itself. There is thus a constant ebb and flow of trade which penetrates more or less deeply from road, rail, and river into every district in Bengal. The further the distance of a district from the great highways of commerce, the smaller is the activity of its trade; the fewer the number of the trading classes, on the other hand, the larger are its surplus stocks of grain. In times of ordinary and local scarcity the trading classes of Bengal are quite energetic enough as a body to supply the deficiencies of one district from the surplus of another, so long as the regular and established trade routes and connexions are available for the purpose. Only in cases of very isolated portions of the province—such as Orissa was in 1866—and in times of very widespread famine (as in 1874) would it be necessary to supplement the resources of private trade by State interference and assistance. Mr. Cotton says: "Nowhere "in all India is internal traffic more active than it is "in Bengal when the rivers are full of water, when "every river is turned into a highway for the country "craft laden with merchandise, every stream into a "pathway, and every creek into a harbour for boats. "During the dry season of the year, when the lesser "rivers are not navigable, there is comparative "stagnation in internal communication." These water-routes were largely made use of in the famine of 1874.

CENTRAL
ROVINCES.

r. Nicholls.

CENTRAL PROVINCES.

In all the districts traversed by railways commerce is particularly active. The chief centres are Nagpur, Kamptee, Hinganghat, Wardha, on the railway and Toomsar, an entrepôt for grain in the Weingunga valley, and Dongargarh in the west and Raipur in the centre of the Chhattsigarh plain.

In the Nerbudda valley we have the manufacturing towns of Burhanpur, Khandwa, Harda, Seoni of the Hoshangabad district, Gadarwara, Narsinghpur, and Chota Chhindwara, Jubbulpore, and Murwarra.

There are large exports of grain from the Seoni, Chhindwara, and Betul districts. Saugor also has a

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CENTRAL PROVINCES.

Mr. Nicholls.

fairly active trade especially towards the north. Comparatively speaking, commerce is dull in Damoh, Mandla, Bilaspur, Sambalpur, and Chanda.

The external trade of the provinces increased from 102,341 tons in 1863–64 to 390,106 tons in 1876–77. The value in the former year was estimated at 3,909,008*l*. Cotton was then selling at extremely high rates owing to the American war.

Twelve years afterwards the external trade was valued at 8,113,619*l*.

The provinces have a fairly energetic and enterprising trading class in the districts in which there is brisk trade. In fact, elsewhere we have men of the trading class, possessed of capital and latent enterprise, but it is only where the railway penetrates or other adequate means of easy communication is opened out, that the energy and enterprise of the class is brought into play.

In the first rank as traders stand the Marwaris, to be found throughout the provinces. Lately several European agencies have been opened at Nagpur, Jubbulpore, and Harda; at Hinganghat and Wardha the cotton trade is almost entirely in the hands of the Mofussil Company and of Messrs. Warwick Brothers; and during the late dearth in Bombay and the Deccan, swarms of Bhattias, Banias, and Comptis came into the provinces to purchase produce, and many native agencies from Bombay, of more or less permanency, have been established.

Chanda and perhaps Sambalpur may be said to subsist mainly on their own resources, and do not export much, at least as compared with the other districts. Mandla, Damoh, and Betul figure next in this respect.

The remaining districts enjoy an active ebb and flow of trade, but as the exports very greatly preponderate, most of the districts absorb large quantities of bullion.

BERAR.

BERAR.

Mr. Dunlop.

The answer to this question is scarcely complete without reference to the weekly bazaars, which (besides numerous annual fairs) play such an important part in the machinery of distribution in these parts.

Thse bazaars are held weekly at some 300 places. Their attendance varies from 20,000 to some few scores of persons. The majority have a considerable attendance; and, besides brightening the whole life of the people, they stimulate trade and the interchange of commodities to an incalculable extent. It is quite a common thing for traders to go 20 miles to their bazaars.

And in point of commercial activity generally Berar stands very high. Apart from the traffic by railway, there is an active intercourse with the Central Provinces on the east: and in the cotton season every road carries cotton carts in search of a good market. Cultivators who are well enough off to sell their own cotton are by no means tied to one market. On the contrary, they are most keenly alive to any rumours regarding the demand for cotton at the various exchanges, and are quick to take their crop to the place where competition among buyers is greatest.

Since the introduction of the railway into Berar the trade of the province has been steadily increasing. The chief articles of exports are cotton, oil-seeds, wheat. And of imports, cotton piece-goods and yarns, iron, wheat, rice, sugar, spices, cocoanuts, salt.

The largest trade is carried on in cotton, the exports of which in the last four years have been valued as follows:—

	Rs.
1874–75 - - -	2,12,92,260
1875–76 - - -	1,62,90,970
1876–77 - - -	2,25,65,883
1877–78 - - -	2,27,99,291

The trade in wheat and oil-seeds for export to Europe is on the increase, although it has been interfered with during the past two years by the famine traffic on the line.

The total trade of the province, including road-borne traffic, the returns of which are, however, very incomplete, is reported to have been as follows:—

	Imports. Value. Rs.	Exports. Value. Rs.
1877–78 -	2,48,26,652	3,77,07,998
1876–77 -	2,36,01,790	4,81,56,310

The actual traffic by railway, the route by which the chief trade of the province is carried on was as follows:—

	Imports. Rs.	Exports. Rs.
1877–78 -	1,91,63,583	3,38,28,313
1876–77 -	1,91,57,244	4,49,34,564

The falling-off of the exports noticeable in the figures is due to the abnormal traffic of 1876–77 in grain to the famine-stricken districts of Southern India having ceased.

Trade Returns.

The total trade of the province, including road-borne traffic, the returns of which are, however, very incomplete, is reported to have been as follows:—

	Imports. Weight Maunds.	Value. Rs.
1877–78 - -	2,227,253	2,48,26,652
1876–77 - -	2,094,850	2,36,01,790

[NOTE.—The figures for 1876–77 include articles recorded both by weight and numbers, but in 1877–78 these have been kept distinct, and the above figures for the latter year show the weight only.]

In addition to them the following articles were imported in 1877–78 by numbers:—

Animals - - - -	26,666
Cows - - - -	1,433
Earthenware - - -	9,400
Cocoa-nuts - - -	61,836
Mats - - - -	3,484
Timber - - - -	95,299
Firewood - - - -	165,724
Bamboos - - - -	114,803
Horns - - - -	8

EXPORTS.

	Weight in Maunds.	Value Rs.
1877–78 - - -	*4,054,911	3,77,07,998
1876–77 - - -	6,088,785	4,81,56,310

*In addition, articles were exported by numbers as follows:—

Animals - - - -	10,520	Timber - - - -	55,465
Earthenware - - -	101	Firewood - - -	4,324
Cocoa-nuts - - -	178,379	Cows - - - -	16
Skins - - - -	396	Chineseware - - -	112
Mats - - - -	714	Leather - - -	36

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BERAR.
Ir. Dunlop.

The actual traffic by railway, the route by which the chief trade of the province is carried on is, was follows:—

IMPORTS.

1877-78.

			Weight in Maunds.	Value Rs.
			1,454,194	1,86,76,991
Animals	97	Numbers	*31,887	4,86,462
Cocoa-nuts	31,720			
	*31,887	Total -	1,486,081	1,91,63,383

1876-77.

		Weight in Maunds.	Value Rs.
Numbers	-	1,226,452	1,91,57,244
Total	-	1,226,452	1,91,57,244

EXPORTS.

1877-78.

			Weight in Maunds.	Value Rs.
			3,531,699	3,38,17,932
Animals	21	Numbers	*590	10,381
Cocoa-nuts	569			
	*590		3,532,289	3,38,28,313

1876-77.

		Weight in Maunds.	Value Rs.
Numbers	-	5,375,003	4,49,34,564
Total	-	5,375,003	4,49,34,564

The chief features of the trade of the province are exhibited in the following table, which is taken from the last Trade Report by the Commissioner, Hyderabad Assigned Districts :—

Articles.	Imports, Weight.	Exports, Weight.	Excess.		Remarks.
			Imports.	Exports.	
Sheep and goats - -	16,328	2,935	13,393	—	Mostly from the south.
Cotton - - -	188,144	1,699,739	—	1,511,595	Nearly all borne produce.
Twist and yarn, European -	51,709	11	51,698	—	All railway borne from the west.
Piece goods, European -	24,746	4,278	20,468	—	By far the greater part enters by Raja Deulgaon.
Do. Native - -	42,922	41,976	946	—	Imports chiefly from the east; exports to the south.
Wheat - - -	152,782	98,492	54,290	—	Imports 90,000 maunds, railway borne. „ 30,000 „ eastern frontier. „ 19,000 „ southern frontier. Exports 38,000 „ railway borne. „ 46,000 „ southwards.
Gram and pulse - -	10,718	—	10,718	—	All from the Narbada Valley.
Rice - - - -	270,873	25,048	245,825	—	Imports 216,905 maunds, railway borne. „ 44,004 „ eastern frontier. „ 174,000 „ railway borne. „ 31,879 „ eastern frontier.
Other rain crops - -	246,923	1,592,954	—	1,346,031	„ 23,434 „ southern. Exports 1,460,000 „ railway borne. „ 100,000 „ eastern frontier.
Hides of leather -	8,180	748	7,432	—	From the south.
Skins of sheep, &c. - -	30	119	—	89	
Horns - - -	2,966	5,721	—	2,755	Railway borne ; must be all produce of Berar.
Lac dye - - -	4,371	8,683	—	4,312	Import, railway borne; export, do.; difference must be Berar produce.
Brass and copper - -	3,472	1,738	1,734	—	Import from east chiefly.
Iron - - - -	—	—	—	—	No trade to speak of recorded.
Other metals - -	113,618	6,632	106,986	—	Import almost all by railway.
Oils - - - -	8,564	1,811	6,753	—	Import from south and west.
Opium - - -	3,963	3,276	687	—	Import 3,963 maunds, railway borne. „ 8 seers, southern frontier. „ 2 „ western frontier. Export 2,412 maunds railway borne. „ 330 „ eastern frontier. „ 534 „ southern frontier. „ 1 seer, western frontier.
Ghee - - -	14,362	19,685	—	5,323	
Salt - - - -	371,189	33,776	3 37,413	—	Export to east and south chiefly.
Silk, raw - - -	4,026	1,020	3,006	—	Import all by rail.
Spices - - -	20,252	2,512	17,740	—	Railway import 11,000 maunds, southern frontier 3,915, eastern frontier 3,791 maunds.
Sugar, refined - -	5,379	4,256	1,123	—	Nearly all imports railway borne, but refined and unrefined not distinguished.
Do. unrefined - -	191,569	2,345	189,224	—	
Tobacco - - -	4,314	19,135	—	14,821	Exports 9,262 maunds, eastern frontier.
Oil seeds - - -	64,720	333,763	—	269,043	It is impossible to distinguish the different kind of oil seeds with accuracy, so I have not attempted it: nearly all export was by rais. Imports came chiefly from the north and south.

BOMBAY.

Kaira.—Trade is brisk and the trading class energetic. Kaira exports grain, tobacco, ghee, oil, and timber. The Collector gives the grain traffic in 1876 as

	Tons.	
Exports - -	21,344	
Imports - .	1,432	(Probably rice for the rich.)

He estimates the export of tobacco at 7,292 tons. The recent opening of railway feeders has done much to develop trade. Kaira imports piece-goods, sugar, iron, timber, twist, and many other things.

Broach.—There is an active trade in raw cotton, the value of cotton exported in 1874 being 1,376,508*l.*, for preparing which there were 31 steam factories, *i.e.*, gins, presses, and spinning mills. Broach also exports wheat to Bombay and millet to Kattywar and Katch. The grain export was valued in 1874 at 25,245*l.* Broach imports gram, rice from Thana, metals, sugar, piece-goods, and timber. The gross imports in 1874 were valued at 616,177*l.*, of which 255,330*l.* was the value of commodities consumed in the district.

Surat.—There is a large export of raw cotton, timber, and grain, and import of metals and piece-goods. There are two spinning and weaving factories at Surat. The manufactures are common and fine cloth, silk, brocade, embroidery.

Thana.—The district is poor and the trading class insignificant. The exports are rice, salt, and timber. Thana grows its own food supply. The import trade is small.

Colaba.—There is not much trade and no energetic trading class. Colaba subsists on its own resources.

Khandesh.—Commerce not very brisk. The trade is chiefly conducted by merchants from Bombay, who have of late years established firms for the exportation of grain, cotton, and seeds, which form the chief articles of trade. Khandesh grows its own food supply and stores or exports a surplus. Timber is exported from the Dang forests. The imports are metals, cloth, and groceries.

Nasick.—Is an agricultural district. The grain trade is chiefly for local wants, but there is some export by rail to Bombay. The district grows much more grain than it consumes. The Collector mentions no other trade or industry.

Ahmednagar.—No information offered by the Collector. The products are (1) bajra, (2) joár, (3) oil seeds, (4) wheat, and a very trifling crop of cotton. The circumstances are probably the same as those of Nasick.

Poona.—There is no trade in the Poona district except in grain. The surplus over consumption is exported to Bombay, but not much wheat or oil seeds are grown and scarcely any cotton. The imports are metals, piece-goods, and salt.

Sholapur.—The Collector says, "trade is active "and the traders enterprising. There is a constant "flow of trade." But he does not say in what. Sholapur produces a trifling crop of oil seeds and a less one of cotton. The other products are chiefly millets, which are largely exported towards both Bombay and Madras.

Satara.—There is little or no commerce and no enterprising trading class. The grain is chiefly grown for consumption. Satara exports molasses, pepper, and a little cotton, and imports rice, salt, cocoanuts, and dried fish. The trade is with the coast.

Kaladgi.—Considering the isolated position of the district, the trade is fairly active. The cotton grown in the south part finds its way to the coast, and wheat grown in the valley of the Done is exported to Sholapur and elsewhere. In return come rice, salt, piece-goods, and silk. The produce of the silk and cotton looms in the south has a wide reputation, and the manufactures are exported into the Nizam's dominions and Madras. Except a few large firms, the traders only operate locally. Communications require to be improved. In the south and south-west large quantities of grain are stored in good years, because it would not pay to export it.

Dharwar.—Commerce is active and the traders energetic. The district supplies its own food in average years. Cotton is exported to the coast, but the carts return empty, and the imports are few. Grain is imported when prices are high.

Canara.—The traders are few, but well-to-do and fairly active. There is an export trade in areca nuts, cardamoms, pepper, and rice, and the imports are salt, grain, and piece-goods.

Ratnagiri.—Trade is active with the Deccan and with Bombay from the large towns and at the heads of the tidal rivers. The local trade consists in importing and distributing grain for consumption, and exporting salt-fish, shell-lime, and cocoanuts. No part of the district subsists on its own resources.

With reference to this question and question 3 above, the information of the Collectors as to disposal of the produce of their districts and the amount of imports consumed, seems vague and incomplete. The following tables may be of use. They show the export and import of food grains from and into the districts which are traversed by the railways in 1873 and the first half of 1874. This will be chiefly their own produce exported, and rice or wheat imported for the food of the wealthier classes, or common grain imported where the local production fails.

BOMBAY, BARODA, AND CENTRAL INDIA RAILWAY.

STATEMENT showing Quantity of Food Grain, Outwards and Inwards, at each of the Collectorates, for the Half-Years ended 30th June and 31st December 1873 and 30th June 1874.

Half-Years.	Bombay Collectorate.		Tanna Collectorate.		Surat Collectorate.		Broach Collectorate.		H. H. the Guicowar's Territory.		Kaira Collectorate.		Ahmedabad Collectorate.		Kattiawar.		Other Lines.		TOTAL.
	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
June 1873 - -	1,742	2,516	303	85	1,905	6,890	1,038	1,144	380	2,494	4,566	561	6,058	1,397	13	1,454	914	378	16,919
December 1873 -	782	2,217	117	110	1,562	1,454	1,373	540	343	2,620	388	1,115	4,421	850	113	945	1,266	514	10,365
June 1874 - -	323	2,207	654	202	3,212	4,782	897	1,435	237	4,232	2,635	1,072	7,297	1,592	16	1,588	2,154	315	17,425

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BOMBAY.

Mr. Peile.

G. I. P. RAILWAY.

STATEMENT showing Quantity of Food Grains, Outwards and Inwards, at each of the Collectorates, for the Half-Years ended 30th June to 31st December 1873 and 30th June 1874.

Half-Years.	Bombay Collectorate.		Tanna Collectorate.		Nasick Collectorate.		Khandesh Collectorate.		Poona Collectorate.		Sholapur Collectorate.		Other Lines.		TOTAL.
	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	Outwards.	Inwards.	
June 1873 -	4,526	752,334	35,739	44,369	255,724	31,464	33,046	141,223	10,272	284,377	228,250	8,326	129,109	81,622	
December 1873	4,580	851,588	18,314	35,853	246,671	19,991	27,610	67,103	17,248	203,695	189,759	8,639	23,989	272,544	
June 1874 -	801	1,491,441	14,232	58,095	839,107	13,416	90,759	54,113	26,021	107,295	422,387	8,250	3,328	1,584,901	

NOTE.—The figures here are maunds of 80 lbs. each.

With these tables may be compared the following figures for 1876–77 :—

On the G. I. P. RAILWAY, 1876–77.

	Bombay.		Thana.		Nasik.	
	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.
Food-grains in tons -	36,314	267,166	7,675	7,542	19,920	18,154

	Khandesh.		Poona.		Sholapur.	
	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.
Food-grains in tons -	11,703	19,158	14,478	91,418	23,796	57,924

On the B. B. and C. I. RAILWAY, 1876–77.

	Bombay.		Thana.		Surat.	
	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.
Grain and seed (tons) -	2,281	46,762	1,435	1,259	8,619	24,545

	Broach.		Kaira.		Ahmedabad.		Kattywar.	
	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.
Grain and seed (tons)	3,222	15,832	23,653	3,333	73,438	9,350	556	4,718

MADRAS.

Board of Revenue.

MADRAS.

An idea of the extent and character of the traffic carried on by rail may be gathered from the following :—

STATEMENT showing the Traffic on the Madras Railway during the Years 1875, 1876, and 1877.

Articles.	1875.	1876.	1877.
	Tons.	Tons.	Tons.
Cloth - - -	5,802	5,568	4,403
Coffee - - -	4,948	6,049	4,165
Cotton - - -	30,626	23,493	1,686
Grain - - -	7,076	38,640	495,110
Gram - - -	24,558	40,715	57,803
Iron - - -	8,999	9,458	8,435
Jaggery - - -	9,390	7,272	7,580
Paddy - - -	6,504	14,982	25,997
Ragi - - -	9,376	22,180	16,462
Rice - - -	75,180	101,326	129,764
Salt - - -	48,034	51,513	58,656
Sundries - - -	149,581	158,400	150,362
Timber - - -	17,342	15,164	10,729
Twist - - -	4,393	5,006	3,822
Railway materials -	797	887	1,631
Harbour do. -	13,055	114,886	14,875
Total - -	415,656	615,539	991,480

STATEMENT showing the Traffic on the South Indian Railway during the Years 1875 to 1877.

Articles.	1875.	1876.	1877.
	Tons.	Tons.	Tons.
Areca nuts - -	2,379	3,196	2,656
Cloth - - -	2,308	4,075	2,772
Cotton - - -	—	878	1,027
Curry-stuffs - -	4,628	7,079	5,674
Fruits and vegetables -	2,410	2,961	4,095
Grains of all kinds -	42,067	70,772	232,998
Granite stones - -	8,170	18,619	41,316
Oil and ghee - -	2,122	3,215	2,282
Oil-cakes - - -	2,640	6,124	5,985
Salt - - -	11,570	16,527	21,045
Seeds of all kinds - -	7,508	11,609	9,994
Sundries - - -	22,271	30,893	41,479
Tobacco - - -	893	1,154	2,002
Hides - - -	1,213	1,637	2,339
Total - -	110,179	178,739	375,664

No statistics are available with regard to the traffic by road.

A difficulty arises in determining the standard of activity and enterprise by which the trading class of each district is to be tested. Most Collectors answer

MADRAS.

Board of Revenue.

the question in the affirmative, and it seems probable that some of those who have not done so have taken a different view of what constitutes activity and enterprise in a trading community. The experience of the late famine has tended to show most conclusively that, under very diverse conditions and most difficult circumstances, the ordinary traders of the country are able to organise and carry on an entirely new trade with very decided general success, and the Board consider that they are warranted in saying of the Presidency generally that it has an energetic and enterprising trading class. From the census tables of 1870-71 it appears that 3·4 per cent. of the male population were returned as engaged in trade. Many Collectors testify specially to the energy of the Mahomedan traders, and with regard to the Hindu commercial castes, Dr. Cornish, the compiler of the census tables, remarks: "They have not the whole field to "themselves; for many Mahomedans and Hindus of "other castes are now competing with them; but "they hold their own as communities possessing "capital, gifted with the spirit of enterprise and free "from the vice of personal extravagance, must always "do."

The proportion of traders to the male population in the different districts was as under:—

Ganjam - - - -	4·9
Vizagapatam - - -	4·2
Godavari - - -	4·0
Kistna - - - -	3·9
Nellore - - - -	4·3
Cuddapah - - -	3·4
Bellary - - - -	3·4
Kurnool - - - -	4·1
Chingleput - - -	2·3
North Arcot - - -	3·5
South Arcot - - -	2·2
Tanjore - - - -	3·6
Trichinopoly - - -	2·6
Madura - - -	3·4
Tinnevelly - - -	3·8
Coimbatore - - -	2·8
Nilgiris - - -	3·0
Salem - - -	2·3
South Canara - - -	2·4
Malabar - - -	3·3
Madras - - -	7·8

In ordinarily favourable years most of the districts of the Presidency subsist mainly on their own resources as far as regards the staple food of the population, but there is a steady ebb and flow as regards other agricultural produce, salt, piece goods, metals, &c. &c.

MYSORE.

MYSORE.

Traders always have been very active in this part of the country—there are numbers of the trading classes in all large towns. They are as a rule intelligent, energetic, and enterprising people, and they were quite equal to the occasion during the famine. Prior to the famine the trade in grain, cocoa-nuts, betel nuts, tamarinds, chillies, and jaggery, all of which are Mysore exports, was most brisk and encouraging, and the ebb and flow of trade was all that could be desired. The import of salt, iron, cotton, vegetable oils, ghee, and the precious metals was in those days very considerable, but during the prevalence of the famine, the whole character of the imports changed, and grain took the place of everything else.

RAJPUTANA.

RAJPUTANA.

ain Barr

Captain Barr, Marwar.—There is but little activity of commerce in this province. Marwar is well known as the birth-place and home of perhaps the most enterprising class of natives, but the Marwaris who enrich themselves by mercantile operations in other parts of India do not do much good to their native country. It is true that their love of home is strong, and that many of the wealthiest Marwari merchants, who have their places of business in Bombay, Calcutta, Malwa, the Deccan, Madras, and even in China, return periodically to Marwar, some to marry, others to give their sons and daughters in marriage, and many to end their days in their native country; but the energy and enterprise of these Marwari merchants is expended in other countries and the benefits of their habits are alienated from Marwar. The country itself has but little trade. Most of the districts are self-supporting, and it is only in years of scarcity that grain is imported. In years of unusual abundance grain leaves the country, but taking the average, it may be assumed that export and imports are small, and the ebb and flow of trade is neither active nor constant.

Major Powlett, Kotah.—Kotah has only two considerable resident merchants; but it has branches from large foreign houses. Its chief exports are grain and opium; and its imports English cloth and spices.

The same may be said of Boondee. But the latter exports more to the north; Kotah more to the south. In times of scarcity, notwithstanding engagements to the contrary, the export of grain is checked in all native states. It is, however, forbidden by Government so far as it directly affects the grain-supply of cantonments. Practically, less harm to outlying districts is done by the temporary restriction than would be supposed; for merchants in times of plenty establish stores of grain in British territory, whence they can be moved freely where wanted.

CENTRAL INDIA.

CENTRAL INDIA.

Mr. Winga

Bhopal.—A large export trade in opium, cotton, jaggery, and grain.

Baghelkhand.—No commerce except at Sutna, where salt and piece goods are extensively imported, and wheat, ghee, and linseed exported.

Rutlam.—Opium, cotton and oil seeds are exported to Bombay.

Bhopal.—A metalled and bridged road to G. I. P. Station at Etarsee. Carts are used in dry season, and at other times pack-bullocks.

CHAP. I. QN. 18.

CHAPTER I.—QUESTION 18.

What are the facts in your province as regards the means of communication? Do bridged and metalled roads connect all the important centres of trade that should be thus connected? Are the roads in good working order, and sufficient for the traffic on them or not? Are they open through the year, or closed for wheeled-traffic in the rains? Is the ordinary means of conveyance by wheeled carriage, or by pack-bullocks; and if by wheeled carriage, is there a sufficient number of carts in the district for all its wants? What is the ordinary cost per mile of conveying one ton of merchandise either by wheeled or by pack-carriage?

PUNJAB.

Major Wace.

PUNJAB.

I append a return of the roads in the province completed to 31st March 1878, which has been furnished by the Public Works Department. It shows that the total length of these roads was on that date—

	Miles.
Metalled and bridged - -	1,255
Partially " " - - -	664
Unmetalled - - -	20,030
Total -	21,949

The principal lines of road are shown in a skeleton map (scale 32 miles to an inch) which faces this report. It would not be practicable to show every road on so small a map.

Metalled roads.—The principal one commences at Delhi; and thence runs in a north-westerly direction through Lahore to Peshawar, traversing in its course the richest and most populous tracts of the province. Before the railways were constructed, this road was of the greatest value. And though the railways now relieve it of its heaviest traffic, it is still desirable to keep it up. Its total length is 579 miles. The next in importance are:—the road from Delhi to Sirsa, as yet only partially metalled, 165 miles; that from Delhi towards Mathra, 46 miles; from Amballa to Simla, 92 miles; from Ludhiana viâ Ferozepur to Lahore, 141 miles; from Amritsar to Pathânkot, 68 miles; and from Wazirabad to Sealkot, 30 miles. These roads are usually made of rammed kankar,* width and cost as noted at the end of this reply.

Unmetalled roads.—Each district is thoroughly intersected with roads of this class; and so far as the funds of district committees permit, they are bridged. The cost of construction and maintenance is small; and from the first years of our administration in the Punjab great attention has been paid to the connection of all places of importance in each district by roads of this character. Besides the roads thus returned, which are principally roads constructed and improved since annexation, there are great numbers of village roads all more or less suited to the local traffic. In short, so far as rough roads are concerned, those existing in every district much more than meet present local requirements.

Bridges and ferries.—The main rivers of the Punjab are of such width and volume, and their channels so shifting, as to make the erection of permanent bridges over them for the ordinary traffic of the country a task far beyond the present financial resources of the province. The place of such bridges is however efficiently supplied by temporary boat bridges on the main lines of traffic, and by ferries at the less important lines. The boat bridges are erected in September, and usually stand till April, May, or June, when they are dismantled. The rivers swell so greatly with the summer melting of the Himalayan snows, and the floods of the autumn rains are so high, that it is not practicable to maintain such bridges on the larger rivers between June and September. The traffic is slack in these months; and so much as there is, is ferried across in boats. As regards the bridging of the minor drainage channels of the country, it may be stated generally, that great progress has been made, and that the shortcomings still existing are not such as to cause any material hindrance to trade, nor can they be very rapidly supplied in the existing state of the local revenues.

Are the roads in good working order, and sufficient for the traffic on them or not? Are they open throughout the year, or closed for traffic in the rains?—The first of these two clauses may be briefly answered in the affirmative. It is not thereby meant that there is no room for improvement, nor desire to improve existing communications. On the contrary, both the Government and the District Committees pay continuous attention to the matter. But there is no part of the province in which any crying want exists, or which is not, roughly speaking, very well supplied with all necessary roads.

As regards the second clause, the roads may be stated roughly to be open throughout the year. The Punjab rains are not so heavy as those of Eastern and Southern India. Carts can work on the metalled roads all the year round; on the unmetalled roads also they can work, except for a few days after a heavy rainfall. Camels cannot work in rainy weather, their feet being unsuited for wet ground; they are also out of condition during the autumn rains, and it is consequently unusual to load them then.

Tolls.—The roads of the country are free of all tolls, except at the ferries and boat bridges on the larger rivers. Small dues are levied at these points; The proceeds yield a surplus over and above the cost of maintaining the boat bridges and ferries; which is added to the local rates paid by the landowners of each district, and aids in the maintenance of the roads. The only road toll-bars in the province are one on the hill road to Murree, and two on the hill road to Simla and its prolongation towards Tibet; all three entirely exceptional cases, justified by the great cost of these roads and by the exceptional benefits they confer on those who use them.

Is the ordinary means of conveyance by wheeled carriage or by pack-bullocks? and if by wheeled carriage, is there a sufficient number of carts in each district for all wants?—The ordinary means of con-

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* Kankar is usually described as nodular limestone, and is a calcareous deposit plentifully found in beds some four or five feet below the surface of the land in loamy soils in most of the submontane districts. It forms a description of limepan, and the soil is greatly benefited by its removal. It is usually composed ¾ of carbonate of lime and ¼ of silica and alumina, in nearly equal proportions. (Ansted's Elementary Geology, p. 349.)

CHAP. I. QN.

PUNJAB.

Major Wac

veyance is by bullock-hackerie in the districts east of Lahore, and by camel in those west of Lahore.*

In the four western divisions of the province, (Rawalpindi, Peshawar, Multan, and Derajat), there is hardly any wheeled carriage; of 97,909 carts, only 2,789 belong to these divisions. On the other hand, the three divisions of Rawalpindi, Multan, and Derajat contain 120,117 out of the total estimated number (165,567) of camels belonging to the province. Camels are also largely used in the Hissar division, which possesses 25,589 of these useful animals.

There are no indications that the supply of carriage is insufficient. On the contrary, the camel drivers complain that they cannot get so much work as before, and attribute this to the development of the railways. Though reared, owned, and usually pastured in the dry western tracts of the province, they work much in the eastern districts; and no doubt, as regards these districts, the railways have largely supplanted them. In the hill districts of Hazara and Kangra the carriage is mostly by pack bullocks and mules. The statement appended, showing the carriage of each district, is taken from the Punjab Administration Report for 1876–7.

What is the ordinary cost per mile of conveying one ton of merchandise, either by wheeled or packed carriage?—The only wheeled carriage in the province of importance to trade are bullock-hackeries; the only pack-carriage, camels. I, therefore, confine my reply to these two descriptions of carriage. In a statement appended I have collected the rates charged on the most important roads in the province; but the rates charged by carriers depend so much on the dulness or briskness of local trade, that some discrimination is needed in applying the results shown in this statement. There does not seem to be any material difference between the cost of carriage by camels and by carts. The rates appear to vary generally between 1½ and 2½ annas per ton per mile. The higher rate and rates exceeding 2½ annas are more frequent on unmetalled roads than on metalled roads; but the schedule does not show so much difference between the charges on these two classes of roads as would have been expected. Some of the cheapest rates occur on roads which are railway feeders, where no doubt the demand for carriage is steady.

It is worthy of note, that the rates for carriage supplied by civil officers to troops (which were purposely fixed some years ago after considerable inquiry at rates more liberal than those usually paid by private employers), worked out to a rate per ton per mile, yield a rate of 3½ annas for bullock-hackeries, and 2⅓ annas for camels. I mention this as these rates are the outcome of an investigation entirely independent of that under report; and allowance being made for the higher rates necessarily paid for carriage supplied to troops, as well as for the fact that food grains are usually carried at the cheapest rates practicable, the results of the two inquiries fairly correspond.

Cost of roads.—The following details concerning the sums annually spent on roads in the province will be interesting in connection with this subject. During the three years ending 1877–8 the average sums spent each year on roads were:—

	Rupees.
On construction of new lines -	5,08,526
On repairs and maintenance of new lines - - -	11,02,269
Total -	16,10,795

Of this total sum Rs. 6,60,266 was spent directly from district funds by the district committees; and the balance, Rs. 9,50,529, was contributed from the general local fund and provincial revenue.

Metalled roads.—The road surface varies from 30 to 40 feet; of which from 10 to 16 feet are metalled; the most common width of metalling is 16 feet. The cost of construction varies largely according to circumstances. The roads with the heaviest traffic, constructed by the engineers of the Public Works Department, cost (omitting the larger bridges) Rs. 10,000 per mile.

The smaller roads and roads with less traffic constructed by district committees and civil officers cost from half to three-fourths of this sum. Repairs and maintenance cost on the former class of roads from 500 to 800 rupees per mile; on the latter they are usually less than Rs. 300 per mile per annum.

Unmetalled roads.—The cost of construction varies according to the amount of bridging required by the nature of the traffic.

The rough country road, which is ordinarily sufficient for the interior traffic of a district, can be well made for Rs. 300 a mile, and maintained for Rs. 30 a mile per annum. The better class of unmetalled road, carrying much traffic, cost from Rs. 60 to Rs. 300 a mile to maintain; the average annual charges on 15 such roads gives Rs. 120 per mile.

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* To this statement I should note one exception. Carts, owned most of them by natives of districts east of the Ravi, work in great numbers on the metalled grand trunk road between Lahore and Peshawar.

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Roads.— A first-class road is one which is raised above the level of the country, bridged and metalled. A second-class road is one which is raised and bridged but not metalled, the roadway being on the ordinary soil of the country. But although classed as "bridged," most of these roads are interrupted by the larger rivers of the provinces, and the bridges are only over the smaller streams or watercourses which cross them.

For all roads which do not follow [illegible] of the main rivers, the streams of the Go[illegible]mna, and Betwa offer serious interrupt[illegible]

The Jumna is crossed b[illegible] at Allahabad, Delhi, and on the [illegible]ove Sahåranpur; at the two forme[illegible]re furnished with subways for[illegible]ic. Permanent pontoon bridges[illegible]at Muttra and Agra, and a t[illegible]s lately been constructed at[illegible]s crossed by railway bridges at Rajghát and at Cawnpore; at the latter place there is a subway for traffic. At all other points where roads of any importance meet the Jumna and Ganges, and at *all* points where such meet the Gogra and Betwa, a bridge of boats is only maintained during the cold and hot weather months, when the water is low. Above the Aligurh district such temporary bridges are very numerous across the Ganges, but below Cawnpore it is only bridged in this way at two or three places, the chief of which are Allahabad and Benares. The Gogra is not bridged at all below Fyzabad.

During the rains, therefore, most of the first-class roads are interrupted where they meet any of these rivers and traffic, and passengers have to cross by ferries.

The provinces are well provided with first and second class roads, except perhaps along the margins bordering on the Himalayan and Vindhyan hill ranges

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There is a third class of road, which includes roads unmetalled and unbridged, which are also maintained by Government. These are not shown in the map, but are in some districts very numerous and serviceable in fair weather. The character of the country in the Ganges Jumna Doab, flat and dry, except in the rains, allows of cart-traffic travelling along almost any kind of road, bridged or unbridged, for some seven or eight months of the year, and, though in the rains unmetalled roads may get swamped and unbridged roads blocked by streams, yet in no case is there such necessity for either bridging or metalling as in the damper tracts north of the Ganges and Gogra. Third-class roads are however better in the easterly districts, where there is less sand and the soil is firmer and more consistent than in those towards the westerly end of the provinces. The best metalling is made of kankar, a form of carbonate of lime, which occurs in irregular deposits, a few feet below the surface of the ground. Kankar is found in more or less profusion throughout the Doab districts, but is far less common in the damp and waterlogged tracts, where its need is most felt. In the sub-Himalayan districts its place is sometimes supplied with stones, broken small, generally obtained from the bed of some stream or mountain torrent. For this reason it will be noticed that first-class (or metalled) roads are far less common in districts in the two northern of the belts described in the answer to *query* 3, than in the southern belts.

The tracts which lie immediately under the Himalayas are much intersected by narrow streams called "*sots*," which always need bridging, as well as by torrent beds, dry during eight months of the year, but filled with rushing water in the rains, which, if a road is to be passable all the year round, must be also bridged. Nothing but the most solid and carefully constructed masonry can stand the violence of these torrent streams. Between the town of Najíbabad (in the Bijnor district) and Hardwár there are some 18 miles of road, on which the ruins of no less than six masonry bridges may be seen, which once spanned torrent beds, now impassable in the rains, though completely dry at other times.

The difficulty of using unmetalled roads in districts bordering on the Punjab, owing to the prevalence of sand, has been already implied. Their condition, if anything, improves in the rains, for the simple reason that wet sand is more consistent than dry. In Bundelkhund, and along the edge of the provinces which is fringed by the Vindhyan range, there are difficulties as great or greater than those in the sub-Himalayan tract. The torrents of the Betwa and other streams can in the rains only be crossed with great difficulty by means of ferries, the former river often almost completely cutting off the Lalitpur district from communication with the rest of the provinces. Another difficulty with Bundelkhund roads lies in the soil. The black earth known as "*már*" or "cotton soil" is common there, which in the rains becomes thick tenacious mire, making unmetalled roads running over it quite impassable, not only for carts, but also for pack-animals. The deputy commissioner of Jhánsi writes that even on unmetalled roads:

"Traffic is much hindered by the unbridged rivers, more particularly the Sindh, Betwa, and Dhasán, which in times of high flood are often impassable for days together. The earthwork of the gháts also is always liable to be cut away, making them very difficult for the passage of carts. The unmetalled roads in the district are practically closed for wheeled traffic throughout the rains, and those which pass through black soil are often impracticable for pack-bullocks."

It appears, therefore, that in the rains little or no traffic is possible in the tracts which lie near the Himalayan or Vindhyan hill ranges, for even the roads classed as bridged are there often interrupted by unbridged rivers or streams. In the districts which lie between those tracts, traffic is possible during the rains on fisrt-class or metalled roads with ease, where such do not meet any of the larger unbridged rivers at points other than Muttra, Delhi, Agra, Allhabad, or Cawnpore, and with difficulty when any of these rivers has to be crossed by ferry.

The means of conveyance vary with the character of the country. In the districts which lie along the centre of the provinces, bullock-carts (or "chakras") are most commonly used. The pattern on which these are constructed differs but little throughout these districts, and the load carried in them varies according to the number of bullocks and the class of road they are to travel over. The most usual loads average 10 or eight maunds for each pair of bullocks employed in drawing.

These carts go from 12 to 16 miles a day; at night they halt in camping grounds, which are set apart for this purpose at intervals along the more frequented roads. The charges for carriage are not, as a rule, calculated on the mileage with any pretence at accuracy. There is in each place a series of fixed fares to and from all other places with which there is much cart traffic.

The following are a few of the fares from Mainpuri:—

	Distance. Miles.	Rate per maund. Rs.	a.	p.	Per ton per mile. Rs. a. p.
To Etáwah	- 35	0	3	0	0–2–4
Farukhabad	- 40	0	3	0	0–2–4
Cawnpore	- 107	0	6	0	0–2–0
Mainpuri	- 310	1	0	0	0–1–5

The rates for carriage per ton per mile quoted in the district replies would all appear to be merely calculated from these customary fares, and vary from Re. 0-1-9 in Ghâzipur to Re. 0-3-9 in Jhánsi. Generally speaking, the fares are lower in the districts situated in the central belt, where metalled and bridged roads are common, than in the border tracts, where the communications are less favourable. In some districts they vary with the season and with the class of road to be travelled over; thus in Jhánsi the usual rates are given as Re. 0-2-6 for metalled roads and Re. 0-2-9 for unmetalled, which in the rainy season are raised to Re. 0-3-6 and Re. 0-3-9 respectively. The average rate for cart carriage may then be put at Re. 0-2-7 per ton per mile.

From the district replies it appears that in each district there are enough carts for ordinary transport purposes. Their numbers are, however, considerably diminished by every new line of railway which competes with the roads they ply on. The collector of Jaunpur writes on this subject:—

"I am informed that the introduction of the railroad has had the effect of diminishing the number of carts. Last year, when traffic was choked at Benares, I inquired of some merchants who wished to send grain towards Bombay why they did not take it in carts to Allahabad, and was told that carts could not be obtained."

Not only is the cost of carriage by cart very much in excess of that by rail, but there are numberless risks from which goods carried by rail are free, and must be held to add to the total expense. Besides the risk of loss from exposure to the weather, from theft, or the dishonesty of the cartmen, there is another danger arising from the length of time taken in the journey; prices may change, and a sudden fall may ruin the venture altogether.

As stat[illegible]fore, the conveyance of goods on pack anima[illegible]nest on the borders of the provinces. To[illegible]b, where the ground is sandy and car[illegible]difficulty, camels are not uncommon, wh[illegible]om the Punjab and Rajputana to th[illegible] the Meerut division. In this pa[illegible]nkeys are also commonly employed [illegible]l trade, each animal carrying a[illegible]llocks are the means of con-[illegible]jārás, the itinerant grain and [illegible]India. These men do some

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trade with the Bundelkhund districts, and in them bullocks are the pack-animals most commonly used. Bullocks are employed, but less generally, throughout the provinces, the rates per ton per mile given by district officers varying from Re. 0-3-0 (Jhánsi) to 0-4-4 per mile.

On the Nepal and Kumaun frontier ponies are the pack-animals chiefly employed. The collector of Gorakhpur states that pack bullocks or buffaloes are but little used, and estimates the rate for pony carriage as Re. 0-4-0 per ton per mile. When the carriage is in the Hills themselves the rates are greatly increased, and the labour of coolies is much employed. The Dára pass leading into the Gonda district is only practicable for coolies, and in Kumaun and Garhwál coolies, with mules and ponies, are the ordinary means of conveyance, the estimated rates being Re. 1-3-0 per ton per mile for the latter and Re. 1-7-0 the former.

Sheep are employed in carrying goods between Kumaun division and Thibet, being the only pack-animals which can be used with safety in crossing the difficult snow passes.

The following are the average loads carried by each of these different means of conveyance:—

Bullock-cart - -	10 mds. to 50 mds.
Camel - - -	5 "
Buffalo - - -	5 "
Bullock - - -	3 to 4 "
Pony - - -	3 "
Donkey - -	2 "
Coolie - - -	1 maund.
Sheep - - -	10 seers.

BENGAL.

BENGAL.

Mr. Toynbee.

The state of communications in the province by rail and river has been fully explained in the answers to questions 19 and 20. As regards roads, it will be best elucidated by a reference to the accompanying statement. It will be seen that the number of "all-weather," or "bridged and metalled," roads is but small compared with the mileage of "fair-weather" roads. The physical conditions of the province render bridging and metalling impossible to any large extent, not only on account of the original expense that would be incurred in their construction, but also by reason of the heavy cost of maintenance. Roads in Bengal are, generally speaking, feeders to rail or river. The traffic on them is greatest in the dry months, after the great winter rice-harvest of the year has been gathered in and threshed out, so that metalled roads are not required for any but the principal routes. For pack-bullocks and ordinary carts, the ordinary "fair-weather" road is all that is necessary. Since the introduction of the Road Cess Act the funds collected under its provisions are spent solely and entirely within the district which provides them. Each district has its own engineer and subordinate engineering establishment working under the general control of the district officer. The result has been that new roads have been made in every district strictly in accordance with its own wants, and by degrees no part of any district will be left unprovided with such communications as will ensure the full and free flow of such inward and outward traffic as the conditions of the season may demand. In the hilly portions of the province, and in such parts of the interior as have not yet been provided with roads, the traffic is chiefly by means of pack-bullocks; whenever there are good roads and near large towns it is by cart. The number of carts always increases with the increase of facilities of communication. Pack-bullocks and carts together, each district has quite enough for all its ordinary requirements. It would not, of course, be possible to keep up a reserve of either to meet any extraordinary pressure. The experience of 1874, which is a very extreme case, shows that means of transport are always forthcoming when they are wanted. On a rough estimate, the cost per mile of conveying one ton of merchandise by cart ranges from three to four annas, and by pack-bullocks from one to two annas. These are the rates charged to outsiders; to those who carry their own grain to market by means of their own carts or bullocks the cost would, of course, be merely nominal.

STATEMENT showing the NUMBER of MILES of PROVINCIAL and DISTRICT ROADS of each kind in each DISTRICT of BENGAL.

Civil Divisions of Commissioners.	Districts.	Number of Miles of Provincial Roads.		Total.	Number of Miles of District Roads.				Total.	Grand Total.	Remarks.
		Metalled.	Unmetalled.		Metalled.	Bridged, but unmetalled.	Not bridged and unmetalled.	All other Roads.			
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Burdwan -	Calcutta - -	24	—	24	—	—	—	—	—	24	(*a*) Mileage not known. (*b*) Number and mileage not known.
	Burdwan - -	123	4	127	98	227	220	10 roads (*a*), besides village roads (*b*).	545	672	
	Bankoora - -	60	—	60	209	—	—	69, besides 2 roads (*a*).	278	338	
	Beerbhoom -	—	—	—	189	149	67	Village roads (*b*)	405	405	
	Midinapore -	111	—	111	150	365	47	Ditto (*b*) -	562	673	
	Hooghly and Howrah -	34	—	34	128	232	31	84, besides 5 roads (*a*) and union town and village roads (*b*).	475	509	

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BENGAL.

Ir. Toynbee.

STATEMENT showing the NUMBER of MILES of PROVINCIAL and DISTRICT ROADS of each kind in each DISTRICT of BENGAL—*continued.*

Civil Divisions of Commissioners.	Districts.	Number of Miles of Provincial Roads.			Number of Miles of District Roads.						Remarks.
		Metalled.	Unmetalled.	Total.	Metalled.	Bridged, but unmetalled.	Not bridged and unmetalled.	All other roads.	Total.	Grand Total.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12
Presidency -	24 Pergunnahs -	91	—	91	196	157	86	Village roads (*b*)	439	530	(*a*) Mileage not known. (*b*) Number and mileage not known.
	Nuddea - -	12	15	27	136	583	171	102, besides village roads (*b*)	992	1,019	
	Jessore - -	14	—	14	70	186	178	235	669	683	
	Moorshedabad -	—	—	—	27	213	389	90, besides village roads (*b*)	719	719	
Rajshahye -	Dinagepore -	—	—	—	—	248	—	—	248	248	
	Rajshahye -	—	—	—	5	219	—	71	295	295	
	Rungpore -	—	—	—	—	—	1,133	—	1,133	1,133	
	Bogra - -	—	—	—	—	129	117	78	324	324	
	Pubna - -	—	—	—	6	70	106	93, besides 9 roads (*a*).	275	275	
Cooch Behar -	Darjeeling -	55	138	193	13	130	—	8 roads (*a*)	143	336	
	Julpigoree -	—	—	—	—	202	193	—	395	395	
Dacca - -	Dacca - -	—	—	—	17	35	15	150	217	217	
	Furreedpore -	—	—	—	—	107	120	44	271	271	
	Backergunge -	—	—	—	—	85	—	—	85	85	
	Mymensingh -	—	—	—	54	186	256	Village roads (*b*)	496	496	
	Tipperah - -	—	52	52	—	112	94	308, besides village roads (*b*).	514	566	
Chittagong -	Chittagong -	—	46	46	—	127	101	8	236	282	
	Noakholly -	—	24	24	—	193	96	35	324	348	
	Hill tracts of Chittagong -	—	—	—	—	12	10	180	202	202	
Patna - -	Patna - -	36	—	36	36	102	67	273	478	514	
	Gya - -	124	27	151	97	71	402	135	705	856	
	Shahabad -	54	—	54	6	441	459	36	942	996	
	Mozufferpore -	—	—	—	—	543	—	104	647	647	
	Sarun - -	—	—	—	185	275	129	19 roads (*a*) -	589	589	
	Chumparun -	—	—	—	—	665	212	6	883	883	
Bhagulpore -	Monghyr - -	—	—	—	38	131	76	45	290	290	
	Bhagulpore -	—	—	—	45	218	162	19 roads (*a*), besides village roads (*b*).	425	425	
	Purneah - -	100	—	100	—	507	397	336	1,240	1,340	
	Malda - -	—	—	—	—	137	45	178	360	360	
	Sonthal Pergunnahs - -	—	—	—	184	161	78	10	433	433	
Orissa - -	Cuttack - -	60	260	320	43	149	109	61 besides village roads (*b*).	362	682	
	Pooree - -	114	—	114	—	69	14	Village roads (*b*)	83¾	197	
	Balasore - -	96	—	96	32	196	42	Ditto	270¼	366	
Chota Nagpore	Hazareebagh -	171	27	198	30	70	124	16	240	438	
	Lohardugga -	—	65	65	—	—	585	352, besides station and village roads (*b*).	937	1,002	
	Singbhoom -	—	—	—	—	—	—	544	544	544	
	Manbhoom -	112	26	138	—	528	—	—	528	666	
	Total - -	1,391	684	2,075	1,994	8,230	6,331		20,198	22,273	

CENTRAL ROVINCES.

r. Nicholls.

CENTRAL PROVINCES.

In the following districts the ordinary means of conveyance is by wheeled carriage; and there is a sufficient number of carts for all ordinary wants:—

Nagpur.
Wardha.
Bhandara.
Seoni.
Chhindwara.*
Nimar.
Hoshangabad.
Narsinghpur.
Saugor.

In Betul, Damoh, and Jubbulpore there appears to be a considerable deficiency, but in many parts of Damoh and Betul, perhaps also in Jubbulpore, carts cannot get about the country.

In Mandla and the uplands of Balaghat, carts are almost unknown. In the low lands of Balaghat, in the Wainganga valley, the country is very well supplied with carts.

Chanda shows a very great number of carts, but it is believed that these are mostly in the country on the west of the Wainganga. The east of the district is very wild, and the roads were such that the length of a journey would, not long ago, be described by the number of spare axles which would be sent with a cart to provide for breakages.

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* Aided by the carts of other districts and pack-bullocks.

But carts for driving purposes and for the carriage of goods are extensively made, as may be gathered from the fact that the value of those sold at the Chanda fairs during 1865-66 amounted to Rs. 3,38,700. During the year 1877-78, for some weeks considerably over 36,000 carts paid toll every week on the eastern road in the Bhandara district. A considerable portion of these belonged to Nagpur and Kamptee, and still more to Chhattisgarh. But the wonderful activity in cart making in the Bhandara district, where last year it was very difficult to get a carpenter to look at any other sort of work, seems to prove that, even aided by Nagpur and Bhandara, there are not sufficient carts in Chhattisgarh to meet the requirements of its ordinary trade, and apparently the carts which belong to the districts are almost confined to the west of the district.

The trade from Chhattisgarh towards the south, the eastern coast, with Ranchi and Mirzapur and Jubbulpore, is carried on by pack-bullocks.

The east of Raipur and Bilaspur are similar to Sambalpur, for which the deputy commissioner has given me the following account:

> "Mr. Russell, who has long been Settlement Officer here, writes 'that every village possesses 10 or 12 small carts with wooden axles and roughly made block wheels, not always quite round.' A smaller estimate of six to each village in the feudatory states gives the following numbers for the whole district:—
>
> Khalsa and non-feudatory zemindaries for 1,710 villages - - - 17,100
> Feudatories 4,597 villages - - - 27,582
>
> 44,682
>
> "Out of this large number there are perhaps not 50 which are used for exporting and importing goods. They are kept almost exclusively for agricultural purposes. The reason why they are used only to a limited extent is that the carts are very small and fragile,—the bullocks diminutive, and ill fed, and consequently weak. The average load of a cart is six maunds, and the length of journey per diem about eight or nine miles. The capabilities of the carts I have myself tested; for during the past marching season I employed some, and found that it took two to carry a single pole tent weighing 13½ maunds. As long as the marches did not exceed eight or nine miles they did fairly well, though they took longer in getting over the journey than buffaloes; but on my having to do 14 to 16 miles a day the bullocks on the second day broke down completely, and the only way in which I could prosecute the journey was by pressing fresh ones in the villages on the road. Taking every thing into consideration, I am of opinion that the wheeled carriage of this district is not sufficient for its ordinary wants, because it is not capable of being used with profit for carrying the export and import trade, and this opinion is fully borne out by the fact that ganjam and cuttack carts, together with pack-bullocks, are exclusively used for this purpose when goods are taken by road. Should a famine occur such as would necessitate the importing from long distances of considerable quantities of food grain, it is my opinion that the wheeled carriage would be only useful in distributing grain brought to depôts by other means of conveyance, and that it would be useless to expect the carts to be available for the work of importation. The cost of carriage per ton per mile may be put down at 5½ annas."

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Central Provinces.

Mr. Nicholls.

Whatever may be our shortcomings in the way of carriage, what we have has been sufficient to block up all the railway stations in the provinces, the railways being quite unable in a time of pressure to remove it fast enough.

Question.—What is the ordinary cost per mile of conveying one ton of merchandise either by wheeled or by pack carriage?

Answer.—It was recently calculated that the cost on the Great Eastern road of the conveyance by carts was 2¼ annas a ton per mile. Where grazing is abundant and time no object, it is believed that the rates for conveyance by pack-bullocks would be generally lower. There are also parts where only pack bullocks or buffaloes can be used.

The following rates have been supplied to me:—

	By carts.	By pack-bullock.
Sambalpur - -	5½ annas	—
Nimar - -		
Chhindwara - -	4½ "	—
Narsinghpur - -	4 "	4½*
Saugor - -	3¼ "	—
Wardha - -	3 "	—
Bhandara - -	2¾ "	2¼
Balaghat - -		
Seoni - -		
Raipur - -		
Nagpur - -	2 "	—

The difference of rates in the Jubbulpore district is very great. I give the reply furnished by the deputy commissioner for each tahsîl:—

> *Tahsîl Jubbulpore.*—"The hire per maund per mile is 3 pie, hence the cost of conveying one ton of merchandise comes to 7 annas, either by wheeled or by pack carriage. Ordinarily a pack bullock or pony can carry 2 maunds, and a cart with 2 bullocks 8 maunds. The hire of a cart is 15 annas per diem, and that of a bullock, including the driver, is 6 annas a day; the cart or bullock can travel 12 miles a day.
>
> *Tahsîl Sihora.*—"One ton of merchandise can be conveyed at a cost of 5 annas and 6 pie by pack-bullocks, but would cost 4 annas a mile if conveyed by wheeled carriage. A pack-bullock can carry 2 maunds and 20 seers, and a cart drawn by 2 bullocks will hold 15 maunds. The daily hire for a cart is Rs. 1-8-0, and for a bullock 6 annas; carts and pack-bullocks can travel 15 miles a day.

Tahsîl Murwara.—"The cost of conveying one ton of merchandise per mile is 2 annas 6 pie by cart, and 3 annas 6 pie by pack-bullocks; a cart can convey 14 maunds, and can travel 12 miles per diem; a pack-bullock can carry 2 maunds, and travel 12 miles. The hire of the former is 15 annas a day, and that of the latter is 3 annas."

Major May.

Means of communication.—The means of communication in these provinces are, on the whole, at present unsatisfactory, but yet the province has many general advantages.

Connection of centres of trade.—The centres of the grain trade may be said to be, (1) Murwara, (2) Jubbulpore, (3) Saugor, (4) Gadarwara, (5) Harda, (6) Khandwa, (7) Mandla, (8) Hinganghat, (9) Nagpur, (10) Kamptee, (11) Toomsar, (12) Dongergarh, (13) Raipur. Of these, 1, 2, 4, 5, 6, 8, and 9 have railway communication, 10, 11, 12, and 13 will be connected with a railway in about two or three years,

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* Buffaloes are mostly used instead of pack-bullocks in the Narsinghpur district.

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CENTRAL 'ROVINCES.

ajor Mayne.

and 3 and 7 are connected with a railway by bridged and metalled roads.

Condition of roads.—The bridged and metalled roads are maintained in a condition to be open for traffic throughout the year. Others are difficult to traverse during the rains, but generally for $7\frac{1}{2}$ months in the year, or from the end of October to the middle of June, are available for traffic without much difficulty. Portions of the Great Indian Peninsular with East Indian and Holkar State Railways traverse the province, besides the Wardha Valley State Railway, making a total of about 530 miles of railway within the limits of the province. Of ordinary roads, this department now maintains about 900 miles of metalled and bridged roads, 120 raised, bridged, and unmetalled, and 250 neither raised nor bridged. Besides these, numerous district roads exist, some of which are raised and bridged. Water communication exists in the Upper Godavari district by means of the river Godavari, and I believe it also exists in Sambalpur district by the river Mahanadi.

In the black cotton soil districts the country may be said to be closed for wheel traffic during the monsoon, or for $4\frac{1}{2}$ months in the year; and in cases of distress from famine, the difficulties and cost of carriage of grain over such tracts would be enormous.

Ordinary means of conveyance.—Wherever roads are constructed and maintained, wheeled carriage at once takes the place of the pack-animals. At present, a very large portion of the traffic is carried by means of the latter. Between the two, *i.e.*, the wheeled carriage and pack-animals, there is an enormous quantity of carriage available.

Cost of carriage per mile per ton.—The cost of carriage by cart or pack-animals has risen of late years. The demand has been greater on account of the large development of the grain trade, and expenses are heavier. On the metalled roads, carts will carry about $\frac{3}{4}$-ton, and travel from 10 to 15 miles a day. In the last trading season, the hire of a cart was Rs. 22-8-0 per mensem or 12 annas a day. This would bring up the cost (at 12 miles a day) to about 16 pies per ton per mile.

Pack-bullocks carry about $3\frac{1}{4}$ maunds or $\frac{1}{8}$ of a ton from 8 to 10 miles a day, over mere tracks. One man takes care of about 20 cattle. What their actual cost for feeding is I cannot say, but I understand that in some places now the malguzars (more alive to their own interests than formerly) charge grazing fees on cattle feeding on their estates. The cost of carriage, whether by wheeled conveyance or animals, is, I imagine, much the same, as far as expenses go, but less capital is required for carts, as in these two bullocks will draw $\frac{3}{4}$-ton, whereas that quantity would require six pack-bullocks.

BERAR.

Ir. Dunlop.

BERAR.

A few years ago a scheme was sanctioned for supplying the province with a complete net-work of second-class roads, and this is now gradually being worked out.

The Amraoti and Akola districts are already well furnished with roads. In Basim, Wun, and Buldana some important lines are under construction.

The roads are not all completely bridged, but they are generally sufficiently so for the traffic that is on them. The rivers that are unbridged seldom remain in flood for any length of time, and during the rains a delay of a few hours is all the inconvenience that cartmen occasionally experience. In addition to second-class roads, third-class roads, viz., fair-weather tracks, are kept in repair.

The supply of carts is sufficient for the ordinary requirements of the province, but there is no surplus supply.

The deputy commissioner of Amraoti could not recently find any one to contract for the supply of 150 carts for carriage to a regiment about to march from Ellichpur to Aurungabad. Traders, however, find no difficulty in getting their general requirements in this respect supplied. Many of them make carting contracts for the season.

A great improvement has taken place in late years in the style of cart in use, the old Berar cart, capable of carrying only 10 maunds, being gradually replaced by the Madras bandy, which carries 15 maunds.

In the Ellichpur district the cost of carrying one ton is said by the deputy commissioner to be three annas per mile, each cart carrying half a ton. In the Wun district it is said to be four annas a mile, and in the Amraoti district from four to six annas. In the Akola district it is six annas on the average, but the trade rate varies considerably at times.

BOMBAY.

Colonel 'nkin Jones.

BOMBAY.

The province is well supplied with metalled and moorum roads. In the central division the roads named are bridged and metalled:—

Poona viâ Sholapur as far as Tandulwaree, Nizam's frontier.

Poona viâ Ahmednagar to Toka.

Poona to the foot of Bhore ghaut towards Bombay.

Poona viâ Satara to the Kolhapur State, near the Warna river.

Barsee Road station viâ Barsi to Yedsi.

Kurrar to Chiploon by the Koombharlee ghaut.

Soorool on the Poona and Satara road, viâ Waee to Mahableshwur.

Nearly all the rivers on these roads are bridged, except the Warna, on the Satara and Kolhapur road, where a masonry bridge is being built; the Bhima river at Koregaum, on the Poona and Ahmednagar road; the Bhimá and Seená rivers, on the Poona and Sholapur road. Flying bridges are, however, provided for these river crossings.

In the northern division the old Bombay and Agra road extends from the foot of the Thull ghaut to the frontier of Khandesh. There is a bridged and metalled road from the Munmar railway station to Dhoolia, which, with the exception of the Girna river, is bridged and drained throughout.

As a general rule, all the rivers and nullas south of the Tapti are passable for traffic during the rains, except the Girna. Carts may be detained by floods, but the water soon runs off. The Girna is also passable at ordinary times during the rains, but for a fortnight or more can only be crossed by boats. From the beginning of the rains to the end of November the Tapti can only be crossed by boats.

Besides the above-mentioned roads there are many moorum roads more or less bridged and drained, besides fair-weather roads connecting the taluka stations of the different collectorates.

The roads are in good working order. The metalled roads are open throughout the year, and so also are the moorum roads, the large rivers still unbridged being crossed by flying bridges or ferry-boats.

The ordinary means of conveyance are chiefly wheeled carriages, but in parts of the Satara and Kandesh collectorates bordering on the Ghauts pack-bullocks are also employed.

There is a sufficient number of carts and bullocks.

Conveyance per ton by wheeled carriage averages from two to five annas per mile, and by pack-bullock something more.

No new lines suggested.

From the main artery of communication from Poona south through Satara, Kolhapur, Belgaum, Dharwar, Hooblee, and Hurryhur, six first-class bridged, drained, and metalled roads communicate with ports on the western coast.

Of these six roads two between Poona and Kurrar have no connection with the southern division. The third is situated about 30 miles north of the Warna river, the northern boundary of the southern division. It connects the mail road with the busy port of Chiploon, and though outside the southern division a large portion of the trade of the division is conveyed over this route.

The next first-class road connects Belgaum, 118 miles south of Kurrar, with the port of Vingorla. The remaining two first-class roads connect the town of Hooblee, 12 miles south of Dharwar, with the ports of Karwar and Coompta.

In addition to these first-class roads there are others, fair-weather roads only, not being completely bridged and drained or metalled, which connect the Deccan with the Konkan. These roads cross the Sahyadri range at the Phonda and Tini ghats. The Phonda ghat lies between Kolhapur and Belgaum, and is connected with the Poona mail road at Kolhaphur and due east at Neepani. Of these two connecting lines that from Kolhapur to Phonda is a fair-weather road partially bridged and drained. The other road is a secondary fair-weather road, unbridged and undrained. The Phonda ghat is a good mountain road, metalled and completely drained, and from its foot four unmetalled roads communicate with the coast at Rajapur, Wagotun, Deoghur, and Malwan. That to Deoghur directly west is the only road bridged and drained. But this line is little used, the trade, as of old, going to Rajapur, the chief town in the Ratnagiri district, and to Malwan.

The Tini ghat is a pass on the mountains due west of Dharwar. This route passes into the Portuguese territory of Goa. The road is partially bridged and drained, and is unmetalled.

Another road of communication between the Deccan and the coast by the Amba ghat, which lies west of Kolhapur, is now under construction. The ghat road will be completed in 1879–80, and likewise the connecting roads to Kolhapur and Ratnagiri. This line will be completely bridged and drained, and will be open at all seasons to wheeled-carriage traffic.

The centres of trade, so far as the mail road connecting Kolhapur, Belgaum, and Dharwar with Poona, are thus in communication with ports on the coast, and cart traffic is not suspended during the south-west monsoon by the (1) Chiploon and Karar; (2) Vingorla and Belgaum; (3) Karwar and Dharwar; (4) Coompta and Hubli roads by reason of the inefficiency of the roads themselves. All these roads are open to traffic at all seasons of the year; but as the ports are virtually closed during the south-west monsoon, there is little cart traffic between July and September. Karwar is a small port, and gives little shelter during the south-west monsoon; but there is very little trade there at that season, as native craft do not ply, and ships, excepting those of the British India line, on their way to and from Calcutta, are very shy of venturing near the western ports on a lee shore.

When the Amba ghât road is completed, and a connection is made with Meria Bay at Ratnagiri, a small amount of shelter may be obtained at that port during the south-west monsoon. Practically the western coast is closed at this season; and if it had safe harbours, trade would be very slack on account of the very heavy rainfall in the Konkan and on the Sahyadri range. Twelve feet of rain in the Konkan, and 16 to 20 feet on the mountain, between the 1st of June and 1st of November, is an ordinary rainfall in those parts, and few articles of trade could encounter such wet weather and dampness without deterioration.

During the famine of 1877 cart traffic traversed the roads mentioned the whole of the wet season. The famine was the cause of immense quantities of grain being shipped during the open season to Compta, Karwar, Vingorla, and Chiploon, which were not conveyed up country before the wet season set in. The coast traders accordingly had their grain carted during the wet season; and as vast numbers of the cattle of the Deccan had died, this traffic was continued with human draught to the bullock-carts. The carts drawn by men were very destructive to the roads, for, as in the ordinary way seven bags of grain make the load for a pair of bullocks (about half a ton), the traders paid the cartmen by the trip for the loads; thus in their eagerness for a good return for their labour, the cartmen used to carry double loads.

Kaira.—Mr. Porteous says: Nariad, Dakor, and Wassad, three of the principal centres of trade, are all on the railway; and Kapadwanj, another trading centre, is connected by a good road with Dakor.

The country to the west of the B. B. and C. I. Railway is not, in my opinion, sufficiently provided with roads. The very rich taluk of Borsad has only one road, that connecting it with Wassad railway station.

Those roads which do exist are open throughout the year, and they are sufficient for the traffic which at present uses them.

In the open season there are numberless cart tracks; every village almost has its cart track to neighbouring villages or to the nearest roads, but these tracks are closed to all wheeled traffic in the monsoon. It is of importance to recollect this in connection with the condition of the country to the west of the railway. There is a very dense population in Borsad, and for at least three months in the year the whole of it, except the considerable fraction inhabiting the taluka town itself, and three or four villages on the road thence to Wassad, can import or export nothing except on pack-bullocks. I saw a great deal of the taluk in May and June of this hot weather; and I am convinced that if famine ever threatens this district, one of the first things to think of will be the best means of making the Borsad taluk less inaccessible in the monsoon. Unfortunately the taluk is so interlaced with foreign territory (Baroda and Cambay) that unless these states co-operate, Government would have to provide Baroda and Cambay ryots with roads by the very act of providing them for our own people.

Thana.—The three lines of railroad and the Agra road, and the road from Poona to Panwell, afford the chief means of internal communication. There are but few other roads in the district, and they may be said to be confined to the Salsette and Panwell talukas; short roads, constructed from local funds. The centres of trade are Bhiwandi and Kalyan. Both are easy of communication with Bombay and Thana by water, and a good metalled road runs between Bhiwandi and Thana, and Bhiwandi and Kalyan. The former is the Agra road, which is cut in two by the unbridged Thana creek. The latter runs to the Kalyan creek, on the farther bank of which the town of Kalyan is built. The creek is unbridged. Road communication along the coast is quite wanting, and in the interior it is confined to rough cart tracks, constantly intersected by streams and rivers. A moorum road (unbridged) is now being made between Kalyan and the Malsej ghat, leading into the Poona district. Between the principal stations on the B. B. and C. I. Railway and the larger villages on the coast there are generally railway feeders constructed from local funds, but the whole interior part of the district is destitute of roads, except common cart tracks, which are made passable for the fair season, where serious difficulties are found, by such expenditure annually as the local funds can afford. The ordinary charge to traders for carriage by cart and by pack-bullocks

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BOMBAY.

Major-General Wilkins.

is as follows: from 12 annas to 1 rupee per cart per day; from 4 to 8 annas per day per pack-bullock.

Khandesh.—Khandesh, as compared with other provinces, is certainly well off as regards means of communication, The G. I. P. Railway passes through the district from south-west to north-east for about 135 miles.

Bridged and metalled roads have been constructed from many of the railway stations to the nearest centres of trade. A list of metalled roads is appended:—

Bombay-Agra road (74 miles), passing through the Dhulia, Virdel, and Shirpur talukas.

Dhulia-Chalisgaon road (34 miles), leading to the first railway station in Khandesh, viz. Chalisgaon.

Dhulia-Surat road (about 24 miles finished, the rest in fair order), passing through the Dhulia and Pimpalner taluks.

Dhulia-Erandol and Mhasawad railway station road (45 miles), passing through the Dhulia, Amalner, and Erandol taluks.

Jalgaon-Neri road (20 miles), passing through the Jamner and Nasirabad talukas.

Songir-Nandurbar road (24 miles completed), passing through the Dhulia, Virdel, and Nandurbar taluks.

Bhadgaon-Pachora road (9 miles), connecting the town of Bhadgaon with the Pachora railway station.

Sauda-Gata road (3 miles), railway feeder.

Erandol-Dharangaon road (6 miles), connecting the towns of Erandol and Dharangaon.

Parola-Kajgaon road (24 miles), leading to the railway station of Kajgaon.

Many important centres of trade, though not *all*, are connected by means of the above roads. Annually, some new lines of communication are taken in hand as funds permit, and it is hoped that under the new five years' budget system recently introduced by Government all important communications will eventually be provided for.

The roads are sufficient; in fact, in the fair weather, traffic rather avoids the made roads, in order to escape paying tolls.

Ahmednagar.—Considering the size and importance of the district, it must be said that road communication is very defective, but a decided improvement has taken place within the last two years. There is only one bridged and metalled road, namely, that to Poona, which is by no means of the highest commercial importance. The roads connecting the principal towns and marts with Nagar itself are good enough for fair weather, but they are mostly impassable in the rains.

Kaladgi.—The means of communication in the district are about as bad as they can be. There are two main roads leading into the district—one from Sholapur to Hubli in the Dharwar district, going right through the district from north to south; the other from the coast and Belgaum to Bagulkot, the chief town in the district, and then extending on to Hungund, another town. This last road intersects the district south of the Krishna, and runs from west to east. On these two roads the principal export and import traffic goes on. They are provincial roads; but only so in name. The first (the most important one, as leading to the railway) has not a bridge, drain, or culvert on its whole length; the last has a few drains and culverts. Neither of them is much better than country cart tracks, and as soon as the heavy monsoon rains set in they become absolutely impassable for wheeled traffic, so that the district becomes quite isolated. There are a fair number of local fund roads in the district, many of which are in better order than the provincial ones; but they do not lead out of the district, which is the great want. As far as I can judge, literally nothing has been spent out of provincial funds in this district in comparison to what has been spent in other places, whilst as a paying district it is one of the best.

There is not much traffic by pack-bullocks—individual petty traders keep a few, but there are no large herds kept by wanjaras and lamanis, as in some parts of India. Carts are the chief means of conveyance. There are sufficient of them. Cost per ton per mile $2\frac{2}{3}$ annas.

SINDH.

Col. Haig.

SINDH.

The province is well supplied with roads, which are for the most part bridged, but none are metalled. In North Sindh a rude description of cart is employed, but throughout the province generally the camel is the means of conveyance. Thus unmetalled roads suffice for existing needs of traffic, and they remain open throughout the year, except when floods occur, in which case metalled roads would be equally useless. *An increased employment of carts is greatly to be desired for the province, but a better kind of vehicle than that in use in North Sindh is also a desideratum.* The ordinary cost of conveyance of goods is—

By cart—4 annas per ton per mile.

By camel—2 annas 8 pie per ton per mile.

MADRAS.

The Board of Revenue.

MADRAS.

It may be said generally that the road communications of the presidency are satisfactory. Bridged and metalled roads do as a rule connect all the important centres of trade, and are in good working order and sufficient for the traffic on them, but it must be understood that the Board do not mean to say that there is not room for improvement by the addition of more bridges and more thorough metalling. There are also many fairly important trading localities which have only gravelled roads, and for which metalled roads would be highly desirable, as the facilities afforded by the gravelled roads would be severely strained by any unusual accession of traffic. As a rule, however, there is but little to complain of with regard to the roads in the Madras presidency. They are generally open to traffic all the year through, but in places where the bridging has not been completed, or where a bridge has been carried away and not yet replaced, there would probably be an interruption to traffic during heavy floods, but in the case of an emergency arrangements would very soon be extemporised for overcoming a difficulty of this kind occurring between any important centres of trade. When roads pass over black cotton soil those that are not metalled are often impassable in very wet weather, but it is only in Bellary that the facilities for traffic are affected in this way to any great extent, and the important centres are reported to be connected by metalled roads. From Canara, where the rainfall is always over 120 inches, it is reported by the collector that the roads are closed to wheeled traffic during the rainy season for want of bridges over rivers or streams by which they are crossed, but with reference to this it must be borne in mind that, even if the roads were bridged throughout, there never would be any active traffic during the height of the south-west monsoon; and the district engineer, arguing from practical experience during the last monsoon, is of opinion that it can hardly be said that the roads are altogether closed

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in the rains. It may be added that such a thing as a famine has never been known in Canara.

With reference to the Kistna district only is it reported that the roads are in a generally unsatisfactory state. The collector writes: "The means "of communication by road are very indifferent. "Bridged and metalled roads are the exception; "existing roads are not in good working order, nor "are they sufficient for the traffic. The non-metalled "roads are virtually closed to wheeled traffic during "the rains." As a set-off against this, it is to be borne in mind that there is canal or river communication between the chief centres of trade; that the rainy season, during which the roads are virtually closed, is of very limited duration; that the ordinary cost of carriage per ton by road is by no means high, viz., annas 3–6; that it has not been considered necessary to raise the local taxation for roads so high as in most other districts of the presidency, though the people could well afford it, and that the collector answers question 21 in the negative.

Except in the hill tracts of Ganjam and Vizagapatam and parts of the districts of Malabar and Canara skirting the western ghâts, wheeled carriage is the rule throughout the presidency, but wherever there are hills there are pack-bullocks supplementing the wheeled traffic. Where wheeled traffic is the rule, sufficient carts are forthcoming for all the ordinary wants of the district.

The following table shows the number of miles of road in each district, and the average ordinary cost per mile of conveying one ton of merchandise. It will be observed that the rates are singularly high in Malabar, and singularly low in Salem. In Malabar, where money is abundant, everything is dear, but with regard to Salem the only explanation which occurs to the Board is that there is a mistake in the collector's report, which states that a cart carries "1⅝ of a ton at an average rate of 1½ annas per mile." A cart-load is usually taken to be about half a ton.

District.	Area.	Miles of Road.	Cost of conveying one Ton.	
			Wheeled.	Pack.
	Sq. Miles.	Miles.	Rs. A. P.	Rs A. P.
Ganjam (excluding the hill tracts)	2,598	820	0 2 4	—
Vizagapatam do.	5,303	632	0 2 0	—
Godavâri	6,224	702	0 4 0	—
Kistna	8,036	774	0 3 6	0 3
Nellore	8,462	740	0 3 2	—
Cuddapah	8,367	879	0 4 0	0 8 0
Bellary	11,007	1,452	0 2 10	—
Kurnool	7,358	441	0 3 0	—
Chingleput	2,753	706	0 3 0	—
North Arcot	7,139	1,160	0 3 0	—
South Arcot	4,873	1,169	0 3 6	—
Tanjore	3,654	1,390	0 3 6	—
Trichinopoly	3,515	533	0 4 6	—
Madura	9,502	993	0 3 2	—
Tinnevelly	5,176	828	0 4 6	—
Coimbatore	7,432	1,364	0 2 4	—
Nilgiris	749	240	0 8 6	—
Salem	7,483	1,445	0 0 11	—
Canara	3,902	806	0 5 0	0 8 0
Malabar	6,002	1,617	0 7 5	1 4 1
Total	119,535	18,691	—	—

The areas given above exclude the hill tracts of the districts of Ganjam and Vizagapatam. With reference to the latter, the collector writes: "The "rugged tracks used by the trains of pack-bullocks "are being smoothed, causeways are being made "across morasses, and wooden bridges over some of "the minor streams. The country produces all that "is needed for its sparse population." The same may be said of the other hill tracts.

MYSORE.

MYSORE.

Captain Bowen, R.E.

The only means of intercommunication in the province are by roads—the Madras Railway traversing only the few taluks due east of Bangalore.

All the important centres of trade are connected by good bridged and metalled roads. The majority, however, of the cross or local roads are unmetalled, and but partially bridged. Nevertheless, they are practically closed to traffic but for very short periods during heavy rains. The local roads intersected by the Cauvery, Toonga, and Budra rivers are exceptions to this statement, these rivers during the monsoon being often impassable for days together. In the absence of bridges the establishment of a better description of ferry than that now in use is desirable at some of these points of intersection.

Along the northern, eastern, and southern frontiers the roads connecting the Mysore province with Her Majesty's territories are sufficient to meet all ordinary requirements. The outlet to the Wynad at the south-eastern corner of the Mysore district is, however, impassable during the rains; and as the coffee plantations of the Wynad draw the whole of their labour from Mysore, as well as the grain to feed that labour, the improvement of this, the Mysore-Manantoddy road, is of importance. At the same time it must be added that the Wynad has good communication with the Gundulpett taluk by an excellent bridged road recently completed. Communication with the Canara district on the west is impeded to a serious extent during the monsoon by the imperfect condition of the Manjarabad, Bhoond, and Agumbi ghats, the first two of which are now being gradually improved. The necessity for perfecting, as far as possible, these inlets from the west and for improving the communication between the heads of the ghats was well illustrated during the July rains of 1877, when the price of grain at Suklespur and Mudgherri was greatly enhanced by the failure on the part of some traders to get their grain-carts up the ghats. The ascent of the Bhoond ghat or Munjarebad ghat is seldom or never attempted during the heavy bursts of the monsoon, but on this occasion the extraordinary high prices prevailing apparently induced a few enterprising merchants to make the attempt. At this time in South Canara rice was selling at 12* seers the rupee; at Suklespur, Wastara, Aldur, Mudgherri, it averaged 3½ seers the rupee. The mere fact of bridging and improving the road connecting Chikmaglur with the head of the Bhoond ghat has effected a very sensible reduction in the cost of conveying coffee from the Kadur plantation to the coast. To make perfect the roads over and along the ghats would sensibly affect the cost of food in the west in time of famine, and the importance of this object is materially increased by the large numbers of coolies who now gain their livelihood in the rapidly-developing coffee plantations of Koppa, Kadur, and Manjarabad.

The extensive triangular tract of country bounded by the Tarrikere-Chittledrug, Shemoga-Hiriyur, and Chittledrug-Harihar roads is badly off in the matter of roads, the line traversing it from Benikpur viâ Chennagiri, Dumi, and Holakere being very imperfect. It may, however, be remarked that this part of the country is but sparsely populated.

The ordinary means of conveyance in the country is by bullock-carts, of which there is a sufficient number for its wants. A good deal of the grain coming up

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* I am doubtful about this, and cannot find my notes on the matter.

MYSORE.

Captain Bowen, R.E.

the western ghats and much of that passing from village to village in the Mulnaad, is carried by pack-bullocks, a small fraction by donkeys.

The ordinary cost of carriage is in the Public Works Department 1½ annas per mile per 1,000 lb.; but during the year 1877 the rate was raised to 2 annas per mile, which was about the rate then prevailing for carts employed in the grain traffic. In ordinary years, however, the cost of conveyance of grain is, I should say, not more than 1 anna per mile per 1,000 lb.

RAJPUTANA.

Capt. Barr.

Col. Benyon.

Dr. Moore.

RAJPUTANA.

Jodhpúr, Jesalmir, Captain Barr.—There is only one metalled road in the province; it is 100 miles in length, and passes through the south-eastern portion of Marwar, from the rail at Beawar, to the boundary of Marwar and Sirohi, about 40 miles from the foot of Mount Aboo. The country being generally flat and easy to traverse, roads connecting villages are plentiful and easy for carts, camels, and bullocks. In seasons of scarcity of food grains, Brinjarra bullocks carry a great deal. In ordinary years, carts are generally used in the more cultivated districts, while camels and bullocks are employed more generally in the northern and north-eastern parts, where the country is chiefly a sandy desert. The ordinary rates of carriage are: wheeled carriage 5 annas per ton per mile in dry weather, 6½ annas per ton per mile in hot weather; packed carriage, 8 annas per ton per mile.

Jaipúr, Colonel Benyon.—There are 265 miles of good metalled road in the state. One parallel to the Rajpootana State Railway (constructed previous to the railway) 127 miles long, and two good metalled roads perpendicular to the line of railway as feeders to it —one from Mandoar to the Kerrowli border, one from Jeypore to Tonk, the adjoining state to the south.

When the famine in 1868 occurred in Rajpootana, the road mentioned above as parallel to the railway was of the greatest use in facilitating the transport of grain from Agra to Ajmere.

Dr. Moore.—Means of communication are very backward. The first-made road in the province was through the Burtpore state—a work initiated when the chief was a minor, and the administration in the hands of a British officer. This was about 15 years ago. Shortly afterwards, the Jeypore Maharajah was induced to continue this road through his territory, as far as the city of Jeypore, and this road was completed, excepting one or two bridges, some eight or nine years back. Then a road was made from Ajmere to Beaur, in British territory, and more recently from Jeypore to Ajmere, partly through Jeypore and partly through British districts. As usually happens, some good results even from epidemics and famines. The famine of 1868–69 painfully showed the great necessity of better means of communication and the works instituted under the guidance of Colonel Keatinge took the form of road making. The most important road made was through the Burr pass, which, although the central road of the province and the route from Bombay and Guzerat to the north-west, was nevertheless in exactly the same condition as it probably was a thousand years previously,—scarcely passable for a wheeled vehicle. Afterwards the road was carried on through Marwar and Serohi to the foot of Aboo. The continuation of this road viâ Deesa, Sidphoor, and Mysanna to Ahmedabad is still in a most disgraceful condition, being simply a track through the sand, not drivable over. Another famine road was from Ajmere, or rather Nusseerabad, to the military station of Deoli, and some attempt at a road was also made from Deoli to Tonk, and between Jeypore and Tonk. None of these roads are, however, fully bridged. There are one or two rivers on all of them, which, for a few days every year, always stop traffic.

CENTRAL INDIA.

Lt.-Col. Bannerman.

ir Shahamat Ali.

Lt.-Col. Martin.

CENTRAL INDIA.

Lieutenant-Colonel Bannerman, Bhopal.—A metalled and bridged road to G. I. P. Station at Etarsee. Carts are used in dry season, and at other times pack-bullocks.

Baghelkhand.—A large portion of Baghelkhand is full of jungles and hills, and is very backward in the way of internal communications. The several market places are connected by common country paths almost impassable during the rains. North of the Kaimurs there is the magnificent Deccan road, from Mirzapore to Jabalpur, which for 150 miles runs through this agency, and passes through Rewah and Maihar. (2) Branching from it is a road from Rewah to Allahabad viâ Sohagee pass. (3) The Sutna Bella road, bridged and metalled throughout, which leaves the Deccan road nine miles from Rewah, and strikes the railway at Sutna. (4) The imperial road from Sutna to Nowgong, in the heart of Bundelkhand, almost completely bridged and metalled, and runs through the states of Nagode and Sohawal.

These 1, 3, 4 are open all through the year, and the only bad part of 2 is in Rewah territory.

On these lines traffic is by carts, of which there is a limited number, on all other by pack-bullocks generally.

On the pucka roads the cost per mile for conveying one ton of merchandise is 3 annas 7 pies, or say 4 annas; in the wilder parts of the country, by pack-bullocks, 4½ annas."

Rutlam, Mir Shahamat Ali.—The means of communication are the common cart tracts, and not made roads, except the Mhow and Neemuch road, which alone is metalled and bridged. All other centres of trade are connected by cart tracks, which are only open for carts in the dry weather, and closed for wheeled traffic in the rains. The ordinary means of conveyance is mostly by wheeled carriage, and also by pack-bullocks, especially in the hilly tracts. There is a sufficient number of carts in the district for all its wants. The ordinary cost per mile of conveying one ton of merchandise, either by wheeled or by pack-bullock carriage, is 7 annas.

Western Malwa, Lieutenant-Colonel Martin.—The Holkar and Neemuch State Railways, completed to Rutlam and under construction to Neemuch, traverse almost the extreme west of the district from south to north. A branch connects Oojein with this line, and they bring the furthest corner of the district within less than 100 miles. A metalled road runs from Mhow to Neemuch, and the Agra and Bombay road, also metalled, traverses the district at the eastern extremity in a N.E. direction. A metalled road is under construction from Oojein to Agra, 43 miles in length. These are all the means of communication open or under construction, and capable of use throughout the year; and, as stated before, roads are the most useful works that can be undertaken.

CHAPTER I.—QUESTION 19.

To what extent are railways developed in your province? What districts are not traversed by them, and what distances have to be gone to reach the railways from the districts furthest from them? Are any districts so much isolated as to make it desirable to extend railways to them to facilitate the introduction of food in time of famine? Has the effect of the existing railways been to equalise prices and stimulate trade to any important extent? Give any facts that support this view.

PUNJAB.

Punjab.
Major Wace.

A railway traverses the submontane districts of the province, commencing with Gurgaon at its south-east end, and ending at Jhelum near its north-west end. This will shortly be completed to Rawalpindi, and perhaps to Attock, which stations are respectively 100 and 44 miles from the frontier city of Peshâwar. Another line, branching off from the first at Lahore, runs in a south-westerly direction to Mooltan, and thence to Karráchi down the Indus valley. The first 30 miles of railway in the province, that between Lahore and Amritsar, was opened in March 1862; the line from Lahore to Mooltan was opened in April 1865; by October 1870 the Lahore and Amritsar line was extended to Gházíabad, near Delhi, thus joining the terminus of the East Indian Railway, and placing the trade of the province for the first time in direct and unbroken railway communication with Calcutta and Bombay. The extension from Lahore to Jhelum was opened in 1876. The Indus Valley line, joining Mooltan with the Kotree and Kurrachee line in Sind, has only just been opened. The total railway mileage open in the Punjab now is :—

Name of Railway.	——	Miles.
Punjab Northern State Railway.	Lahore to Jhelum - -	103
Sind, Punjab, and Delhi Railway - - -	„ to the river Jumna, en route to Delhi.*	224
	„ to Mooltan and Sher Shah.	218
Indus Valley State Railway.	Mooltan to the river Sutlej, en route to Karachee.†	57
Rájputána State Railway	Delhi to Riwári, en route to Ajmir.‡	55
	Total - - -	657

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* The remaining line to Delhi, 124 miles, runs through the Sahâranpur, Muzaffarnaggar, and Meerut districts of the North-Western provinces.

† The remaining portion of the line is now open to Kotri, and thence by the Sind Puujab and Delhi Company's line to Karrachi.

‡ This line will, when completed, connect Delhi with Baroda and Bombay.

Lines under Construction.—The only considerable line under construction is the extension of the Punjab Northern State Railway from Jhelum viâ Rawalpindi to the Indus river at Attock. The distance is about 120 miles. The portion to Rawalpindi will be opened, perhaps, 12 months hence; the probable date of completion of the remaining 56 miles cannot yet be stated. It is also in contemplation to construct a light narrow-gauge line from Lálla Músa, near Gujrát, to Miáni, on the Jhelum, a distance of about 50 miles. Miáni is opposite the salt mines of Pind Dádan Khan; and the salt traffic on the line would of itself yield a handsome return. The country which the line would pass over is perfectly flat, and, the material lately used on the narrow-gauge line between Lahore and Jhelum being utilised for this line, the cost of construction will be very small.

Districts not traversed by Railways.—Assuming that the line of railway which already extends from Delhi to Jhelum will shortly be completed to the Indus, of which there is practically no doubt, and that a district of which the major portion lies within 50 miles of a railway is for all practical purposes served by it, the only districts to which we need direct our attention are—

(1.) Gurdáspur and Kángra, lying north of the railway system;

(2.) The Hissar division line south of it; and

(3.) The Jhang district and Deraját division, which may be roughly described as the country south of the Salt Range and west of the Chenab.

To take each of these tracts in turn—

(1.) From the Amritsar station to Pathánkot at the northern end of the Gurdáspur district is 72 miles, and the road is metalled. From Jullundur to Kángra is a distance of 88 miles; the road is not metalled, but is otherwise an excellent one. It is not unlikely that a light railroad may be constructed joining Amritsar with Pathánkot; but the matter is not urgent.

(2.) From Delhi to Hissar is 104 miles, and from Delhi to Sirsa is 157 miles. Thence viâ Fázilka to Montgomery, on the Mooltan line, is 158 miles. The road from Delhi to Sirsa is partly metalled.

(3.) This tract may be considered as having Miánwáli and Bannu (Edwardes-abad) as the points most removed from the railway system, with Jhelum and Mooltan as the nearest convenient points on the railway. These several points are connected by excellent unmetalled roads; they are not bridged, but as the entire carriage of the country is camel carriage, and the rainfall very small, bridges are little needed. The distance by road from Miánwáli to Mooltan is 194 miles, and to Jhelum 115 miles. That from Bannu down the west bank of the Indus to Mithankot is 307 miles. Mithankot is on the Indus just below its confluence with the Chenab, and is some 25 miles from the Indus Valley Railway.

No districts are so much isolated as to make it desirable to extend railways to them to facilitate the introduction of food in time of famine. The only part of the province concerning which any discussion can arise is the tract numbered 3 above, the country west of the Chenab and south of the Salt Range. The population and irrigation in this tract are :—

District.	Population, Souls.	Per cent. of Area cultivated, which is—	
		Irrigated.	Sailab, *i.e.*, protected by River Floods.
Bannu - - - - - -	287,547	15	13
Dera Ismail Khan - -	394,846	32	35
Dera Ghâzi Khan - - -	308,840	57	10
Jhang - - - - - -	348,027	69	30
Total - - - -	1,339,260	—	—

Taking into account the extent of irrigation and sailáb cultivation, the large amount of camel carriage existing in this tract (see reply to question 18), the great facilities for river carriage on the Indus and

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PUNJAB.

Major Wace.

Jhelum, and the fact that no severe distress occurred in this tract during 1860–61 and 1868–69, there would appear to be no urgent reasons of famine protection for extending railways to it.

The opening of railways in the province has certainly both equalised prices and stimulated trade.

As instances of the stimulation of trade by the railways, we have the large exports of grain during the Bengal famine, and again during the late Madras famine, and to Bombay for the trade with Europe. During the Bengal famine, between the 15th November 1873 and 31st March 1874, there left the province eastwards by railway—

	Maunds.
Wheat	594,788
Barley	647,375
Gram	646,725
Jowár	670,959
Rice, maize, and other grains and pulses	736,936
Total	3,296,783

equal to 117,742¼ tons. Subsequently, the net exports of food-grains (exports minus imports) across the east boundary of the province have been :—

—	By native Land Carriage.	By Railway.	Total.
1874–75	876,079	2,840,548	3,716,627
1876–77	—293,611	420,021	126,410
1877–78	688,408	6,835,709	7,524,117

These are broad instances of extensive movements of grain to meet trade demands at a distance, which would certainly have been impossible, except in a much smaller degree, but for the railways. Similarly, in the reply to question 20, it will be seen that the trade which the Ravi used to carry has been transferred to the Lahore and Mooltan Railway, and that the extension of the line to Sind is likely to have a similar effect on the Sutlej trade.

It is not so easy to give facts showing how the railways have operated to equalise prices, because prices in every district depend on many influences, of which that of the railways is only one. But no one who has watched the operations of trade in the Punjab towns will have any doubt of the fact. The grain dealers receive immediate advice of the fluctuations of prices in the large marts with which they usually trade; advice conveyed as frequently by telegraph as by the post, and no chance of a successful transaction is missed by them. These are not the sort of men to be ignorant of the relative cost of road, river, and railway carriage,* nor of the fact that the railway is not only the cheapest, but also by very much the most expeditious, of the three.

The following statement, if examined, will show some of the difficulty that there is in tracing by existing prices the influence of the railways. The prices of districts off the railways follow very closely those of towns on the railway. And it is by the provincial exports and imports rather than by bare prices of adjacent districts that the influence of the railways is most easily traced.

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* See the last paragraph of my replies to questions 18 and 20.

AVERAGE PRICE of WHEAT in the PUNJAB during the 4 YEARS 1873 to 1876, stated in SERS of 80 TOLAHS each per RUPEE.

At some of the Principal Marts of Districts south of the Sind, Punjab, and Delhi Railway.				At the Principal Marts on the Sind, Punjab, and Delhi Railway between Delhi and Mooltan.			At some of the Principal Marts of Districts north of the Sind, Punjab, and Delhi Line of Railway.			
—	Sers per Rupee.		Distance from Sind, Punjab, and Delhi Railway in Miles.	—	Sers per Rupee.		—	Sers per Rupee.		Distance from Sind, Punjab, and Delhi Railway in Miles.
	Wheat.	Bájra.			Wheat.	Bájra.		Wheat.	Bájra.	
Karnál	23	23	47	Delhi	21½	25	Gurdáspur	25	20	42
Hissar	21	29½	104	Ludhiána	24½	27½	Siálkot	22	25	87
Ferozepore	25½	33	51	Amritsar	23	26	Jhelum	25	30½	103
D. G. Khan	21	29½	33	Mooltan	19	23	Rawalpindi	25	33	170
							D. I. Khan	29	40½	138
							Jhang	23½	27	60

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

NORTH-WESTERN PROVINCES AND OUDH.

An ordinary railway map will show more clearly than any verbal description the extent to which railway communication has been developed in these provinces. The East India Railway traverses them from their south-east corner as far as Delhi, sending off at Allahabad a branch to Jabalpur, which, meeting there the Great Indian Peninsula line, places these provinces in direct connection with Bombay as well as Calcutta. The Oudh and Rohilkhand Railway joins the East Indian Railway at Benares on the east, and, running in a curve through Oudh and Rohilkhand, meets the other line again at Aligarth in the west. From Lucknow, near the centre of the curve, a branch line has been thrown out, meeting the East Indian Railway at Cawnpore. Opposite Delhi, the Scinde, Panjáb, and Delhi Railway forms a continuation of the East Indian Railway to the Panjáb.

These three lines (the East Indian Railway, Oudh and Rohilkhand Railway, and Scinde, Panjáb and Delhi Railway), are all broad-gauge and in direct connection with one another at all points where they meet, with the exception of the Oudh and Rohilkhand

Railway, at Benares, where its terminus is separated from the East Indian Railway by the river Ganges, as yet unbridged, though the construction of a bridge is under contemplation. The provinces are therefore traversed by two parallel broad-guage systems, the East Indian Railway, and Scinde, Panjáb, and Delhi Railway, on one side of the Ganges, and the Oudh and Rohilkhand Railway on the other. But the latter is subordinate to the former, with respect to which it performs at the same time the functions of feeder and competitor. Out of 47 districts in the North-Western provinces and Oudh, 24 are brought into contact with one or other of the railways.

The East Indian and Scinde, Panjáb, and Delhi Railways, in their course up the provinces, either pass through most of the chief trading centres of the Doab or are connected with them by short branch lines (as is the case at Benares, Agra, and Delhi). An important exception is the town of Farukhabad, which is left at a distance by the bend to the south which the East Indian Railway makes in its approach to Agra. Out of 35 districts in the North-Western provinces 15 are traversed for some portion of their length by the above railways.

The second system has placed all the chief towns in Oudh and Rohilkhand in connection with the East Indian Railway, and passes through nine out of 16 districts included in these two tracts.

In addition to these broad-guage lines there is a short narrow-guage line connecting the towns of Muttra and Háthras, which represents the first experiment made in these provinces of the construction by Government of light railways as feeders to the main lines. The profits are four per cent., and as far as regards local traffic the only trade now carried on has probably reached a maximum, but it will be seen from the map that it is proposed by Government to extend this line from Muttra to Achnera, and thus effect a junction with the light railway which runs from Agra to Rajputana, an extension which will attract to this line much of the traffic which now runs between these provinces and Rajputana viâ Agra, and may add to the receipts

It is now proposed to commence a system under which, each year, a certain sum will be laid out in light-railway construction; and those lines, the direction of which has been more or less definitely determined, are marked on the appended map. The question of the comparative cheapness of roads and railways has formed the subject of much discussion. Sir J. Strachey, when Lieutenant-Governor, was much in favour of the construction of a network of light railways throughout the provinces, which, while adding to the receipts of the main lines by feeding them with traffic, would develop the resources of the tracts through which they passed, and would gradually relieve Government of the expense of maintaining a great number of metalled roads. The advantages of a railway over a road, apart from military or political considerations, may be considered proved if only sufficient traffic will take the railway to make it pay the bare interest on the money expended in its construction. In order to secure this object as far as possible, these light-railways should follow the present lines in which the trade of the country runs, and should be thus provided with the minimum amount of traffic which will make them pecuniarily successful. It is in determining the direction and extent of traffic streams that the collection of trade statistics are most useful.

Speaking generally, the trade of these provinces may be said to run in two streams lengthways and four streams crossways.

The two former are—

(I.) Along the Ganges-Jumna Doab belt through Benares and Lower Bengal and Calcutta.

(II.) Along the penultimate belt to Patna and Calcutta.

These two lines meet at Patna, below which they form one stream connecting these provinces with the port of Calcutta.

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

The four streams which run across or into these two main streams, are—

(I.) From Rohilkhand and West Oudh to the Doab. This stream may be subdivided according as it merely acts as a feeder to the main trunk line of the Doab, or as it actually crosses it on its way to the Panjab or Rajputana. So much as is a feeding stream divides, one portion passing up into the Upper Panjáb by the Sindh, Panjáb, and Delhi Railway, the other passing down towards Bengal by the East Indian Railway. The cross streams converge at Delhi for the Panjáb, and at Agra for Rajputana.

(II.) From Bundelkhand to the Doab. This stream may be considered merely a feeder to the East Indian Railway, which it meets at Cawnpore.

(III.) From the easterly districts of Oudh and the Benares division districts, which are south of the Gogra, to the East Indian Railway, which it meets at Allahabad, Gházipur, &c., and other places. This stream is merely a feeder to the East Indian Railway.

(IV.) From the districts of Oudh and the Benares divisions, which are north of the Gogra, towards the Gogra.

In great part this stream merely feeds the Gogra, but a portion comes over to the East Indian Railway, which it meets with at Benares or Ghézipur.

To apply these remarks to the railway communication which at present exists, Trunk line No. 1 is almost entirely provided for by the Sindh, Panjáb, and Delhi and East Indian Railways, and will be entirely provided for when the proposed line from Cawnpore to Farukhabad and Kásganj is completed.

Trunk line No. II. is partly served by the Oudh and Rohilkhand Railway, which has diverted a large portion of it viâ Benares. There is still, however, an enormous trade down the Gogra, amounting in 1877–78 to some 43½ lakhs of maunds (about 155,360 tons). What trade now follows this line is carried entirely by the Gogra, there being no good road or railway to compete with it. It has been to a great extent proved that in North India a railway can compete successfully with a river, and a line connecting Upper Oudh with Chapra running down the Gogra-Gandak Doab is likely to prove a financial success if the expense of bridge-making is not too great an obstacle.

Side stream (I.), so far as it is a feeder to the upper Panjáb, is carried by the Oudh and Rohilkhand Railway line to Aligarh for the eastern districts of Rohilkhand and the western districts of Oudh; for the eastern districts of Rohilkhand it travels by road. The proposed line from Bijnor to Sahâranpur is to carry this latter.

So far as it is a feeder to trade going down country, it is efficiently carried by the Oudh and Rohilkhand Railway line from Moradabad to Aligarh, and from Lucknow to Cawnpore.

The cross streams to Delhi and Agra, which also are a portion of side stream (I.), are carried more or less completely by the Aligarh and Cawnpore lines of the Oudh and Rohilkhand Railway. The portion which runs to Delhi from the Bijnor district and the westerly portion of the Moradabad district, at present travels by road, and a line from Bijnor to Muzaffarnagar would be of great use in carrying it. The stream is an important one.

Side stream No. II. will be carried by the proposed line from Cawnpore to Mau Ránipur. At present it travels by road. There is a great doubt whether it would not be better to connect Bundelkhand with East Indian Railway line south of Allahabad, and divert the course of the trade from its present line to one more convenient for it.

Side stream No. III. will be carried by two lines, one through the Partabgarh district, the other through Gházipur and Azamgarh; both will meet the East Indian Railway, with which Ghâzipur is to be connected by a short line now almost completed.

Side stream No. IV. will be carried by the line from Bahraich to Gonda and Nawábganj, on the Gogra.

AP.I. QN. 19.

NORTH-WESTERN ROVINCES ND OUDH.

Mr. Buck.

The map shows more clearly than any description what portions of these provinces are at present isolated from railway communication. It will be seen that, as soon as the proposed light-railway system is completed, the portions of the provinces which will be at any great distance will only be the northern portions of Kumaun and Gharwál, the southern portion of Mirzapur, and the Lalitpur districts.

At present the tracts furthest removed from a railway station are the four above named, together with the districts of Gorakhpur and Kheri.

The distances of these places from the nearest accessible railway station are approximately noted below: the distance is taken from the district head-quarters, unless the contrary is stated:—

Kumaun (Almora) - -	105 from Barielly.
Garhwál (Paori) - -	106 ditto.
Lalitpur - - -	139 from Karauli. 197 from Cawnpore.
Mirzapur, southern parts of district are about 100 miles from Chunar.	
Gorakhpur - -	76 from Zamániah, but the north of the district is some 60 miles still farther.
Kheri - - -	90 from Lucknow, but the north of the district is some 45 miles still farther.

The extent to which railways have stimulated trade may be gathered from facts noted in the reply to question 17, and it follows of course that by doing so they have greatly tended to equalise prices. In November, 1878, for instance, the price of bájra in Cawnpore was Rs. 2 per maund; export commenced to Bombay, where prices were high (about Rs. 3-5-0 per maund), and in three days the price of bájra in the Cawnpore market rose to Rs. 2-3-0.

In connection with this subject, the following remarks may be quoted from the famine replies of Lucknow and Fyzabad:—

Lucknow.—"The railway has stimulated trade to a certain extent. The railway, river, good bridged roads, and the fall of the value of silver as regards its value to gold, all taken together, have had the effect of equalising prices and stimulating trade to an important extent. As regards this I give the following facts:—

"At one small station alone, Malihabad, the export traffic of grains increased from—

564 tons in 1875
to 7,050 tons in 1876, and
to 70,855 tons in 1877

"*Fyzabad.*—Of the effect of the railway in equalising prices there can be no donbt. It is sufficiently illustrated by the table I subjoin of the exports and imports at the Fyzabad Railway station in the first fortnights of each month since the beginning of the year:—

Fortnight ending	Imports.	Exports
	Maunds.	Maunds.
15th January - - - -	2,243	7,990
15th February - - -	7,499	6,667
15th March - - - -	2,896	8,577
15th April - - - -	4,871	4,095
15th May - - -	2,652	12,310
15th June - - - -	30,000	4,258
15th July - - -	23,508	3,361
15th August - - -	35,852	4,668
15th September - - -	5,883	1,497

"These fluctuations show that trade is very sensitive to changes in price along the line of railway."

A more striking instance of the movements of grain within the province by rail, and on a larger scale, is afforded by the table on pages 19 and 20 of reply to Question 17, which shows the wave which set in from October, 1877, to March, 1878, to have been completely reversed in the succeeding two months, a fortunate harvest having changed Agra and Rohilkhand from the head of the importing to the head of the exporting blocks.

BENGAL.

BENGAL.

r. Toynbee.

Railways.—The Provincial Railway map shows the railways completed, in progress, and proposed for early construction, and will serve to indicate that, although a good deal has been done, far more remains to do before the communications of the province can be considered as in any way adequately provided for. It shows, indeed, that Bengal is at present, in the matter of railway communication, behind the other provinces of India, and it will be remembered that the want of railway communication was most seriously felt during the Orissa and Behar famines.

The Tirhoot Railway, constructed temporarily during the Behar famine of 1874, and now completed as a permanent railway to Durbhunga and Mozufferpore, facilitates communication with some of the districts which then suffered severely, but it must be extended both east and west to secure the districts against any recurrence of such severe scarcity, but nothing has yet been done towards railway communication with Orissa.

The total length of completed railway, both guaranteed and State, in the province is 1,235 miles; the districts through which each railway passes are noted below:—

East Indian Railway.—Including both loop and chord lines and short branches, 711 miles of this line are in Bengal, passing through the districts of Hooghly, Burdwan, Beerbhoom, Moorshedabad, Bhagulpore, Monghyr, Patna, and Shahabad, and skirting the Sonthal pergunnahs on both east and west.

Eastern Bengal Railway.—This line, 170 miles in length, including the Dammookdea branch, skirts the northern part of the 24-Pergunnahs district, and passes through the Nuddea district and the northern portion of the Furreedpore district.

The lines of State railway completed are:—

1st.—The Calcutta and South-Eastern, 28 miles, which is in the 24-Pergunnahs district, and connects the Mutlah river with Calcutta and the Eastern Bengal Railway.

2nd.—The Nulhatee line, 27½ miles, in the Moorshedabad district, which connects the East Indian Railway with Azimgunge, on the Bhagirutty.

3rd.—The Northern Bengal Railway, 219 miles, which is a northerly extension of the Eastern Bengal Railway, and passes through the districts of Rampore Beauleah, Bogra, Dinagepore, Rungpore, and Julpigoree.

4th.—The Tirhoot Railway, 79 miles, which connects Mozufferpore and Durbhunga with the East Indian Railway at Barh.

The only new railways under construction in the province are the Patna and Gya line, 58 miles in length, serving a portion of the Behar district, and a short extension of the Rungpore branch of the Northern Bengal Railway to the River Teesta, so that at present the eastern districts of Dacca, Mymensingh, Tipperah, Jessore, Backergunge, Noakholly, and Chittagong, the northern districts of Purneah, Maldah, Sarun, and Chumparun, and in

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BENGAL.

Mr. Toynb

the south and west the district of Midnapore, and the whole of Orissa and Chota Nagpore, are without railway communications.

Surveys have been made—

(1.) For extending the Tirhoot Railway from Mozufferpore into the Chumparun district to the west, and from Durbhunga into North-East Tirhoot;

(2.) For a railway in continuation of the Eastern Bengal Railway to serve Dacca and Mymensingh;

(3.) For extending the Calcutta and South-Eastern Railway into the heart of the 24-Pergunnahs district;

(4.) For a line from Rungpore to Dhubri, on the Brahmaputra;

and, if money can be provided, these lines will be put in hand at once, and will, when completed, be a very important addition to the communications of the province.

A survey has also been made for a line to connect the Tirhoot and Northern Bengal Railway systems, passing through North Bhagulpore, Purneah, and Dinagepore districts; but this line cannot at present be carried out, as there is little chance of its fulfilling the primary conditions now attached to all railway projects, that they shall be commercially remunerative.

Further lines are projected, but it will necessarily take a long time before the railway communication of the province will be developed to the full extent desirable.

Many parts of Chota Nagpore and of Orissa would contribute largely to the food supply of the country if it were not for the present difficulty of carriage. A railway has been talked of for many years to connect Calcutta with Midnapore and Sambalpore, but it is scarcely probable that this can be undertaken for many years, although it is certainly most desirable to extend the benefits of railway communication to these isolated districts, in order to facilitate the introduction of food in time of scarcity or famine.

A railway is also much wanted to open up the north-west portion of Chota Nagpore; another is wanted to connect Chittagong and Commilla with the Dacca Railway system; and one of the most important of all the railway requirements of the province is a line to connect the Sunderbuns through Jessore with Calcutta, connected with a line serving directly Kishnaghur and Moorshedabad.

The effect of the existing railways has certainly had the effect of stimulating trade to a remarkable degree. It is only necessary to show this to refer to the traffic returns of the East Indian Railway and Eastern Bengal Railway for a few years back to see how great has been the increase in trade by rail. A corresponding increase has doubtless obtained in the water-traffic, with which the railways compete,—year by year with more success. The following figures will illustrate the effect of improved communications on prices, and show how they tend generally to raise them:—

1.	2.	3.	4.	5.	6.
Period.	Average Price of Common Rice—Seers per Rupee—in Districts provided with Communications.				Remarks.
	By Rail, Road, and River. (11 Districts.)	Rail and Road only. (3 Districts.)	River and Road only. (12 Districts.)	Road only. (16 Districts.)	
1862–1873 - -	19·6	22·0	21·7	23·3	Average price.
1874–1878 - -	16·7	18·6	18·9	21·8	
1862–1873 - -	17·6 to 23·2	18·1 to 24·3	17·3 to 26·3	11·7 to 34·7	Range of price.
1874–1878 - -	14·6 to 18·4.	17·8 to 19·2	16·2 to 20·8	11·4 to 29·0	
1862–1873 - -	5·6	6·2	9·0	23·0	Difference between highest and lowest price.
1874–1878 - -	3·8	1·4	4·6	17·6	

The 11 districts in column 2 are Burdwan, Hooghly, and Howrah, 24-Pergunnahs, Nuddea, Moorshedabad, Furreedpore, Patna, Arrah, Monghyr, and Bhagulpore. Those in column 3 are Bankoora, Sonthal pergunnahs, and Hazareebagh.

The 12 districts in column 4 are Midnapore, Maldah, Rajshahye, Rungpore, Pubna, Dacca, Backergunge, Mymensingh, Noakholly, Tipperah, Tirhoot, and Sarun. Sixteen other districts are in column 5. It is not claimed in grouping these districts that the classification is absolutely correct; it is based on the principally used and most important communications of each district. Only the East Indian and Eastern Bengal Railways are taken into account, the State railways not having been in full working order during the period embraced. If we leave out the figures in column 3 as averages obtained from too small a number of districts, the result is very striking, and shows not only that good communications have a tendency to equalise prices, but have also a tendency to raise them permanently. The period 1874 to 1878 may be taken to represent a period of unusual commercial activity as regards food-grains, owing to the famines in Bengal, Bombay, and Madras, and scarcity in the North-Western provinces.

CENTRAL PROVINCES.

CENTRA PROVINC

Mr. Nich

The East Indian Railway from Allahabad to Jubbulpore runs for 68 miles from Jokai into the Jubbulpore district. This line is continued through the centre of the Nerbudda valley, traversing the Jubbulpore, Narsinghpur, Hoshangabad, and Nimar districts, and passes on to Bombay.

From Gadarwara, a great mart in the Narsinghpur district, a branch, about 15 miles in length, connects the Mohpani coal-mines with the main line of the Great Indian Peninsula Railway.

From Khandwa, the Holkar State Railway runs (through the Nimar district for 36 miles) north-west

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ENTRAL ROVINCES.

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to Mhow, Indore, and Rutlam, to be continued to Neemuch.

From Bhosawal in Khandesh, near the borders of the Bombay presidency, a branch of the Great Indian Peninsula Railway, 243 miles in length, running through Berar, traverses the Wardha district in its greatest breadth, and terminates at Nagpur. Within these provinces its length is 67 miles.

From Wardha, a State railway, 45 miles in length, branches off, and, running through the celebrated cotton mart of Hinganghat, connects the coal-fields of Warora in the north-west of Chanda with the Great Indian Peninsula system of railways. The great iron and limestone field of Lohara is about 60 miles east of Warora. Chanda is distant 28 miles, below which navigable stretches of rivers commence. Lohara is in the North-eastern Chanda rice-field.

From Nagpur a State railway has been very recently commenced, and will run through the military station of Kamptee eastward through the Bhandara rice field to Kullianpur, the western portal of Chhattisgarh, distant 125 miles. In the province there are 550 miles of railway open and 59 stations.

The existing railways do not traverse the Saugor, Damoh, Mandla, Balaghat, Bhandara, Raipur, Bilaspur, Sambalpur, Seoni, Chhindwara, and Betul districts. The distances to be gone are shown in table overleaf.

Sambalpur is so isolated that, if expense be no object, if the chance of its being of use to prevent starvation, say three times in a century, be a sufficient ground for recommending a railway to Sambalpur, then I should point to this district.

The case of Chhattisgarh is different. Even in times when there has been an abundance of food, sufficient to allow of large exports, when grain has been procured for money at rates which some 170 miles westward would be considered high, but not very high, untold deaths from starvation have occurred; plenty lulled the people into fancied security, cheapness was the "lotus" which they eat; that cheapness has been their curse. I can remember the time when the sentiment of Sir Richard Temple, that he hoped to see cheapness driven from her last stronghold in Chhattisgarh, was ridiculed. Time has proved him right. So long as there was this land-locked home of cheapness, thrift, industry, enterprise, were works or virtues of supererogation. All but a few were miserably poor amid the plenty, dependent on the few exceptions for life itself, without resources or credit in a time of distress. The opening up of the country, however imperfectly, by the Great Eastern road, has permanently raised prices and called forth the latent energy of the people. The opening of the railway will give a stimulus, an impetus, of almost immeasurable force. When the railway was opened in the Nerbudda valley, the sudden rise of prices, till a general rise of wages followed, was felt by the people with no little severity; but it was just the sting of the mustard plaster, afterwards promoting the more healthy circulation of the sluggish stream of life.

The Chhattisgarh, "land of threshing floors," will, by means of this new railway, become connected with Nagpur. The question arises whether Jubbulpore and the countries in railway communication with Jubbulpore might not, with advantage, as a mutual protection against famine, be connected with the Chhattisgarh country. The lead viâ Nagpur and Bhosawal to Jubbulpore or to the portal of Chhattisgarh, as the case might be, would be very long. The nearest point of this new railway to Jubbulpore would be at or near Tirrora, in Bhandara. North of this is the rich valley of the Upper Weinganga. A railway in this direction would have to cross the drainage of parts of Seoni or of Balaghat, but it would protect the Balaghat lowlands and tend to bring under cultivation large tracts in the highlands of Balaghat and Mandla. The distance by rail from Kallianpur to Jubbulpore would be reduced to something over 215 miles, of which 175 probably would be the length of this connecting line. Without this connecting line the distance from Kallianpur to Jubbulpore by railway would be 748 miles. The distance from Raipur to Jubbulpore over the Bajadhar ghat and through Mandla is 203 miles. This connecting line would also shorten the railway-traffic distance of Jubbulpore from Nagpur by some 353 miles. But as to the cost and engineering difficulties of such a line I know nothing.

The district of Damoh is somewhat isolated, not by reason of great distance, but by physical causes; scarped hills with very few practical passes shut off its southern portion (which, however, is but very thinly inhabited) from Jubbulpore and Narsinghpur. One brinjara track leads to the railway at Chhindwara, a busy town and station in the Narsinghpur district, another to the Shahpura station, in Jubbulpore. The military road from Saugor to Jubbulpore, passing through the head-quarters of the district, traverses the Singrampur Kattanghi pass. Eastward from Damoh an indifferent road, saddled with transit duty in the independent state of Panna, meets the East India Railway at Murwara and Jokai. To the north it is shut in by the Vindachal hills, with but few brinjara tracts through Bundelkand. On the west it has access by one road to Saugor, by another viâ Garhakotah and Rehli to Bhopal and Malwa, and, more important still, to the railway in Narsinghpur. Otherwise it may be said to be land-locked. But its highest capabilities would probably not support a railway, or even a section of a railway; and its existing means of access to grain stores, if it could pay for its requirements, are probably sufficient.

The sub-division of Sironcha, lately the Upper Godavari district, is very isolated. It is small and self-reliant.

Question.—Has the effect of the existing railways been to equalise prices and stimulate trade to any important extent?

Certainly, the railways have in a marked manner tended to equalise prices, not only in the districts to which they have been extended, but to great distances around. Karbi, the dry fodder stalks of the jowari plant, have been sent from Nagpur so far as Akola, 158 miles distant, till it could only be sold in Akola at a loss. The dry mhowa flower, ordered for Bombay, has been collected from the jungles and accumulated at Nagpur, having been countermanded, owing to the levelling of the rates at Bombay and at Nagpur.

In support, I quote from a memorandum of the chief engineer, Central Provinces, on the Chhattisgarh Railway:—

"Perhaps some idea of the cost, wear and tear, and difficulty attendant on the transport of grain from Raipur to Nagpur may be formed from a perusal of the subjoined figures, taken from the price current of the last few years. I compare in each case the price at Raipur* with the prices one month later in the districts which draw their food supplies from Chattisgarh.

"Table showing the number of seers of food grains sold for one rupee at—

	Raipur.	Nagpur.	Warha.
Rice in January and February 1865	12	7	5
Wheat in March and April 1866	13	9½	8⅝
Rice in January and February 1867	12	9	7
Wheat in March and April 1868	52	18	17
Rice in January and February 1869	9½	6	5
Wheat in March and April 1870	19	12½	13

"From these figures it may be deduced that food selling at 19 seers per rupee cannot be put down at Nagpur under nine seers a rupee. It is very different when food comes by railway. Last year, in the months of scarcity, a good deal of jowari (millet) was imported in Nagpur from Akola, a place on the Great Indian Peninsula Railway, 158 miles west of Nagpur. Consignments of grain were only two days

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* From Raipur to Nagpur, 180 miles.

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Central Provinces.

Mr. Nicholls.

on the road; 360,000 maunds came into Nagpur by railway during the year. Yet the difference between Akola and Nagpur prices was only two seers a rupee; thus the number of seers of millet sold for one rupee as per published price current at—

	Nagpur.	Akola.
In March 1869 - - -	14	17¾
In April 1869 - - -	15	17
In May 1869 - -	15	16½."

I think this one example is quite conclusive as regards the equalisation of prices rendered possible only by the opening of the railway to Nagpur.

I give the following extracts from our Government records to prove how vastly the existing railways have stimulated our trade:

Increase of traffic for the whole province:—

	Tons.	Mds.
1863–64 - -	102,341	3,909,008
1864–65 - -	134,719	4,386,251
1865–66 - -	136,265	5,519,766
1866–67 - -	175,561	6,517,864
1867–68 - -	196,432	6,110,897
1868–69 - -	209,089	6,795,263
1869–70 - -	237,044	7,144,465
1870–71 - -	235,189	6,965,244
1871–72 - -	350,138	8,091,546
1872–73 - -	244,569	6,935,492
1873–74 - -	326,918	7,747,732
1874–75 - -	310,923	7,737,823
1875–76 - -	353,620	8,113,619
1876–77 - -	390,106	6,990,631

No doubt some part of the increase in trade is due to our increased population, our moderate settlement, and influences beyond our borders; but much of the increase is the direct result of the opening up of the country by the railway, and became only possible through this means of cheap and rapid communication.

Next, I will show, in a table, some of our newly created export trades, due almost, if not entirely, to the railways:—

EXPORTS.

—	1874–75.		1875–76.		1876–77.	
	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.
Linseed and other oil seeds -	808,806	25,88,685	1,718,917	48,43,908	1,435,520	46,94,567
Wheat, rice, and other crops	2,756,928	49,53,060	3,412,534	53,77,861	5,311,416	99,42,201
Ghee and edible oils - -	40,820	5,61,953	46,227	8,10,887	52,310	11,14,173

Our older established trades are thus shown—

—	1863–64.		1868–69.		1876–77.	
	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.
Cotton exported -	372,521	1,21,93,334	299,099	65,35,173	221,048	39,13,926

Of course, in judging of these figures we must look to the quantities more than to the value, for the rates during the American war were extravagantly high.

IMPORTS.

—	1863–64.		1868–69.		1876–77.	
	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.	Quantity in Maunds.	Value, Rs.
Cotton piece goods - -	27,545	46,15,337	102,531	1,01,19,260	104,512	87,23,494
Hardware - - -	32,824	11,44,319	*206,178	72,81,609	*185,191	22,18,313
Salt - - - - -	600,899	26,73,170	856,470	51,55,589	987,323	39,96,410
Saccharine produce - -	200,528	23,30,614	190,651	16,53,729	274,160	23,34,620
Cocoa and other nuts -	33,294	5,03,689	107,961	10,33,376	114,944	11,82,467

* Includes railway paint cotton presses machinery.

BERAR.

Berar.

Mr. Dunlop.

The effect of the existing railways has undoubtedly been to equalise prices, and to stimulate the trade of the province to a very great and important extent.

Before railway extension the outlet for our produce was a long and tedious road route. Now, with telegraph and railways, we are in direct communication, not only with other parts of India, but with other parts of the world.

Prices of cotton in Berar are ruled by the changes in the Liverpool market, and the effect of a frost on the cotton crop of America at once affects the rates in the Khamgaon market.

In support of the above view I cannot do better than give the following extract from a report by the Cotton Commissioner in 1869:—

"By the introduction, too, of an improved class of full-press, which, even in the dry atmosphere of the Berars, turns out a bale containing 3½ cwt. of cotton net, and by the liberal terms accorded by the Great Indian Peninsula Railway Company to the well-packed cotton, and by the regularity with which the consignments are delivered in Bombay, the cost of the carriage of our produce from the market to the seaboard has been greatly reduced; and the delay and

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Berar.

Mr. Dunlop.

loss, and expense and trouble, attending the transport of our cotton from the interior to Bombay are now legends of the past.

"Few can be more sensible than I am of how much this great gain is due to the arrangements of the Great Indian Peninsula Railway Company; and at the end of this, another season, I would desire to bear testimony to the benefit that has resulted to the cotton trade of our provinces by the excellent arrangements of the traffic department,—a view in which your chamber will, I doubt not, heartily join."

Since I commenced this letter I have quite by chance come upon an extract from a report which was quoted some years ago by the late Governor of Bombay, Sir Bartle Frere, the Member of the Supreme Council in Calcutta, in a letter addressed to an officer in Central India, in which he urged the improvement of the means of communication between the cotton markets and the sea-ports. This extract (from the report of General Balfour, C. B.) so correctly describes the condition of the trade at a comparatively recent date, that I cannot resist the temptation of inserting it here. It will show those whose introduction to the cotton trade in the interior has been subsequent to the completion of the railway the very great change that has taken place during the last few years, and will help to remind us of the importance of perfecting the communications in the cotton districts, if we desire to ensure the stability of the trade.

General Balfour wrote:—

"Formerly the greater part of the cotton was taken 500 miles on bullocks to Mirzapur on the Ganges, and thence conveyed on boats, 450 miles, to Calcutta. Now, the greater part goes to Bombay,* still wholly on pack-oxen, the distance varying from 126 to 450 miles, according as the cotton is purchased at one mart or another. The hire of a bullock for the journey ranges from about Rs. 5 to 16, the chief cause of variation being the time of year: a load is about 250 lbs. But this is not by any means the whole cost of conveyance; the indirect expenses are much greater,—the cotton is eaten by the bullocks, stolen by the drivers, torn off by the jungles through which the road passes, and damaged by the dust and the weather, as well as by having to be loaded and unloaded every day, often in wet and mud.

"The Bombay Cotton Committee† of 1847 state their opinion, after careful calculation, that the whole charges of conveyance to Bombay from the mart of Khamgaum, only 216 miles distant, being the nearest of all, do not fall short of Rs. 33 a candy (784 lbs.), the original cost of which at the latter place is not more than Rs. 50: thus the cost of carriage to the port of shipment is 66 per cent. on the price of the commodity. The usual selling price in Berar is under one anna ($1\frac{1}{2}d.$) a lb., as we learn from Royle, as well as from the paper just quoted and other authorities: the absolute cost of the conveyance from the producing country to Bombay is, therefore, fully 1*d.* a pound. And this, though it seems small, is in fact enormous on so low-priced an article; so that in the report of the Cotton Committee above referred to, the rise of even one half-penny a pound at Liverpool is spoken of as operating most beneficially on the Bombay market.

"And we cannot regard the formation of good roads as less important or less essential to the prosperity and advancement of the country than the extension of irrigation. The two species of improvement are intimately connected, and should go hand in hand. Without the means of transport and of interchange the most valuable products become a drug, and production is arrested; thus roads give value to produce, and large production gives a use and value to roads. No advantages can make up for the want of the means of transport; at the present time good wheat is selling in the Berar valley at Rs. $5\frac{1}{2}$ (11*s.*) the quarter, and the whole cost of freight and charges from the coast to London do not exceed 15*s.* a quarter; yet in the absence of good roads, and of all attempt to improve the noble Godavery for navigation, the cost of carriage from the place of production to the coast effectually keeps it out of the market. For at present the only means of exit for the produce of Berar is by carriage on pack-oxen, either to Bombay, a journey of 60 days, 400 miles to Mirzapur on the Ganges, and then 500 miles down that river to Calcutta; whereas if the Godavery river, the natural outlet of that country, were opened to navigation, the cotton and other valuable produce it yields would reach the sea-port of Coringa at its mouth in 70 hours. On the other hand, a ton of salt, which is sold at the Government stores on the coast for Rs. 27, costs Rs. 112 at Nagpur. We have already adverted (para. 433) to the enormous yearly loss in the carriage of the cotton of the same country to the sea-coast by land instead of by the river, and have noticed what large supplies of that article of the best quality for the English market would immediately flow out if the navigation were opened."

In comparison with the above, produce is now forwarded from Khamgaon to Bombay at the following rates, viz.:—

	Rs.	a.	p.	
Cotton - -	36	6	8	per ton;
Grain - -	14	9	0	do. ;

and it is freely despatched to wherever there is a demand for it.

Another fact that supports the above view is the extension that has taken place in cultivation. In 1869–70 the cultivated area was 5,361,375 acres, and in 1876–77 it was 6,413,561, showing an increase in seven years of 1,052,186 acres.

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* Present cost of the conveyance of the Berar cotton to the port of shipment.

† I was a member of the Committee, and all our calculations were under the mark.

(Signed) H. E. B. Frere.

Bombay.

Mr. Peile.

BOMBAY.

The railways in the Bombay presidency are—

1. The Baroda line, which runs north along the coast, traversing the collectorates of Thana, Surat, Broach, and Ahmedabad successively. The continuation towards Ajmere will traverse the northern part of Ahmedabad, and the continuation to Patri and Wadhwan traverses the western part and gives access to Kattywar. A branch to Pali runs for 32 miles through the eastern part of Kaira. Few villages in Gujerat are 30 miles from the railway. The effect of the railway has been to stimulate trade. The weight of goods carried from the stations in Kaira in 1868 was 31,138 tons. Since the Pali branch was opened this has increased to 107,914 tons in 1877.
2. The Great Indian Peninsula, which runs eastward from Bombay and traverses the Thana district, Nassick, and Kandesh by its north-east branch, and Thana, Poona, and Sholapur by its south-east. The chord line from Munmar to Dhond, joining these branches above the ghats, runs through part of Nissick, Ahmednagar, and Poona. Parts of Nassick are 90 miles from the line. It runs through the eastern talukas of Kandesh, and the western are from 84 to 108 miles from the line. A State railway to join Kandesh with Gujerat has been discussed, and will facilitate the transport of grain. The most remote part of Poona is 60 miles from the line, of Sholapur about 50. So far, the railway facilities in Bombay are fair, and no new line is urgent. But in the southern districts the case is different.

Major-General Wilkins.—There are no railways in the southern division. As far south as Belgaum the

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BOMBAY.

nearest railway station is at Poona, 212 miles distant from Belgaum, 140 miles distant from Kolapur, 70 miles distant from Sattara.

The Dharwar district is nearer to Bellary than Poona; but the railway at Bellary does not serve Dharwar and Hubli, as more speedy communication between those towns and Bombay is to be obtained by sea, or by Poona.

Considering the importance in military, political, and commercial points of view of the head-quarter stations of Sattara, Kolhapur, Belgaum, and Dharwar, which are all garrisoned by troops, their communications, though good of the kind, by sea and by road, are far behind the spirit of the age. Here is the frontier district of Dharwar, a district having a large trade in cotton and seeds, no less than 272 miles from its central mart at Hupli to a railway. Bellary is 130 miles distant only, it is true; but the railway there goes in the wrong direction to serve the people and the trade.

Three railways are needed in the southern division—

1. A line to serve the Kaladgi collectorate from the G. I. P. Railway. This line up to the Krishna river would be sufficient at present.
2. A line from Karwar to Bellary.
3. A prolongation of the Dhond and Munmar line to serve Sattara, Kolhapur, Belgaum, and Dharwar.

Of the second and third lines, the third is the most important in a political and military point of view The second may be considered to have a priority of importance in a commercial and famine aspect, as opening up railway communication with a new port.

Mr. Robertson.—The district of Sattara has no line of railway, but it has excellent roads in connection both with the railway at Poona and with the coast of Chiplun.

My experience during the late famine was, that in order to supply the districts of the southern divisions, especially Kaladgi, and to secure an ample supply of food in case of famine, a line of rail was absolutely required, extending from the G. I. P. Railway from some points in Sholapur on to Bijapur in Kaladgi, and thence on to Dharwar. Large supplies of grain were in the monsoon sent with great difficulty in carts, by bullock loads, and even by head loads from Sholapur in this division to the Kaladgi district. Had there been a line of rail, much of the distress in that district could have been averted.

There is no doubt that the existing railways have tended to equalise prices, but till the late famine fell upon us this had not been the case.

Till then traders drew their supplies from the local markets, and import by rail was hardly dreamt of. When the famine caused traders to seek distant markets, they were amazed at the result. Since then traders have commenced to seek distant and cheaper markets. The result of the famine has been to teach the people the value of the railway, and thus the railways have now the effect of equalising prices and of stimulating trade in grain to a most important extent.

Mr. Dharwar.—Railways are much wanted in the district. The high price of cart hire raised the price of grain for some time during the famine to 7 lbs. per rupee. The hire of one cart from the coast, 100 miles, was Rs. 50 for some time (the ordinary hire in usual years being Rs. 10 to 20), and the carts never contained more than 10 bags of 168 lbs. each, and generally only eight. The railway fare of a bag would have been merely nominal compared with this cost of Rs. 5 or more per bag. Another effect would have been that, as the railway would have run daily, there would have been no time (as during last rains for a month or six weeks) while the import of grain was stopped, and so prices could never have risen as they did.

But it is clear that the first need is a line in the famine districts of 1876–77 to supply them with grain.

The following lines are among the works projected by the Government of Bombay as safeguards against famine—

1. From Carwar by Hubli and Gadag to the frontier (163 miles).
2. From Gadag by Bijapur to the Barsi Road station on the G. I. P. Railway (220 miles).
3. From Dhond on the G. I. P. Railway by Satara, Kolhapur, and Belgaum, to Dharwar (255 miles).*

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* See Correspondence of 1878; Copy provided.

SIND.

SIND.

Colonel Haig.

The following is the mileage of railway constructed in Sind:—

	Miles.
Sind, Punjab, and Delhi Railway, Sind section, Kurrachee to Kotri - - - -	106
Indus Valley State Railway, Sind section, Kotri to Sukkur, Rohri, and border of Bahawalpur territory - - - - -	310
Total mileage -	416

The above lines traverse a large portion of the Kurrachee collectorate and the entire Shikarpur collectorate. The Hyderabad collectorate, and the large but sparsely populated district of the Thar and Parkar, are not touched by the railway system. Leaving out of question the extreme easterly portion of the Thar and Parkar, where the country is more or less a desert and the inhabitants very few, it may be said that 80 to 100 miles is the greatest distance that separates any Sindhis from the line of railway. An extension of the railway system is not necessary in view to provide against future famine.

32. The Indus Valley line is not yet open for traffic. The Sind section of the Sind, Punjab, and Delhi Railway has been open for 17 years, and, in combination with the flotilla of steamers on the Indus, has undoubtedly greatly stimulated trade, the total value of the import and export trade being now, even during great commercial depression, fully 70 per cent. in excess of what it was previous to the opening of the line.

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These questions have been fully gone into by the consulting engineer for railways, in the note sent by him to the Famine Commission, and the Board consider it unnecessary to go over the same ground. It will be sufficient to mention here that this presidency is well provided with railways, lines passing through 13 out of the 21 districts. Of the remaining eight, six have the advantage of a long seaboard, and of the two non-maritime and non-railway districts, Kurnool and the Nilgiris, Kurnool has a railway on its borders, and the Nilgiris is a small and mountainous tract of country with a railway station within a few miles of the foot of the hills.

Though perhaps no district in this presidency, with its long seaboard, its tolerably good system of roads, railways, and canals, can be considered so isolated as to render extension of railways an absolute necessity, there are doubtless tracts where such extension would tend greatly to facilitate the import of food-grains in times of scarcity when the draught power of the country, which generally consists of bullocks, becomes weakened and inadequate to meet the requirements of

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exceptional traffic through long-continued drought. The consulting engineer has mentioned in his note most of the places to which railway extension would be feasible and of great service. The following opinions of collectors as to the requirements of their districts, as practically shown by the late famine, are here inserted, as they indicate the directions in which inquiries should be made in the event of a large system of railway extension being resolved upon. Without detailed inquiries, however, as to the financial and engineering considerations involved in each scheme, it is not possible for the Board to pronounce any useful opinion on the merits of each, and they will not therefore attempt it.

The collector of Kurnool considers that a light railway in the Cumbum valley, which is from 70 to 160 miles from the north-west line, might be laid with advantage.

The commissioner of the Nilgiris advocates the construction of a line from Mettapolliem to Ootacamund (alluded to also by the consulting engineer for railways) and its extension to South-East Wynad. He remarks, "The great want of this splendid plateau " is a railway, which, in my opinion, would be found " not only to pay, but to afford an immense impetus " to European industry here. I consider that it " should run to Coonoor, and thence up the Kaity " valley to Ootacamund, thence viâ Neddivattum to " Gudalur and South-East Wynad, and so on to such " point as might be selected to connect it with the " projected Mysore Railway system. The late scar- " city of food supplies to the towns in this district " might have been less, if not entirely averted, if " there had been any expeditious mode of transit for " grain, &c., such as a railway affords. The opening " of the railway from Pothanore to Mettapolliem, at " the foot of the Nilgiri district, a distance of 35 " miles, has considerably improved the traffic up the " Coonoor ghat."

The collector of Cuddapah considers that a good new railway would be from Gudiyatam, in the North Arcot district, right through the sub-division taluks of the district, to join the new line at Tadpatri; the want of such a line having been much felt during the late famine, when grain had to be carried at a great cost and little speed.

The collector of Madura states that the single line of railway existing in the district was found unequal to convey the required quantity of food, that a want of sufficient supply in the markets was often felt when prices rose, and that another line of railway from east to west, opening the seaboard on the east, and connecting Palghat and Caimbatore on the west with Dindigul and Madura (recommended also by the consulting engineer for railways), would remedy the evil. He is, however, doubtful whether the project would pay.

The following suggestions have been made by other collectors, not with special reference to the introduction of food supplies in times of famine, but on general considerations of development of the resources of the country and giving a stimulus to traffic.

As regards railway extension in the Vizagapatam district, Mr. Goodrich writes:—

"In the interest of the Chhatisgarh division of the Central provinces, and generally for the good of the empire, the construction of a light railway from the eastern coast towards Raipur is extremely to be desired. Nature has provided a cleft in the range of the Eastern ghats, and no pass over those mountains has to be constructed. The elevation of the villages through which the line should run to Raipur, if that were selected as the terminus, would be as follows, taken at intervals along the line from south-east to north-west:—Vizianagram 150 feet, Parvatipur 350 feet, Rayaghada 450, Kotragarh 880, Ombadola 1,200, Arusurgar 1,000, Tel river 700, Titlagur 750, Bengamunda 776, Karrul 850, Kotingee 875, Kumuora 900, Tirbor 1,000, Sambarsingh 1,100, Naru 1,030, Jonk river 900, Boriagar 973, Belsore 925, Mahandi river to be crossed and so to Raipur, whence a light railway is in course of construction to Nagpur.

"The vast quantities of wheat grown in the Chhatisgarh plain, and the still vaster quantities which may be grown, find their nearest port at Bimlipatam or a point north thereof. The climate of the plateau of the villages in the range which this route pierces produces abundance of oil-seeds in addition to all kinds of forest produce, and the whole tract forming the upper basin of the Mahanadi would use no other salt but that which the salines of Vizagapatam and Ganjam produce, and which now supply for the larger portion of the tract. I should prefer as the easier route a more northerly course, following the 83rd parellel of longitude up to the point where it crosses the Mahanadi, and traversing the Patna and Borasambar zemindaries, tracts of very fertile and level land; but if the Nagpur line is to stop short at Raipur, and not be carried on towards Sambalpore, I would follow the line indicated, viâ, the Jonk river to Raipur. The latter line passes country somewhat more rugged than the Patna zemindari, and in the latter limestone occurs, a fact of the first importance; the plateau west of the eastern ghats is extremely poor in lime.

"The construction of a light rail or tramway would, in the opinion of those who have examined the subject, be certainly remunerative, and it appears commercially undesirable to attract the traffic of Raipur and the tracts east thereof to the port of Bombay, whilst the communications with the ports on the eastern coast (possessing so admirable a natural route, and situated at one-third of the distance from the centre of the tract) remain in a state of nature. The great respective advantage to the salt revenue is sufficient to constitute a strong argument for the grant of a guarantee, or for the construction of the line as a State line."

The collector of Nellore states that a railway from Nellore to Tripatty would be a great boon to the district. The collector of Godavari considers that a railway from Bezwada and Hyderabad would similarly greatly benefit that district.

The collector of Kistna remarks:—

"There is no railway nearer than Hyderabad on the one side and Madras on the other. The nearest point of contact is Hyderabad, 210 miles from Masulipatam, the chief town of the district, and about 110 miles from Jaggayyapet, one of the trading centres. A glance at the map of India will show the importance of continuing the railway from Hyderabad to this district. The line presents no engineering difficulties, and is crossed only by two streams of any importance, the Muniyer and the Paler. A railway from here to Hyderabad would have been of incalculable use during the recent period of distress, as supplies would have been passed into the distressed districts from this and the Godavari district by rail viâ Hyderabad, instead of taking the circuitous sea route to Madras, and thence by rail. Such a railway would, besides, be of great political and commercial importance at all times. It would greatly facilitate traffic, would stimulate trade, and should financially be a success. The sales of Government salt would be increased to the extent of not less than four or five lakhs annually."

The collector of Tanjore mentions a proposal to run a line from Nidamangalam on the South Indian line to Adirampatam on the southern coast of the district, and there is also under consideration a project for running a line from Mayaveram to Tranquebar, his Grace the Duke of Buckingham having approved it as a suitable project for a famine work, if such had been necessary. It is expected that the money required for these undertakings will, in all probability, be subscribed by the people of the district.

Regarding South Canara, Mr. Comyn says:—

"To connect Mysore and Coorg with the western coast by means of a railway from Bangalore to Mangalore viâ Mercara would be an inestimable boon no less to those provinces than to Canara; but, judg-

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ing from the climate, position, past history of Canara, the occurrence of a local famine seems to be a contingency of such extreme remoteness as to make it unnecessary for the purpose of supply of food to extend railway communication to this district, were indeed such a project financially possible. At the same time, railway communication with the west coast would be of immense advantage, as a means of protection from future famines to the provinces of Mysore which are more liable to be affected by drought.*

The collector of Malabar suggests that the Madras Railway, which terminates at Beypore, should be brought down seven miles to Calicut, which is the important trade centre of the district. He also recommends that the line now being extended to Mysore should be brought on through Wynad to the coast, and should have its terminus at Calicut. The Wynad Taluk, the seat of coffee enterprise, is very much in want of a line of rail to bring down and to take manure to the estates. The mortality in Mysore also might to some extent have been averted by such a line of rail. As it was, grain was laboriously carted up the ghaut roads to Mysore at enormous cost to the consumers.

The political aspects of the question hardly come within the scope of the present proceedings; but as they form an important factor in the consideration on which railway extension depends, the Board would passingly call attention to the extent to which these west-coast lines would facilitate speedy communication with Europe.

Effect of existing Railways upon Prices and Trade.—There can be no doubt that in the recent exceptional famine season the railways had the effect of stimulating trade and equalising prices in a most remarkable manner. Leaving out of consideration the earlier months of the famine, when there was a sudden panic, and trade had not sufficiently organised itself or adapted itself to the situation, the prices of second-sort rice at the head-quarter station of each district on the 1st August and the 1st September 1877, during which months the famine was at its height, were as follows:—

	In Seers of 80 Tolas for a Rupee.	
	1st August.	1st September.
Ganjam - -	11·6	8·1
Vizagapatam -	7·3	6·2
Godavari - -	8·0	7·4
Kistna - -	7·1	7·7
Nellore - -	5·2	6·0
Kurnool - -	4·6	5·0
Cuddapah - -	5·8	6·6
Bellary - -	5·1	6·5
Madras - -	5·8	6·6
Chingleput - -	6·0	6·8
North Arcot -	5·6	5·6
South Arcot - -	6·1	6·6
Tanjore - -	not given.	7·9
Trichinopoly -	5·6	5·8
Madura - -	6·3	6·8
Tinnevelly - -	5·7	7·5
Coimbatore -	6·3	6·3
Nilgiri - -	5·2	5·6
Salem - -	5·3	5·3
South Canara -	7·8	7·8
Malabar - -	7·1	6·7

It will be observed that in September prices ranged between five and eight seers per rupee, and that the variations in the first six districts, in which there are no railways, were generally greater than in the railway districts. The highest rate was in the district of Kurnool, which has neither rail nor sea communication, and it would undoubtedly have been much higher but for the railway in the adjoining district. The collectors of Trichinopoly, Madura, and Coimbatore all remark on the small difference in the prices prevailing in their districts and in that of Tanjore, from which they drew a great portion of their supplies. A reference to the reply to question 2 will show that a much greater diversity of prices prevailed in different districts in the earlier famines before rail and other communication.

Most collectors have confined their remarks to the obvious beneficial effects of the railways during the famine. With regard to local traffic and the equalisation of prices between different parts of the same district in ordinary years the evidence is not so clear, and it is doubtful whether the convenience of local traders is sufficiently considered in the administration of the railways. The collector of Malabar, Mr. Logan, remarks that in his opinion the encouragement hitherto given has not been what it might be, and suggests a judicious reduction in rates as regards certain classes of goods. Mr. Price, the collector of Chingleput, finds carting going on just as much as ever, and does not see much in the way of produce traffic by rail.

MYSORE.

MYSORE.

Mr. Krishnaien.

The railways have certainly equalised the prices, as can be seen from the following entries:—

Price of second-sort rice per rupee during—

	July 1877.	August 1877.
	Seers.	Seers.
Kolar - -	5·9	5·5
Madras - -	6·46	6·93
Bangalore -	5·75	5·75
Kolar road station -	6	5·87
Malur - -	5·5	5·25
Mulwagal - -	5·5	5·25
Goomnaiken-pollya	5·25	4·5
Goribednore - -	5	4·5
Gudibunda -	5·25	4·5

the three last places being the remotest from the railway stations in this district.

They have also stimulated trade to a great extent, as can be seen from the accompanying figures,* annually supplied by the officers in charge of the railway stations in this district. I am of opinion that the construction of a branch railway from Kolar Road station to Gooty viâ Chintamanypet, Ganjigunta, and Bagepully in this district, and Penakonda and Hindupoor of the Bellary district, will prove very beneficial to portions of this, Cuddappa, and Bellary districts.

*Year.	Value of Articles imported and exported.	
	Rupees.	
1871–72	5,16,248	These were favourable seasons, and the articles imported and exported were valuable ones, such as cloths, sugar, jaggery, iron, &c.
1872–73	16,16,905	
1873–74	Information not available	
1874–75	4,16,317	
1875–76	6,50,000	During these years drought prevailed and food-grains were the chief importation, the exportations being comparatively less.
1876–77	15,37,334	
1877–78	13,76,318	

CHAPTER I.—QUESTION 20.

Give an account of the water communications in the province, what kind of boats are used, what their number is, and what the nature is of the traffic they convey. State whether the navigation is capable of any improvement, and whether it is conducted in natural channels or by canals; and, if by the latter, under what regulations. What is the ordinary cost per mile of boat carriage per ton?

PUNJAB.

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PUNJAB.

River Traffic.—The Punjab rivers are navigable from the point where they leave the Himalayas. And (omitting the Jumna on the east boundary of the province, which is a tributary of the Ganges), they all unite in the stream of the Indus at the south-west corner of the province. The navigable length of each, the number of boats used for trade, the nature of traffic conveyed, and the usual charge per ton per mile is given below:—

River.	Length of navigable Course roughly estimated.	Principal Marts on each River.	No. and Size of Boats.	Nature of Traffic.	Usual Charge per Ton per Mile.
	Miles.				
Jumna -	100 miles - -	Chaprauli, Baghpat, Delhi.	200, of an average size of 370 maunds (13½ tons), each aggregate capacity 2,700 tons.	Grain and fire-wood -	9 to 12 pies.
Sutlej -	450 miles from Rúnar to junction with Chenab.	Ferozepore and Baháwalpur.	50, of about 1,500 maunds each (55 tons) aggregate capacity 2,750 tons.	Trade from Ferozepore to Sukkar (400 maunds) and Kotri (600 maunds) in grain, oil-seeds, and wool, with a small return traffic of iron and sajji (carbonate of soda).	Down stream 6 pies. Up stream 5 pies.
Beas -	40 miles from border of Kangra district to junction with Sutlej.	No river traffic worth mentioning.			
Ravi	300 miles from Kashmir border to junction with Chenab.	No river traffic worth mentioning.			
Chenab -	450 miles from Kashmir border to junction with Indus at Mithankot.	Aknur, Wazirabad, Jhang, Mooltan.	1,000 boats, varying in size, usually from 500 to 1,200 maunds (18 to 88 tons), and with an estimated aggregate tonnage of 20,500 tons.	*Down stream.* Grain and oil-seeds of all kinds, also sugar, ghee, cotton, country cloth, wood, &c. *Up stream.* Iron, dates, spices, sajji, &c., a very small return trade.	7 pies.
Jhelum -	200 miles from Kashmir border to junction with Chenáb near Jhang.	Jhelum, Pind Dádan Khan, Khusháb.	200 boats, sizes from 100 to 1,000 maunds each; average size 500 maunds (18 tons). Estimated aggregate tonnage 3,700 tons.	*Down stream.* Grain and oil-seeds - *Up stream.* From Pind Dádan Khan, salt.	4 pies.
Indus -	500 miles from Attock to Sind border; and thence 90 miles to Sukkar, or to Kotri 350 miles. [The mouth of the Indus is about 130 miles below Kotri, or some 480 miles beyond the Punjab border.]	Attock, Kálabágh, Dera Ismail Khan, Dera Ghází Khan, Mithankot, &c.	700 boats, with an estimated aggregate carrying capacity of 18,000 tons, or an average of 26 tons per boat.	*Down stream.* Grain, seeds, cotton, wool, ghee, salt, &c. *Up stream.* Dates, indigo, cotton goods, metals, &c.	8 pies.

The traffic on these rivers has been greatly diminished by the opening of railways, and will diminish still more as soon as through communication by railway from Mooltan to Karráchi has been well established. The Deputy Commissioner of Lahore writes that the traffic on the Ravi has practically ceased since the railway was opened to Mooltan in 1865. The Deputy Commissioner of Ferozepore makes a similar report concerning the Sutlej, and adds that what little boat traffic still survives on that river will probably almost disappear with the opening of the through line of railway to Karrachi.

The boats used on the Punjab rivers are flat-bottomed boats with square ends. They draw very little water, and are in this respect extremely well suited to the Punjab rivers, of which the beds are wide and shallow, the stream sluggish, and the navigable courses shift continually, owing to the rapidity with which banks of alluvial deposit are formed. The principal boat-building marts are at Attock, Jhelum, and other towns near the foot of the Himalayas; the pine and cedar of which the boats are built being cut in these mountains, and easily floated down to the towns at their base. It is a common practice on all the rivers to build a boat, freight it to Sukkar or Kotri, and there sell it.

The cause which more than any other will increasingly contribute to the decline of the boat traffic is the great difficulty of obtaining return cargoes up stream. Even floating down stream in the flood season, with few demands on the energies of the boatmen at an average rate of perhaps 25 miles a day, the boats do not carry as cheaply as the railway, and the time taken is seven days for one day by railway. But in the return journeys up stream the boats do not average 10 miles a day. Moreover, the rates of freightage charged on the return journey usually are not remunerative rates, but are accepted because at higher rates the boats would get no freight. If these circumstances are considered, it will be seen that it is impossible for such river carriage to contend successfully with railways carrying direct to Karráchi or back at 5½ pie per ton per mile.

From 1862 to 1871 the Punjab Government maintained a small flotilla of three or four light-draught steamboats and barges on the Indus between Makhad and Sukkhar, but the boats never even approximately paid their expenses. Similarly up to the present date the Sind, Punjab, and Delhi Railway have kept up a steam flotilla between the termini of their Sind and Punjab lines (Kotri and Mooltan). But they are not usually able to carry grain and seeds even down stream by this flotilla at a cheaper rate than from 8 to 12 pies per ton per mile. (This statement is based on information supplied by the Company's agent.)

It is, of course, possible that engineers may succeed in building very light-draft powerful steamers, able to work at a much cheaper rate than those yet employed.

But, speaking from the experience of the past, it is clear that on the Punjab rivers neither native boats nor steamers can even approximately compete in cheapness of carriage with the broad-guage railways.

The aggregate tonnage of the native craft on the Indus and rivers confluent with it, as above estimated, is a fraction less 45,000 tons, of which the Chenab and the Indus together supply 38,500 tons. We have no reliable data of the work done by each boat. If we assume three freights down and two freights up per annum, the total tonnage carried would be 2,25,000 tons a year. The goods traffic on the Sind, Punjab, and Delhi Railway for three years past has been :—

Year.	No. of Vehicles running.	Tons Carried.			Tons carried per Vehicle.
		Up to Mooltan.	Down to Delhi.	Total.	
1875	1,978	2,44,732	1,96,439	4,41,171	223
1876	1,938	4,20,207	2,50,633	6,70,840	346
1877	1,997	4,69,521	4,93,119	10,62,640	532

(Average size of vehicles 6-6½ tons.)

The Sind, Punjab, and Delhi Company's Indus steam flotilla* carried between Mooltan (up) and Sukkar and Kotri (down) during the same period :—

In 1875 - - 80,000 tons
„ 1876 - - - 1,35,000 „
„ 1877 - - 1,50,000 „

It is superfluous to comment on the bearing of these statistics. To a province in which the existing river carriage was only able 20 years ago to carry at the outside 3,00,000 tons a year, we have added in the interval a new flotilla carrying 1,50,000 tons, and a trunk railway carrying over a million tons a year; and this last means of traffic is as yet far from its full development, for the line from Lahore northwards is only half finished, and the extension southward from Mooltan to Karráchi, though lately finished, has yet to develop its traffic.

Canal Navigation.—The canal navigation of the province is as yet entirely undeveloped. The Sutlej, Chenab, and Indus inundation canals are not navigable, nor are they capable of being made so. The Bári Doáb Canal was designed for navigation, but experience has shown that its slope is too great; and it could not now be made properly navigable without incurring very heavy expenditure. The Western Jumna Canal is navigable from its head to Delhi,* and is used mainly for transporting fuel and timber to Delhi; the dues levied are fixed by Government under the Canal Act, and vary from nine to two pie per mile per 100 cubic feet of raft; the major portion of the traffic pays four pie. The Sirhind Canal, under construction, will be navigable from Ferozepore on the Sutlej eastwards to Patiála; and a project has been sanctioned for a navigable branch joining Patiála with the Western Jumna Canal at Karnál. The Agra Canal from Delhi to Agra (which is administered by the North-west provinces Government) is navigable, and carries a small grain traffic downwards to Agra, with a return traffic in building stone.

Cost of Boat Carriage.—The statement at the commencement of this reply, as well as the more detailed statements appended, shows that the ordinary cost of boat carriage per ton per mile by native boats on the Punjab Rivers varies from four to eight pie. On the Indus and Chenab Rivers, which carry 85 per cent. of the boats, the charge is seven and eight pie per ton per mile. The small traffic on the Delhi and Agra Canal is carried at three and four pie per ton per mile. The Sind, Punjab, and Delhi steam flotilla have charged during the past two years rates averaging per ton per mile 11½ pie for the shorter distance from Mooltan to Sukkar, and eight pie for the larger distance to Kotri. It is interesting to compare these rates with those charged for food-grains on the railway between Delhi and Mooltan, and these, as stated by the railway company's agent, are :—

——	Per Maund per Mile.	Per Ton per Mile.
	Pies.	Pies.
Ordinary rate for local booking -	0·25	6·8
Special rate for grain and seeds consigned to Sind, being taken on from Mooltan by the Company's flotilla.	0·20	5·44
Special rate charged in 1876 for grain booked through to Calcutta or Bombay.	0·18	4·89

The East Indian Railway Company are now charging at Delhi and other stations on their line for consignments of grains or seeds to Calcutta and Bombay 16·6 per 100 maunds per mile, which is 4½ pie per ton per mile. Thus, to the far superior rapidity and punctuality of railway traffic, we must also add that in the Punjab it is cheaper than the native boat traffic of the country.

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* Consisting of 11 steamers, aggregating horse-power	1,165
And registered tonnage - - - - -	2,473
Also 25 flats, with aggregate registered tonnage -	6,876
Total tonnage - -	9,349

* When the reconstruction of this canal has been completed, a total length of 127 miles will be navigable for boats, and 58 miles more for rafts.—E. WACE.

p.I. Qn. 20.

NORTH-
'ESTERN
ROVINCES
D OUDH.

Ir. Buck.

NORTH-WESTERN PROVINCES AND OUDH.

The parts which are best off in respect to water communication are the tracts which lie north of the Ganges. South of the Ganges only one river, the Jumna, is navigable, and this does not appear to be used to any very great extent. The collector of Etáwah writes :—

"Two rivers—the Jumna and Chambal—meet in this district, flowing from the north-west to south-east corners. When the railway was opened all traffic practically left them. The winding nature of the rivers, the poor country through which they pass, the shifting sandbanks, and the ravines which border them for miles render all competition with the railway impossible."

Any deficiency in water carriage by natural means south of the Ganges has, however, been more than supplied by the Ganges and Agra Canals, in the Meerut and Agra divisions.

In districts situated immediately under the Himalayas, such as Bijnor, the streams are mostly mere torrents, dry throughout the greater part of the year, and, when flowing, so rapid that any navigation is impossible. In the more eastern districts more regular streams intersect the country, flowing with steadier currents and retaining their water throughout the year; such are the Rámganga and Garra in the Sháhjahánpur district, the Gumti, the Tirhi in Gonda, the Bánganga in Basti, and the Rápti in Gorakhpur. All of these are used for the transport of grain and timber, which are floated down in the rains on boats or rafts of a size suited to the width and depth of the channel. By far the two most important rivers, from a navigation point of view, are the Ganges and the Gogra; next to them the Jumna and Gumti; then the Sárda and Rápti, together with the Rámganga and Garra, just above their confluence with the Ganges; and last, the Rámganga and Garra (higher up their courses), the Tirhi, Bánganga, and several other less important streams.

For navigation purposes the Ganges is divided into two portions by the Lower Ganges Canal dam at Narora. Above that the trade is chiefly in timber and bamboos, which are shipped on boats or rafts at wharves in the Bijnor and Sahâranpur districts, and floated down to Garhmuktesar in the Meerut, or Anúpshahr in the Bulandshahr district. Thence the timber is sent across towards Delhi or Agra by cart. In the portion of the river immediately below Narora the traffic has been diminished by the canal dam, which no boats can pass. Below Narora the first important wharf is at Farukhabad, between which town and Cawnpore there is an extensive boat trade, amounting in 1876-77 to 6,54,785 maunds. The subjoined remarks relative to the trade are extracted from the replies of the collector of Farukhabad :—

"The cargo boats in use are clumsy but strong, with a superstructure of matting sides and thatched roofs extending almost from stem to stern, the steerage being from an elevated platform, and the propulsion by broad heavy sweeps, or, when wind and opportunity offer, by a ponderous sail. In burden they range from 700 or 800 maunds to 50 maunds. The whole cargo is, in such boats, well covered in. They convey food-grains of all kinds, indigo seed, cotton, linseed, aniseed, poppy-seed, mustard-seed, coriander and caraway-seed, to Cawnpore, Mirzapur, and Allahabad; and the chief season for the departure from Farukhabad of these large cargo boats is in April, May, and June, but large numbers also go down in the rains. The cost per 100 miles of boat carriage for one maund is one anna and four pie. At this rate the cost per ton would be Rs. 2-5-4 for a hundred miles, or 4½ pies per mile.

"The smaller cargo-boats are called 'palwar,' and the larger are called 'katri.' There are 12 of the former and 90 of the latter at ferries and bridges of boats in the district from Surajpur ghát to Mehndi ghát, stationary more or less. And of boats plying up and down, there are 76 large and two small belonging to this district. The navigation on the Ganges is not susceptible, that I can see, of any improvement. The river from time to time alters its course so very much that the site of a heavy sandbank one year may be in the fairway of a channel the next. Every year, on both banks, some lands are submerged, and some again are thrown up by fluvial action.

"Boats must pick their way as they best can, and in the rains, at all events, they do not often go seriously aground."

Eastward of Farukhabad there is a gradual increase in the navigation on the Ganges. There are wharves of importance at Cawnpore and Allahabad. In the year ending March 31st 1877 the total weight of goods embarked and disembarked at the Cawnpore wharf amounted to 7,20,247 maunds, of which 6,54,785 maunds passed between it and wharves up stream, and 65,462 maunds between it and down-stream wharves. Mirzapur used at one time to be one of the chief centres of Upper India, and then river streamers with flats used to ply regularly between it and Calcutta, but the completion of the East Indian Railway in 1863 was a severe blow to its prosperity, and for six years no river steamer has visited it. Formerly Mirzapur was the mart in which the produce of Upper India was collected for export to Calcutta, and this was naturally assisted by the facility for transport afforded by the Ganges. There are about 117 boats at Mirzapur of the kind called katras and patailas, the former with flat and the latter with round bottoms; these average from 200 to 1,000 maunds in burden.

The Ganges channel is constantly shifting, and navigation is tedious and difficult; most of the traffic runs down stream, the boats being often returned empty to the wharf of consignment. Below is compared the up-stream and down-stream traffic which came to or left the Cawnpore wharf in the year ending March 31st 1877.

Trade between Cawnpore and wharves:

Above Cawnpore.	
Down stream to Cawnpore -	6,54,785
Up stream from Cawnpore -	27,143
Below Cawnpore.	
Down stream from Cawnpore -	63,037
Ups tream to Cawnpore - -	2,425

It will be noticed that the trade in the portion above Cawnpore is far larger than that below it. This is due to there being no railway between Cawnpore and Farukhabad, while there is one between Cawnpore and the chief marts below it.

Boat traffic on the Gogra is perhaps even more important than on the Ganges. In the year 1877-8, the total weight of goods which passed up and down at Darauli, on the frontier of these provinces, amounted to 43,36,741 maunds. These chiefly consisted of grain, sugar, and oil-seeds collected from the districts through which the Gogra passes on its way down from the hills. Commencing with the Bahraich and Kheri districts, the chief wharf is at Khairi, whence large quantities of grain are carried in the rains down to the Gorakhpur and Azamgarh districts and Chapra. Below Khairi is Bahramghat, where much of the timber is disembarked which is floated down the Koriáli from the Nepalese hills, the Koriáli being the name given to the Gogra where it first leaves the hills. The Gogra is also fed here by trade which comes down the Chauka or Sárda, though it would appear to no very great extent. Opposite the town of Fyzabad there is the Nawábganj wharf, where it is believed that the greater part of the Gogra trade centres. Grain and oil-seeds from Gondal, Bahraich, and Basti are collected here for shipment. The Tirhi, which meets the Gogra near Nawábganj, CHAP.I. Q

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is used for navigation in the rains, and acts to some extent as a feeder to it. Below Nawábganj there are several small wharves in the Fyzabad, Gorakhpur, and Azamgarh districts, at which the chief trade done is in the export of sugar. The Rápti flows into the Gogra close to the town of Barhaj, in the Gorakhpur district. It is navigable, like the Gogra, all the year round, and is used for the carriage of timber and grain through the Gonda, Basti, and Gorakhpur districts. A certain amount of timber is received by it from its tributary the Kunra.

The boats used on the Gogra are very large as a rule, having a capacity of from 500 to 1,500 maunds. Those employed on the Rápti are lighter and do not exceed 300 maunds. The number of boats which annually pass Nawábganj (including those from the Tirhi) is estimated at 1,500. Of these 200 are classed as capable of carrying 1,500 maunds, 800 capable of carrying 700 maunds, and 500 with a capacity of 500 maunds. The numbers plying on the Rápti is estimated at 152, of which 15 can carry 300 maunds; 42, 200 maunds; and 95, 100 maunds.

As mentioned before, navigation on the Jumna has much diminished since the East Indian Railway has connected the towns of Agra and Delhi with down-country marts and the port of Calcutta. Above Delhi the Jumna abounds in dangerous shoals, and is not, properly speaking, navigable for boats. The completion of the railway has withdrawn most of the traffic from the portion between Delhi and Agra (inclusive), and it is not till the border of the Jalaun district that its trade becomes anything at all considerable. Between this point and Allahabad there are three or four wharves situated on the southern bank, the most important of which are Rájapur and Mau, in the Bánda district. In the year 1877 the exports from Rájapur by the Jumna amounted to 2,56,569 maunds, while the imports were 1,25,544 maunds. The trade of Mau is less than that of Rájapur, which is the principal depôt for the grain and cotton of the Bánda district.

The following remarks are taken from the Bánda Famine replies:—

"There are seven boats of the ordinary kind used for traffic in Mau, capable of conveying 1,650 maunds of merchandise, and 12 of the same kind in Rájapur capable of conveying from five to 6,000 maunds of merchandise. The traffic which is conveyed by them consists chiefly of grain, cotton, and wood."

"The traffic is chiefly from and to Allahabad, Fatehpur, Cawnpore, Mirzapur, Benares, and Patna. The average cost per mile per ton varies as to the place to or from which merchandise is conveyed."

The following are two examples of the freights from Rájapur per 100 bags of 2 to 2½ maunds each (about 8 tons):—

			Amount.	Per Ton per Mile.
Allahabad	-	53 miles	Rs. 6 0 0	nearly 3 pies
Mirzapúr	-	105 „	Rs. 24 0 0	5 „

and from Mau to the under-mentioned places for the same quantity of goods:—

			Amount.	Per Ton per Mile.
Allahabad	-	28 miles.	Rs. 6	5 pies
Mirzapur	-	60 „	Rs. 8	3 „
Benares	-	84 „	Rs. 10	5 „

Next in importance after the Jumna comes the Gumti, which, rising in the Tarái at the foot of Kumaun, flows past Lucknow down the Gogra-Ganges Doab, and falls into the Ganges near Ghápur. The river Sái meets the Gumti near Jaunpur, having followed much the same course, but not being navigable. The Gumti is navigable as far up as the Hardoi district; but since the opening of the East Indian Railway it carries little or no trade to or from that district, as the railway directly competes with it. It is not till below Lucknow that it is much used for carrying purposes, where it is needed for the conveyance of the grain of the Sultanpur and Partabgarh districts to the mart of Jaunpur. At Jaunpur the grain either takes the railway or passes on in boats down to the Ganges. The boats used in the Sultanpur district are "dongas" or dug-outs, and barges varying in draught from 100 maunds to 300 maunds. The former are used to carry down timber and firewood, and generally come from the districts west of Sultanpur (Hardoi and Sitapur). There are about 100 in the district of Sultanpur itself. The larger boats are for the conveyance of grain and oil-seeds, and they come up from Patna and Jaunpur, going on westwards for grain and oil-seeds wherever they can be found and obtained. The chief drawback to navigation on the Gumti is the extremely winding course its channel follows. This peculiarity, in which it resembles the Rápti, greatly increases the difficulty of navigation as well as enormously adding to the length of the journey.

Other navigable streams which flow through the Hardoi district are the Rámganga and the Garra: both are chiefly used for the carriage of timber and wood down to the Ganges near Farukhabad. Both these streams are only navigable in the rains for anything more than boats of two or three tons. The Rámganga above Budaun is only used for floating down rough rafts of timber from the forests at the foot of the hills. In the Hardoi district, near the point of confluence with the Ganges, both Rámganga and Garra have deeper streams, and are used for the carriage of boats between that district and Cawnpore or Allahabad. These boats vary from 500 to 250 maunds in draught, and usually carry down freights of grain, firewood, and grass. In the Hardoi district there are 16 such boats on the Rámganga and four on the Garra. For boats of this size both rivers are navigable all the year round, and can take boats of 500 maunds' capacity when swelled by the rains.

Besides the rivers and streams above mentioned, there are many others which are used in the rains to float down jungle produce from the foot of the hills. There are four such streams in the Hardoi district, which act as feeders to the Gumti, Garra, and Rámganga and others in the Basti and Gorakhpur districts, such as the Bánganga and Kunra (or Dhamela).

The only rivers in the provinces which are navigable all the year round are the Gogra and Ganges, throughout their length; the Jumna, below Delhi; the Gumti, below Sitapur; the Rápti, below Basti; and the Rámganga and Gharra, a short distance up above their confluence with the Ganges.

As regards the cost of carriage by river, it may be stated that, as with cart carriage, the freights are not so much calculated on a mileage rate as fixed fares from one wharf to another, which, though undoubtedly primarily regulated by the distance, appear in many cases to have been much modified by other causes, such as custom. The rates given by district officers are evidently obtained by dividing some of these customary fares by the number of miles which lay between the wharves of despatch and consignment.

For the Ganges,	4½	pies per mile per ton is given as ruling in	Farukhabad.
„	Gogra,	3¾	pies	Gonda.
„	Jumna,	3 to 5	„	Bànda.
„	Gumti,	6	„	Lucknow.
„	Garra and Rámganga.	4¾	„	Hardoi.

But to these must be added cost of insurance and some extra expenses, which will considerably increase the rate per mile. Some 90 per cent. of the cargoes which pass up or down the Ganges are insured by the owners against theft, fire, or wreck. The insurance is effected by men called bimawallas (bima=insurance), and is often at the rate of 1½ per cent. on the value. The "bimawalla" puts one or two servants of his own in charge of the cargo to ensure fair play, and these are paid at the expense of the insurer. These

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extra expenses will be often found to add as much as one-fourth more to the cost per ton per mile, raising it from four pies to five pies, or even more than this. The rate per ton per mile for grain on the East Indian Railway is $5\frac{3}{5}$ pies, and the quickness of delivery by rail, and the certainty in the time of arrival, appear to more than compensate for the excess.

The rivers and streams used for navigation in these provinces have now all been noticed. The canals remain. Excluding the small irrigation canals of the Dún, Rohilkhand, and Bundelkhand, the chief canals are four,—the Upper Ganges, the Lower Ganges, the Eastern Jumna, and the Agra. All these more or less follow the course of the Ganges and Jumna Rivers, from which they are fed. The first three lie in the Ganges-Jumna Doab, while the fourth runs between Delhi and Agra, a short distance south of the Jumna and almost parallel with it. The Upper Ganges Canal runs from Hardwár, where it receives the water of the Ganges, to Cawnpore, where it pours its surplus back into the same river. It has two branches or off-shoots, one which leaves it in the Muzaffarnagar district and runs towards Farukhabad, and another which leaves it in the Aligahr district and runs through Etáwah down to the Jumna. Of all the canals only the Agra and the Upper Ganges are used for navigation, and of the latter only the main line between Hardwár and Cawnpore.

Traffic on the Upper Ganges Canal is carried on in boats or barges belonging to private individuals, but taxed by the Canal Department. The following note has been furnished from the office of the traffic manager, Ganges Canal:—

"The pattern of boat commonly in use by native traders on the Ganges Canal is a flat-bottomed wooden vessel, with an average carrying capacity of about 750 maunds each (=about $27\frac{1}{2}$ tons). All cargoes are carried above the gunwale, and are consequently exposed to the weather at all seasons of the year. There are at date 263 merchants' or private boats plying on the canal, and besides these there are 13 iron barges belonging to the Canal Department, and 20 iron and wooden boats employed by divisional officers, making a total of 296 in all. Boats are divided into three classes, and each class pays a different rate of toll. Class A. includes all boats over 10-feet beam, and these pay a toll of Rs. 20 a quarter. Class B. includes all boats between 6′ and 10′ beam, and pay a toll of Rs. 16 a quarter. Class C. all under 6′ beam, and pay Rs. 8 a quarter. Tolls may be paid in advance, or at any time during the quarter, and when payment is made the boat owner receives a printed receipt showing the date of payment, owner's name, boatman in charge, number of boat, and amount paid. Once every quarter the traffic manager goes over the whole canal, takes up receipts, and issues printed rawannas in their stead; in this is entered the owner's name, number of boat, and date up to which payment of the tolls has been made. The amount entered in the rawannas must agree with the collection paid into the Government treasuries at the different stations, and the whole must tally with the number of boats shown in the boat register book. The register is kept by the traffic manager, and is checked by the whole number of boats found on the canal when rawannas are issued.

"Great improvements as regards navigation have been made in the canal of late years, but much still remains to be done to make the stream a thoroughly reliable means of transport. The weekly closure of the Cawnpore branch, and the uncertainty of water supply during periods of minimum irrigation, are the two chief obstructions to navigation at present; when these are removed, and traders can calculate with tolerable certainty upon free navigation at all seasons of the year, it is believed that a better class of boats will be put upon the canal, and that the revenue from tolls will form a very considerable item in canal receipts, and besides this, what is of far more importance, is the facility which will be afforded to cultivators in canal districts for getting their produce to a market at a reasonable charge for carriage."

The traffic on this canal was registered at the Cawnpore end under the Department of Agriculture and Commerce in the year 1876–77. The total weight of the traffic which passed the registration post here was 12,55,151 maunds.

The trade chiefly consists in grain which is brought down to Cawnpore from wharves in the districts of the Agra and Meerut divisions. The total amount of trade which passed up and down the canal in the year 1877–78 was 1,415,250 maunds.

The freights are not regulated by the canal authorities, but boat owners are allowed to make their own arrangements, so it is difficult to arrive at any very correct estimate of the cost of water carriage to the public; but taking the average cost of carriage in the canal department, the rate would be for long distances about 2·25 pies per ton per mile, and for short distances 2·5. The collector of Mainpuri puts the rate so high as 3·5 pies per ton per mile.

The following remarks as to the navigation on the Agra Canal are taken from the Navigation Report for the year ending 31st March 1878.

There are on the canal 72 boats belonging to private persons, which can carry on an average 400 maunds a-piece. There are also 20 boats belonging to the canal authorities. The total amount of traffic carried along the canal in the year was 104,706 maunds, of which 28,609 maunds went up and 76,097 maunds went down. This is very small, considering that the canal passes by the three large towns of Agra, Muttra, and Delhi, with the two former of which it is connected by still-water navigation channels of considerable length. The down-traffic is chiefly in grain and sugar, both of which come from Delhi, where they are collected from the districts of the Meerut division. The most noticeable item in the up-traffic is sandstone from the quarries of Sikandra, near Agra. Besides the boat traffic, some 1,61,582 cubic feet of sleepers were floated down in rafts; these were supplied by the Forest Department to the Gwalior State Railway.

A toll of Rs. 20 per quarter is levied on all private boats, giving an income of Rs. 1,424. Rs. 3,933 more were realised from the tolls on rafts.

The canal has been open for navigation for comparatively speaking a short time, and the freights do not yet appear to have settled themselves. When the canal was first opened, and there was but little competition of cargoes, as much as Rs. 18 were paid for the conveyance of 100 maunds (about $3\frac{1}{2}$ tons) up stream from Sikandra (near Agra) to Delhi, and Rs. 17 down stream from Delhi to Sikandra. The effect of gradually increasing competition amongst boat owners was to reduce these freights, till the following figures were reached, apparently the minimum rates at which it will pay owners under existing tolls to carry goods between Delhi and Sikandra:—

Down stream, Rs. 6 per 100 maunds ($=3\frac{1}{2}$ tons)= $3\frac{1}{7}$ pies per ton per mile.

Up stream, Rs. 10 per 100 maunds ($=3\frac{1}{2}$ tons)= $5\frac{2}{7}$ pies per ton per mile.

As regards the profit which the canal may be expected to make from navigation, independently of the irrigation for which it was primarily intended, the following remarks of H. M. King, Esq., Executive Engineer, in charge of navigation, Agra Canal, may be quoted:—

"*I think it has been conclusively shown in one of the printed papers connected with the revised estimates of the scheme, that the net revenue from navigation can never pay the interest on the capital expended in making the Agra Canal navigable* * * * * * * *I am convinced that the most satisfactory and certain way of increasing this revenue would be to exclude all private boats from the canal, and to extend our own boating operations.*"

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Note on Canal Navigation by MAJOR C. C. SCOTT-MONCRIEFF, R.E., C.S.I.

1. The reasons why the Ganges Canal is not more used for traffic are chiefly as follows :—

1. To meet the requirements of irrigation, it has not been carried past any large towns or markets. Roorkee and Cawnpore are the only two towns situated on it, and the former has no commercial importance.

2. It forms an unconnected link of navigation. The river below Cawnpore is with difficulty navigable at all except during the rains, and, practically speaking, all the down-country traffic here takes the railway.

3. The velocity of the stream is so great that up-stream traffic can only be effected with difficulty and very slowly.

4. The Cawnpore branch of the canal, 180 miles long from the Aligarh district downwards, is closed every alternate week.

5. Until the year 1873 much inconvenience was caused by the want of headway under the bridges; and until April 1877 a series of accidents necessitated the closure of one lock after another, and the consequent interruption of traffic. Both these obstacles are now satisfactorily removed.

2. To remedy the first drawback—the distance from towns—projects have been prepared for taking branch canals into Meerut (8 miles), into Khurja (2½ miles), and into Aligargh (9 miles), but hitherto want of funds has prevented their execution.

3. For a similar reason the removal of the second obstacle mentioned above has been deferred. It has been proposed—

(*a*.) to connect the canal with the Khatauli Railway station, district Muzaffarnagar, a distance of less than two miles ;

(*b*.) to connect the canal near Murádnagar with Delhi and the Agra Canal, a most important link by which large traffic might be confidently expected from the interchange of the sugar and wheat of the North-western Provinces with the cotton and salt of Rajputana and the country west of the Jumna; the connection of Delhi and Cawnpore, too, would be of value;

(*c*.) to prolong the Ganges Canal past Cawnpore to a point in the Ganges or Jumna up to which there is free navigation throughout the year, thus affording a free outlet to the grain which is in a chronic state of block at the Cawnpore Railway station.

4. The velocity of the stream in the Ganges Canal has been considerably lessened during the last few years by the interpolation of weirs and locks, and it is not probable that much more can be done in this direction. Although it is a great obstacle to up-stream traffic, it is a great help to all that goes down stream, since the boats are floated down entirely by the current; and as the down-stream traffic would probably in any case greatly exceed the up-stream, the inconvenience is not so great as might be supposed. Nor is the fourth obstacle I have mentioned. The closure of the Cawnpore branch is so well known that the boatmen know how to time their trips accordingly; and as the channel at the lower end is rarely without some water in it, boats can ply a considerable distance even in the closed weeks. The completion of the Lower Ganges Canal, now not far off, will make this branch to be run constantly.

5. Local traffic between intermediate points on the Ganges Canal is almost unknown. With the view of encouraging it, a lower rate of tollage was fixed in 1877 for smaller boats, but none have begun to ply.

6. Probably for this reason there has never been any navigation on the Etawah branch of the canal, which was originally intended for traffic as much as the Cawnpore. A costly flight of locks into the Jumna, a few miles above Hamirpur, was half-built, and abruptly stopped by the Mutiny in 1857, never to be renewed. In other respects the Etawah branch was just as fitted for navigation as the Cawnpore until the bridges in the latter were raised, but not a single boat has ever plied on it.

7. The navigation of the Agra Canal has none of the drawbacks which that of the Ganges Canal has. The velocity of the stream is very low; ample headway has been given to the bridges; branch lines have been carried into the cities of Agra and Muttra, while the Punjab Government are now connecting it with Delhi. Navigation has here, then, got every chance. The canal has only been recently opened throughout its length, and a large boat traffic may reasonably be expected on it.

8. Until the Ganges Canal is linked on to Delhi, and either by its prolongation beyond Cawnpore or by increased railway power the goods are prevented from sticking there as they now do, I do not think it would be judicious to raise the tolls higher than they now are. In 1877–78 I find the ton-mileage on the Ganges Canal was 9,500,225, and the State charge Rs. 20,227, that is, ·409 pie per ton per mile. Colonel Brownlow calculated the State charges on the Godavari in 1876–77 to be ⅔ pie per ton per mile; and he says that on the Erie Canal it is nearly 1¾ pies per ton per mile, and on the French canals ¾ pie for first-class and ⅓ pie for second-class goods. The Bengal Government, with their present policy, would, I have no doubt, quadruple our charges right off; and I cannot say for certain that this would reduce the number of boats very much, but I think it would to some extent. And really, I think, we must give up the idea of making navigation directly profitable anywhere, and rather study how the general welfare may be benefited by it. On the Agra Canal, too, I should oppose raising navigation rates, at least until the traffic has become developed.

9. At one time I was very hot on a Government boat train, but after my experiences on the Deltas and in Orissa I am not. If navigation were hanging back on a new canal, I think it would be an excellent plan to introduce it by a fleet of Government boats, but I would sell them as soon as the traffic had fairly sprung into life. With a Government train there is the danger of choking off private traders. There would be a difficulty in suddenly expanding to meet the wants of a year of drought. And, in short, I think the *onus probandi* lies with those who would propose that Government should be carriers, and my opinion is that the present system could not thereby be improved. There are regular native agencies who work with simple and inexpensive apparatus, and I think they are better suited to the people than anything we can substitute.

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Water Communications.—No other part of India possesses such magnificent water communication as Bengal Proper. It may be said to be its distinguishing physical characteristic. The Ganges flowing from the north-west, and the Brahmaputra from the north-east, meet, and flow to the sea through the great rice-growing delta of the province. They are navigable throughout the year, and almost all the

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other rivers of Bengal are feeders of or distributaries of these two main lines of communication, as a glance at the accompanying map will show. Numerous inlets and outlets permeate nearly all the districts of the country.

The following description of the great trade routes of Bengal, which are chiefly water routes, is taken from Mr. Cotton's "Report on the Internal Trade of Bengal" for 1876–77:—

Trade Routes of Behar.—From the three frontier northern sub-divisions of North-Behar there are two great currents of export trade, the one making south-west and the other south-east towards the Ganges. Of the former the staple is rice. The routes followed by this trade are overland, crossing the courses of the numerous rivers which flow through the country. This trade is entirely restricted to the dry months of the year; it commences in December and it ceases in May, herein naturally following the condition of the weather and the seasons of harvesting. The trade loses volume as it proceeds, for it largely supplies the Tajpur and Hajipur sub-divisions of Tirhut and the Beguserai sub-division of Monghyr, regions which are more profitably devoted to non-food staples and to rubbee crops than to rice. For the most part this traffic is not river-borne.

The second current of export trade from Behar tends southwards in the first instance to the Ganges, or to the marts situated on the larger affluents of the Ganges, and then it sets south-east to Calcutta. This trade is chiefly in oil-seeds, and it is to a large extent river-borne. The other articles of export trade find their way along this route to Calcutta, with the exception of tobacco, which is exported to Patna, the North-Western Provinces, Central provinces, &c.

Generally speaking, it must be said that the rivers of Behar, other than the Ganges, are ill suited for navigation. They are rarely navigable except during the rainy season, and at that period are not unfrequently rapid and dangerous. In consequence, the greater part of the trade of Behar is carried overland along the roads with which the province is now so well provided, and the river-borne export trade is brisk only during the months of July, August, September, and October, when the rivers are full of water.

Trade Routes of Northern Bengal.—From North Behar it is an easy transition to the tract of country technically known as Northern Bengal, which comprises all the districts of the Rajshahai and Cooch Behar division. This tract of country may be roughly described as extending from the Mohananda on the west to the Brahmaptura on the east, and from the Tista on the north-east to the Ganges on the south-west, comprising a portion of the districts of Purnia and Jalpaigori and the whole of the districts of Rangpur, Dinajpur, Bogra, Rajshahai, Pabna, and Malda.

The Mohananda and the Tista take their rise in the Darjiling hills in close proximity with each other at the north-western corner of this tract of country; and taking the Mohananda as the western boundary, and the Brahmaputra as the eastern boundary, it may be said that the general flow of all the Northern Bengal rivers south of the Tista is from north to south. Some flow to the south-west, and eventually empty themselves in the Mohananda, while the rest meander away to the south, and become merged in the Chullun bheel, whence in the rains they afford easy communication with the Ganges or Brahmaputra.

The line between these two sets of rivers is distinctly marked. The Purnabhaba, on which river the town of Dinajpur is situated, runs into the Mohananda, and all rivers to the west of the Purnabhaba do the same; while the Atraie, and all rivers to the east of it, flow into the Challan bhiel or the Brahmaputra. The space, therefore, between the Purnabhaba and the Atrai is the watershed of the whole country. The produce sent along the Purnabhaba and the rivers to the west is exported up country; the produce of the Atrai and of the rivers to the east finds its way to Calcutta.

These rivers are traffic routes for three or four months of the year during which the rains last. During the remaining eight or nine months of the year there is not sufficient water in them to afford an outlet for the products of the country, and consequently all goods must be carted to some point where there is direct water communication with the Ganges or Brahmaputra, or must remain where they were produced until the rivers open at the end of June. The rivers Jabuna, Nagor, Gur, and Baraloi, all in the southern districts, are navigable by moderate-sized craft for a longer period than others.

The staple productions of the country are rice, jute, and tobacco. The greater part of the rice crop is not harvested till January, by which time the rivers are dry; and as rice is so cheap that it will not stand the expense of any lengthened land carriage, it remains mostly stored up in the district for months, until the rivers begin to open again, when it is sent off in great quantities. Jute also is a crop that does not fit in with the rise and fall of the rivers. It is a crop which is grown in the rains, and which is only coming to hand when the rivers are beginning to fall, so that only the very early samples of the new crop get down that season, unless it is grown in the immediate vicinity of a river open all the year round. Tobacco, on the other hand, comes in in April, and has therefore only to be kept for a couple of months before it is in the market, if the cultivators and dealers choose to come to terms as to the price. The cultivation of tobacco, however, is local and limited, and, as a rule, it may be fairly said that for some eight months of the year there is no natural outlet for the main productions of the country. The plan usually adopted by those engaged in trade is, therefore, to settle down on the banks of one of the rivers, and then accumulate, through the agency of paikars or by purchasing on their own account, the goods which they intend to send down country. Thus on the Atrai there are to be found, at distances varying from five to 10 miles, marts doing a larger or smaller trade which are depôts for the receipt of the produce of all the surrounding country, and the same is the case in a greater or less degree with all the rivers in this part of Bengal As long as the rains go on, and the rivers keep full, the process is easy enough, as the largest boats can then go up the Atrai quite easily; but at the end of October, when the rivers begin to fall, a great change occurs, and articles for export have to be carted over very bad roads, often over none at all, till they reach some place where water communication with the Ganges is available for boats of some size. But as the season goes on the size of the boats diminishes even at those places where there is most water, and rafts and dinghees of the lightest construction have to be brought into play. It may be expected that the opening of the Northern Bengal Railway will afford a very advantageous opportunity for the ready transit of produce, and so relieve the block which at presents sadly impedes the commerce of the country during the greater part of the year.

Trade Routes of Central Bengal.—The Nuddea rivers is a general name for the extensive network of affluent and effluent streams of which the Bhagirathi, the Jallinghi, and the Matabhanga are the principal channels.

The loop-line of the East Indian Railway is in a great measure in direct competition with the Bhagirathi River route, and doubtless the railway has been the principal cause of the large reduction of the river traffic. The Bhagirathi now only carries 40 lakhs of maunds in the year, whereas formerly it carried 100 lakhs, and in one year, 1842–43, the registered traffic amounted to 120 lakhs. The whole of the cotton, the whole of the indigo, and more than half the saltpetre and sugar, as well as a large proportion of other staples, have been attracted from the river by the railway. But with every allowance

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Bengal.

Mr. Toynbee

made, it would seem that the river has deteriorated as regards navigation. Even now a considerable quantity of traffic, amounting to about two lakhs of maunds in the year, comes into Calcutta from Behar by the Calcutta canals. The ordinary channel for Behar produce is along the Bhagirathi River; but during the dry season the up-country merchants, if they export at all, are now compelled to avoid the Bhagiruthee and to send their boats the long route down the Ganges as far as Kashtea, along the Gorai, the Modhamatty, and Atharabanka, and so by Khulna into the canal routes.

Similarly, the Eastern Bengal Railway is in direct competition with the Matabhanga, and, to a less degree, with the Jallinghi River route; and as regards the local trade of the district of Nuddea, and, to a smaller extent, as regards the trade of the neighbouring districts of Rajshahai and Pabna, it has certainly succeeded in diverting a large part of the traffic. But merchandise of which the bulk is considerable, such as food-grains, oil-seeds, and salt, still ordinarily adheres to the old route. The railway carries nearly the whole of the cotton piece-goods, indigo, chillies, turmeric, and sugar. The jute carried by the railway has also reduced the Nadiya River traffic, although the bulk of the river-borne jute is not carried along these rivers, but comes from North-eastern and Eastern Bengal along the Sunderbuns route into Calcutta. The traffic of Northern and Central Bengal is carried by the Jallinghi and Matabhanga.

Trade Routes of the Delta.—It is impossible to give in this place a systematic account of the great river system of the districts of Jessore, Faridpur, and Backergunge. The interlacings of the rivers are so complicated, and the swamps in which the channels lose themselves or merge with other streams so perplexing, that the thread of the narrative must be constantly interrupted, and it could only be made intelligible to the reader by frequent reference to a map on a large scale.

Trade Routes of Eastern Bengal.—The whole of Eastern Bengal is a network of river communications which afford unrivalled facilities for the carriage of merchandise. The largest rivers are the Jamuna and Megna, both off-shoots from the Brahmaputra. The Megna is formed from the confluence of the Surma and Brahmaputra.

Trade Routes of Western Bengal.—On the western side of the Gangetic delta the rivers have little or no connection with the main system of the country. The Damudar, the Rupnarain, and the Kasai may all be said to join the Hooghly between Calcutta and Saugor Island; but they are isolated rivers which have sprung from the plateau of Chota Nagpore, do not help to form the delta, and are independent in character. They are very unfavourable for navigation, being shallow in the cold weather and violent during the rains. They carry but little trade, and the surplus produce of Western Bengal, so far as it is not tapped by the Hooghly River, is borne away by the roads and the East Indian Railway to Calcutta.

The trade of the Midnapore district is greatly facilitated by the two canals which run through the district, viz., (1) the Hidgellee Canal, 32 miles of which are open, leading from Geokhally at the junction of the Roopnarain and Hooghly to the Rasulpore River, and (2) the high-level canal. Besides the Hidgellee, or low-level canal, there is an alternative route called the Bahirgang, which follows the course of the tidal estuaries as far as the junction of the Hooghly and Rasulpore, and thence proceeds up the Hooghly. This route is exposed and dangerous during the stormy months of the year; but, on the other hand, being entirely tidal, it admits of being traversed in one ebb and two floods with hardly any labour or exertion, and without the payment of toll. Hence the bulk of the traffic only goes up the canal in March, April, May, and October, when bad weather may be apprehended, but in the other months only the more valuable cargoes use it. The high-level canal does for the north, centre, and west of the district fully as much as the low-level canal does for Hidgellee and North Balasor, with the difference that, except for the last two reaches there is no "Bahirgang" to compete with the canal for the bulkier cargoes.

Trade Routes of Orissa.—The three great Orissa rivers, the Subarnrekha, the Baitarni, and the Mahanadi, have a direction generally parallel to one another and a south-easterly course, the two former rising in Chota Nagpore and the latter in the Central provinces. The rising ports of Chandballee and Mourigong are about 25 miles inland, on the banks of the Baitarni River. The two places are nearly opposite to one another, Chandballee being to the north in the Balasore district, and Mourigong to the south in Cuttack. The Mahanadi is navigable for boats for 460 out of its 520 miles, and near Cuttack is about two miles in breadth during the rains. The trade of Orissa is, however, far more even than in the case of Midnapur dependent upon its canals than upon its rivers.

These canal routes may be described separately. Beginning with the northern part of the province, we have the Sone canals connecting the upper reaches of the Sone with the Ganges by two branches—the one passing through the Shahabad district and locking into the Ganges near Arrah, the other through the Patna and Gya districts into the Ganges near Patna. On both these canals the traffic is as yet in its infancy, but may be expected to develop to a very large extent.

The Calcutta circular canals afford communication for an innumerable fleet of small country boats with the creeks and rivers running into the Sunderbuns. The Midnapur canals have been described above.

In Orissa, Cuttack, the capital of the province, is connected by canal with its chief port, False Point. Chandbally, another port, is also now placed in direct water communication with Cuttack, and the completion of a contemplated low-level canal to Midnapur by Balasore, which would probably not cost more than 30 lakhs of rupees and would yield a fair profit on outlay, would place Cuttack within reach of Calcutta by inland water communication.

The boats chiefly employed on the water routes above described are the ordinary kind of country boats which have been in use for centuries. In carrying tea and valuable products river steamers are employed, but to a comparatively small extent, as the table given in the answer to question 17 will indicate.

It is quite impossible to give the number of boats employed. The general rate for boat carriage throughout Bengal is three pie per ton per mile, exclusive of tolls.

The navigation of the various small creeks and inlets which permeate in all directions is doubtless susceptible of improvement, especially in Eastern Bengal. The Road Cess Act provides for such improvements, and they are being gradually carried out from road cess funds.

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There are no canals in these provinces. The boat service at the ferries, lying on the principal traffic routes, may be said to be adequate. Except at the ferries and for the rafting of timber, practically speaking, water communication is limited to a part of the Weinganga, from 10 miles from the head-quarters

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of the Balaghat district to Bhandara, and thence downwards through the Chanda rice-field, with occasional interruptions to Sironcha, and again from Seorinarain on the Mahanadi to Cuttack. I am not prepared to say that positively no improvements to the navigation could be affected at a reasonable expense, but it is believed that nothing of much importance in this way could be undertaken with any hopes of an adequate return for the capital which would be required.

The Deputy Commissioner of Sambalpur gives the following account of the Mahanadi boat traffic:—

> "There is water communication by the Mahanadi up the river to Seorinarain and down the river to Cuttack. The boats used are rather narrow with flat bottoms, and their dimensions, &c. are—
>
> Length - - 30 to 80 feet.
> Breadth - - 3 to 7 feet.
> Capacity - - 30 to 250 maunds.
> Crew - - 4 to 13 men.
>
> "As to how many boats of each class are available, the following figures were put before me last year, when a report was being drawn up for the Quarter-master General's Department. I cannot answer for its absolute correctness, and am now having a fresh inquiry made, the result of which will be reported if desired—

Name of Class.		Divisions.	Load, Maunds.	Crew.	Hire per Mensem.	Number available.
3	pahal	60×2	30	3	Rs. 22	70
$3\frac{1}{2}$	„	60×3	35	4	„ 30	57
4	„	$61 \times 3\frac{1}{2}$	50	5	„ 36	75
$4\frac{1}{2}$	„	62×4	80	6	„ 48	60
5	„	$67 \times 4\frac{1}{2}$	120	7	„ 58	52
$5\frac{1}{2}$	„	$70 \times 4\frac{3}{4}$	150	8	„ 68	30
6	„	$75\frac{1}{2} \times 5\frac{1}{4}$	180	9	„ 76	12
$6\frac{1}{2}$	„	$77 \times 5\frac{3}{4}$	225	10	„ 84	3
7	„	80×6	250	13	„ 100	1
		Total number of boats available			-	360

"Since the above return was submitted I have heard that the number is much larger, and the most careful inquiries will now be made, but this will take time. The boats are usually employed in bringing up salt, piece-goods, brass work, cocoanuts, &c. from Cuttack for this and the Bilaspur district, and taking down to Cuttack grain, wheat, oil-seeds, myrabolans, lac, &c.

"The smallest boats can ply all the year round, the largest only for six months, viz., during the rains and early part of the cold weather.

* * * *

The cost of carriage per ton per mile, at the rates now prevailing, is $2\frac{3}{4}$ annas."

For Balaghat, I would refer to page 54, where Major Bloomfield mentions the traffic in the rains. The present Deputy Commissioner writes:

> "There is water communication during the rainy season on the Weinganga from Chizgaon, 10 miles from the Sadar station, down the river. About 50 canoes are employed, of which only 15 belong to this district; the rest come from the Bhandara district. The traffic is in gram, rice, wheat, urad, tur, &c.
>
> "I do not personally know, but am informed that the navigation during the rains between Chizgaon and Bhandara is easy, and that the rocks are then covered. * * The cost of boat hire per ton per mile is about one anna."

The Deputy Commissioner of Bhandara writes:—

> "The Weinganga River and a portion of the Baghnaddi (in the direction of its junction with the former) are navigable during the rains only. I do not think the navigation is capable of improvement. It is only during the few rainy months that boats can ply on these rivers, owing to the number of rocks which cover their beds every here and there.
>
> "There are about 225 small canoes (being simply trunks of trees hollowed out) used for the carriage of merchandise. There may be probably 200 more which could be made available in case of necessity. These are only used for the transport of grain; a canoe will carry from $1\frac{1}{4}$ to $1\frac{1}{2}$ ton, at an average cost of 2 annas 4 pie a mile.

The following account is taken from the Bhandara Settlement Report:—

> "During the early bursts of the monsoon navigation is not attempted; but ordinarily, during the rainy season, canoes ply on the river in every direction. Its broad bosom now takes the place of the fair-weather roads; its current carries the traveller down rapidly, but a voyage up stream is tardy and toilsome. The barriers at Chizgaon and Tiddi† prevent river traffic from becoming general. In fact, navigation is bounded by these impassable rocky steps. * * Rice and gram are carried in canoes scooped out of the trunks of trees. These canoes are in length about 30 feet, and have been hitherto made of teak trees from the Panabaras forest. But now, the bijasal is also coming into use for canoe purposes, as the supply of large teak is falling short. Fifteen years ago (from 1867) a teak canoe was obtainable at Rs. 60 or Rs. 70, now they run from Rs. 125 to Rs. 150. A good canoe lasts from 25 to 30 years. It has been computed that 100 canoes and 400 watermen are employed in the navigation of the Weinganga during the five months that it is open, and that 23,000 maunds of rice and other grain are brought down by it."

The Weinganga, below the junction of the Kanhan, again becomes navigable for these small river boats, and so continues through the Chanda rice country to Garcharoli; but from this point to a point level with Ahiri, in the south of the district, navigation is much more difficult. From Ahiri, which is considerably below the junction of the Wardha River, the Weinganga again becomes open, and this open section continues to a distance far below Sironcha. But the river traffic in this district is not considerable, and is confined to the months of August, September, October, and November. There is some amount of river traffic in the Sironcha section of the Godavari and of the Pranhita.

The late Officiating Deputy Commissioner writes thus:—

> "There is water communication through the whole length of the Sironcha taluk, and also along the length of the other three taluks; but except in very full floods, no boats could at present descend from the Sironcha to the other taluks. There used formerly to be boats on the upper portion of the rivers here, but all of them have now rotted away. There are no boats on the lower portion of the Gadavari in this district, but they can be procured from Rajamundry, and return boats can also sometimes be procured. A steamer too, occasionally during the rains, comes up as far as Tarlagudiam, which is nearly opposite Enchampilly and just below the second barrier on the Godavari. The boats used are flat-bottomed. These boats take down wheat and other grain, fibres, lac, turmeric, horns, &c., and bring up cloth, spices, &c. The ordinary cost per mile for one ton by boat carriage is 1 anna $1\frac{1}{2}$ pice, but for goods coming up stream the charge is about 1 anna 5 pies per mile. By steamer the charge is about 1 anna 2 pie per mile per ton."

In 1876–77 the river imports and exports of Sam-

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† At Tiddi and Magardhokra, above the junction of the Kanhan coming from Kamthi, there are heavy falls and dangerous whirlpools.

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balpur and Sironcha in connection with the Eastern coast are thus shown in the annual trade report:—

	Imports.		Exports.	
	Quantity in Maunds.	Value.	Quantity in Maunds.	Value.
Sambalpur	4,866	2,46,548	56,000	1,86,179
Sironcha	30,193	92,699	355	1,715

Grand schemes for the navigation of the Godavari have absolutely failed and have been abandoned, and nothing practicable has been suggested with regard to the navigation from Sambalpur to Cuttack.

BOMBAY, SIND.

Bombay, Sind.

Colonel Haig.

The Indus is the great highway of traffic in Sind. The Indus steam flotilla consists at present of 14 steamers and 36 barges, and the country craft registered by the Conservancy Department number between 4,000 and 5,000. The number registered in 1876–77, when river traffic was exceptionally active, was 4,655. These vessels consist of the "Zorak," a large boat built in the Punjab, and the common Sindhi boat. The former is an excellent cargo boat, sometimes of 70 or 80 tons; the latter ranges from six or seven to 60 tons. The charge for goods by steamer is on the average—

Up river	Down river
9·48 pies	6.27 pies

per ton per mile.

By native craft the charge is—

Up river	Down river
2½ pies	3 pies

per ton per mile.

Cargo up river is not so easily obtainable by native craft as down river.

34. The remaining questions of Chapter I. seem to have no applicability to this province, and may therefore be passed over.

MADRAS.

Madras.

Board of Revenue.

The main line of water communication in the presidency is the Buckingham Canal, which starts from the southern end of the Commamoor Canal in the Kistna district, and will, when completed, run right through the districts of Nellore, Chingleput, and South Arcot to Vedarnium in Tanjore. The total length of water carriage on this line, inclusive of the Commamoor Canal, will then be 598 miles, which may be divided into sections, as shown hereunder:—

	Miles.
Commamoor Fresh-water Canal.	
From Cocanada fresh-water canals viâ Dowlaishvaram, Ellore, and Bezwada to the Junction lock of the Buckingham Canal -	192
Buckingham Salt-water Canal.	
From Junction lock to Madras and Adyar (completed) - - - - - -	204
From Madras and Adyar to Markanum (completed) - - - - - -	65
From Markanum to Cuddalore (not completed)	37
From Cuddalore to Negapatam (portions completed) - - - - -	68
From Negapatam to Vedarnium (completed)	32
Total distance from Cocanada to Vedarnium	598

It is expected that the Madras Irrigation Company will shortly complete their arrangements for navigation, and there will then be canal communication between Kurnool and Cuddapah. The other canal communications in the presidency may be said to be all local. In the Godavari district, besides the above-mentioned through canal, there are canals from Rajahmundry to Amalapur, Narsapur, Mogaltur, Samulcotta, Rajolu, Tanuku, and Coringa, besides some other minor navigable channels. All are connected with the Godavari anicut, and are regulated by means of locks. In the Kistna district, in addition to the Commamoor Canal, one runs from Bezwada to the port of Masulipatam, and another from Bezwada to the salt station and seaport of Nizampatam. A third canal is navigable for about 21 miles to Kollur. The canals in the Kistna district are usually closed for about three months in the year to clear out the silt.

The only other district in which there is any important canal communication is Malabar, where there are extensive natural backwaters running parallel to the coast, and joined by artificial channels forming three sections of coast canal not as yet connected with one another, viz.:—

	Miles.
From Cochin to Tirur - - - -	78
From Beypore to Badagara - - - -	43
From Boliapatam to the Canara frontier -	22
Total - -	143

In Ganjam there is a short and not much used canal connecting the Chilka Lake with the port of Ganjam.

River navigation, to any extent worth speaking of, is confined to the Godavari and Kistna Rivers on the east coast, and to the numerous streams from the Western ghauts, in the districts of Malabar and Canara, many of which skirt the coast for miles before actually turning into the sea. The Chilka Lake is a means of communication between Ganjam and Puri.

With reference to the kind of boats used, and their number, the nature of the traffic, &c., the collector of the Godavari gives somewhat indefinite information. He merely says, "Cargo and transit boats are "used on them. They generally afford good accom"modation. They carry passengers, and all sorts of "cargo, paddy, cholum, ragi, and other articles of "merchandise are brought in from the interior. "These boats number about 3,000 or 4,000. The "canals are all connected with the Godavari anicut, "and are regulated by means of locks."

The collector of the Kistna is more explicit, and says:—"The superintending engineer estimates the "number of boats plying in the Kistna and Godavari "canals at no less than 2,000. They are of various "descriptions, with a tonnage of from 5 to 40 tons. "They carry both passengers and goods, but the "greater number carry goods only. They are chiefly "used for the carriage of grain and cotton, and there "is also a constant passenger traffic. All boats using "the canal are obliged to take out licenses or pay "a special fee. The rates differ according as they "are passenger or goods boats only, and of passenger "boats there are two classes. The cost of carriage "by boat is very much cheaper than by road, and "may be taken at three pies and upwards per ton per "mile."

The following particulars are taken from the Public Works Administration Report for 1877–78:—

Godavari District.

Passenger boats - - -	120
Cargo boats - - - -	1,671

Value of cargoes Rs. 36,965,022 (arbitrary valuation).

Navigation receipts, Rupees 44,927.

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MADRAS.

Board of Revenue.

Kistna District.

Passenger boats	36
Cargo boats	628

Value of cargoes 6,108,671 (arbitrary valuation).
Navigation receipts, Rupees 17,184.

The charge for boat licenses in the Godavari district was raised in 1877 from one rupee to two rupees a ton, and it is in contemplation to raise it in the Kistna when the result has been observed.

A copy of the rules and bye-laws will be found in the appendix.

From Nellore it is reported:—"The boats in use "here are flat-bottomed, from 1 to 40 tons burden, "with masts and sails. The boats generally used by "passengers are called top-boats. They carry five "tons. One-third of the deck is covered in with a "waterproof planked roof and curtained with mats or "cloth. Oil-seeds, chillies, grain, firewood, and "various other kinds of produce are carried to and "fro. During April and May and June the average "monthly imports by the canal to Madras amounted "to 20,000 tons, most of which went from this "district. There are about 2,000 boats carrying "about 15,000 tons on the canal, of which perhaps "about 100 belong to this district, where most of the "canal is new * * * * * * * * * "The ordinary cost per mile of boat carriage for one "ton is about 3 pies, but it varies greatly now, "because there are not sufficient boats to meet the "demand. This will soon be remedied. Large "cargo boats often carry at 2 pies per mile per ton."

The collector of Chingleput writes as regards his district:—"The use of the canals is chiefly to carry "the salt manufactured by Government; a con- "siderable quantity of firewood is carried, and some "produce and dry fish; they are also much used for "passenger traffic. The total number of boats on "both canals is 1,311. Of these 437 are passenger "and 874 cargo * * * * * The ordinary "cost of boat-carriage per mile for one ton is 5 pies." Mr. Price also appends a copy of the rules connected with the Northern Canal, and says that the southern are under the license system.

The canal communication in South Arcot is at present in such a transition state in connection with the southern extension of the Buckingham Canal that it is unnecessary to reproduce here the details given regarding existing boats and traffic.

With regard to the canal from Negapatam to Vedarnium, which at present is an isolated section, the collector of Tanjore writes:—"There are 34 boats "(similar to sea-going cargo boats), and of size "varying from 3 to 10 tons in capacity, engaged in "carrying the salt and tobacco from Vedarnium, and "a toll in the shape of a registration fee of 4 annas a "year is levied on each boat plying on the canal. "The cost of carriage of one ton is 6 pies per mile."

In Malabar the navigation of the artificial channels connecting the backwaters is under no regulation. There is only one substantially built lock at which a trifling fee is levied on all boats passing through it.

The above remarks have had reference chiefly to artificial canals. With regard to river navigation it may be stated that the Godavari is navigable, in reaches, for the greater part of the year throughout the whole length of the district above the anicut, and two large steamers are worked on it. Below the anicut it is permanently navigable as far as the tide goes, and up to the anicut during freshes. The Kistna is also navigable for a part of the year, but is very little used for the purpose.

In Malabar and Canara the rivers and backwaters are freely used for navigation, and, as already stated the natural facilities in the former district are supplemented by artificial channels so as to form a continuous line of coast canal. The collector of Canara writes:—"There is water communication between the "sea coast and the interior by means of the numerous "rivers which rise in the Western ghauts. These "rivers connect most of the seaports with the villages "in the interior to some distance, and a brisk trade, "chiefly consisting of rice, betel-nut, cocoanuts, and "firewood, is carried to the coast. The merchandise "is conveyed in boats of various sizes and capacities "from ½ a ton to 4½ tons, according to the depth or "shallowness of water in each river. The number of "these boats amount to 3,794. The navigation is "carried on under no regulation, and is not capable "of improvement except at a heavy expenditure. "The ordinary cost per mile of boat carriage for one "ton is about 1 anna."

In Malabar the condition of river and backwater navigation are very similar. The collector has omitted to give the cost of carriage per ton, and his estimate of the number of boats, 1,994, seems unduly low. The artificial canals connecting the backwaters are not, as a rule, in a very efficient state.

With regard to improvements to the existing water communication the collector of Godavari refers to projected extensions, and the collector of Chingleput suggests the improvement of the existing navigation by the use of steam towing-boats and dredges, and the construction of proper landing wharves and basins. As regards the proposal to introduce steam tugs, the Board would observe that the essential advantage of a canal is its cheapness. Steam tugs involve increased expense, especially in this country, and, although increased speed might be obtained, it is in no way a desideratum under present circumstances. The extension of the Godavari system, and the other improvements referred to by Mr. Price, would no doubt be very desirable in themselves; but the Board have no data before them on which to form an opinion of their financial practicability. The collectors of Malabar and Canara advocate the completion of the West Coast Canal, for which the existing backwaters afford such great natural facilities, and if canal extension is to be carried on from provincial funds, as is now being done in the case of the Buckingham Canal, the Board consider that the West Coast Canal should be the work next taken in hand; but with the information at present before them, they are not prepared to offer an opinion as to whether the provincial funds available for communications can be best expended on roads or on canals.

In connection with the question of water communication, it may not be out of place to mention the facilities afforded to coasting traffic by the British India Steam Navigation Company, which carries on a weekly service in both directions between Calcutta and Bombay, calling at the under-mentioned ports in the Madras presidency:—

Gopaulpore.
Calingapatam.
Bimlipatam.
Vizagapatam.
Cocanada.
Masulipatam.
Madras.
Negapatam.
Tuticorin.
Cochin.
Beypore.
Calicut.
Tellicherry.
Cannanore.
Mangalore.

In the case of Calingapatam and Masulipatam, however, it is only every alternate steamer that calls, and the ports of Cochin, Beypore, Calicut, Cannanore, Tellicherry, and Mangalore are frequently inaccessible during the prevalence of the south-west monsoon, and the steamers then stop at the small port of Narrakal, in the Cochin territory. In the case of Mangalore it may be said that the port is closed throughout the whole period of the monsoon.

In addition to the above there is a fortnightly service to and from Rangoon, calling regularly at the ports of Masulipatam, Cocanada, Vizagapatam, and Bimlipatam, and once a month at Calingapatam, Barwah, and Gopaulpore.

CHAP. I. QN.

CHAPTER I.—QUESTION 21.

Is there any portion of your province into which, by reason of the want or the badness of the roads or other means of access, or of local or temporary disturbing causes of weather, &c., it might be impossible or difficult for unassisted trade in time of scarcity to throw enough grain to feed (say) one-quarter of the population for six months? If there is such a part, state where it is, what is its area and population, and what are the special difficulties to be overcome, and how they might best be removed?

PUNJAB.

PUNJAB.

Major Wac

The principal difficulty in answering this question for the Punjab is, that the records of the years 1860–61 and 1868–69 (the years of famine in the Punjab) go to show that, partly owing to the movements of people towards the centres of trade and towards the tracts least famine-stricken, and partly owing to the activity of trade and carriage, a failure of food supplies, such as the question contemplates, is unlikely in any part of this province.

It is clearly unnecessary to consider the question in respect of the districts traversed by and immediately adjoining the railway lines. But it may be of use to give the data which justify the assumption of the sufficiency of trade to import a half-year's food for a quarter of the population in the tracts more distant from the railway; viz., (1) the Hissar division, and (2) the Derajat division and Jhang district.

(1.) Of the Hissar division the population is 1,232,435 souls. A fourth of this population, consuming, at famine rations, say ½ ser per head per diem, would require a daily supply of say 4,000 maunds per diem. Delhi is 10 marches from Hissar, and Sirsa is a similar distance from Ferozepore and the Sutlej. On an average, we may assume that a camel would deliver at the various points in the division where grain was wanted two loads in a month, 4,000 maunds, equal 800 camel loads, or say 1,000. So we should need 15,000 camels. The Hissar division alone possesses over 25,000 camels, and over 11,000 carts. The latter will carry on the worst road twice as much as a camel.

(2.) The aggregate population of the Deraját division and Jhung district is 1,339,278. A fourth of the population would consume (at the same rate as above) say 4,200 maunds per diem. As Dera Ismail Khan is 12 marches from Mooltan, the amount of carriage required would be a little more than in the previous case, say 20,000 camels. The Deraját and Mooltan divisions together possess 88,000 camels; and, besides these, river carriage by native boats would certainly be largely used.

(3.) A third possible case can be suggested; viz., such a very unusual failure of autumn crops as occurred in 1877 in the hill tracts of Hazára. The population of these tracts (tahsíls Abbottabad and Mansahra) is 227,561; a fourth of this population would consume, at above rate, say 750 maunds per diem. With camels delivering from Rawalpindi two loads a month, about 2,850 camels would be needed to keep up the required supply. The adjacent district of Rawalpindi alone possesses 7,600 camels. Camels can work on the main roads of Hazára.

It seems unnecessary to enter into further calculations on this subject.

NORTH-WESTERN PROVINCES AND OUDH.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

A road map has been prepared in which those areas are marked off and coloured grey which appear from the district officers' replies to be more or less cut off from communication with the rest of the provinces for some portion of the year; on each tract its area (in square miles), and population have been marked, if it has been possible to ascertain these from the district reply or any other source (such as settlement reports). The condition of each of these tracts will be noticed separately, and any proposals will be quoted which have been made by the district officer for improvement of its communications. All the tracts lie on the borders of the provinces in country either hilly or close under hills, and intersected by streams and torrents, which make the maintenance of practicable roads extremely difficult. It is in the rainy season, when the streams are full, that the communications are interrupted; at other times of the year it would appear that all of the tracts are more or less accessible.

The distribution of these tracts, as marked on the map, is very irregular. The Gonda district, for instance, is represented as being furnished with good communications right up to the Nepal boundary, and it interrupts a line of country inaccessible in the rains, which runs from Gorakhpur to Sitapur. These irregularities are probably due in some part to the different meanings attached to query 21 by different officers, as well as to differences in the condition of neighbouring districts. It is known, for instance, that a certain portion of the Bijnor district is quite cut off in the rains from all communications with either the rest of Bijnor or the Saháranpur district, though this has not been noticed by the collector.

As to the peculiar conditions of the different tracts which have been marked on the map as insufficiently connected with the rest of the provinces, it will be sufficient to quote the remarks of the district officer within whose district each is situated.

"*Lalitpur.*—The means of communication, as regards the interior of the district, are good. There is one metalled and bridged road running through it from north to south, and the trading towns, such as they are, are connected by good fair-weather roads. As regards communication with other districts, nothing could be worse. To the north the district is bounded by the River Betwa, an unbridged mountain stream. Across this there is a causeway at Jherrar by which all traffic passes from November till June, but, as soon as the river gets flooded, it is impassable at this point, and traffic then goes by an unmetalled road viâ Siras ghát, where there are boats. By the metalled road crossing the river at Jherrar, Jhánsi is 57 miles from Lalitpur town; by the Siras it is 63 miles, of which seven miles from Tálbáhat to Sirás are unmetalled, and in some parts unbridged. But even the Siras crossing is not at all times practicable, and all traffic is occasionally closed for a week or 10 days at a time by the flooding of the river. This flooding is not governed by local rains, but by the rains in Bhopal, so that it is impossible to be sure at any time in the rains whether the river is passable or not.

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

"To the south this road is metalled and bridged as far as Bhileau ghát on the boundary of this district, but beyond it as far as Saugor, 43 miles, the road exists in name only, and is utterly impassable for wheeled traffic after the first fall of rain, the soil being within a few miles of Saugor black cotton. I have before urged the expediency of metalling this road, for from the Saugor district comes our supply of wheat, barley, gram, &c.

"Should it not be considered expedient to metal this road, and the Central provinces Government is, I believe, not inclined to do the work, justly arguing that the Central provinces would get no benefit therefrom, I would suggest that a good road should be run to Bálábahat in this district, leaving the Jhánsi and Saugor metalled road some four miles north of Gonah, and continued in the Saugor district to Khemlasa and Khorei, the great grain and cattle markets. Were this done, Lalitpur would be safe, as far as supplies of food go, as long as the Saugor district were not attacked by famine. In 1869 I had to get grain for Jhánsi, at Colonel Lloyd's request, from the Saugor district during the rain, and it had to be brought up by camels, &c., and then with great difficulty, owing to the want of a good road.

"*Mirzapur.*—The portion of the Mirzapur district known as the Robertsganj tahsîl, containing an area of 2,632 square miles and a population of 173,540, is awkwardly situated for drawing its supplies from other sources in case of local failure of grain supply.

"Its boundary extends some 100 miles south of Mirzapur and Chunár, the nearest points on the line of railway.

"The traffic is carried on entirely by means of pack-bullocks.

"As a rule, it never imports grain for its own use, but brinjaras bring grain from Sarguja, Rattanpur, and the south, which is again re-exported northward.

"Grain is generally cheaper in Robertsganj than in other tahsîls, owing to the excessive cost of carriage by pack-bullocks.

"To endeavour to import food grain into this portion of the district in the event of great scarcity would be very difficult, and probably private enterprise would fail altogether.

"If assistance were given by Government, however, the difficulties could be overcome. The population is thin, being only 66 to the square mile; the inhabitants are entirely agricultural, of low caste, and very poor. To a large extent they support themselves upon the produce of the forest and jungles; and should the crops in the neighbouring districts of Surguja and Palamau prove good, supplies would come to them from that quarter.

"*Gorakhpur.*—There is such a tract in the north of this district.

"It lies north of the Mahárájganj tahsîl, under the tarâi, and is some 25 miles broad by 18 miles deep, containing an area of some 450 square miles.

"It is without road or any means of access save footpaths and the roughest cart tracks, and the Rohin river.

"Owing to the rising of the river and the absence of communications it might at some time be impossible for unassisted trade to throw enough grain into this part to feed a portion of the population, if food utterly failed.

"Such a fear was entertained in 1874, and advances were given by Government for grain to be stored there, but eventually the grain in the markets, or supplied by means of relief works, was found to be sufficient during that distress.

"This part of the district requires development, and one of my proposals was (in case of relief works on a large scale being required this year) to open a new road right through the centre of this tract from the Mahárájgang tahsîl viâ Chauk (a Government forest depôt, and Sakwi, a timber depôt on the Rohin) to Deoghát on the Nepaul frontier under the large Nepal forest of Hardi Girma. This road would be about 31 miles long, and would be of the greatest benefit to this portion of the district, besides developing the timber trade with Nepal.

"*Basti.*—The northern garganas must be inaccessible in bad weather to trading operations of any magnitude, suffering, like other sub-Himalyan tracts, from the want of bridges. All such tracts are much cut up by hill streams. Writing of tappa Galaur the Settlement Officer remarks, 'The villages are almost 'all cut off from each other and from those in the 'neighbourhood by streams or jhils, which are only 'fordable here and there.'

"Yet, as I have pointed out elsewhere, the timber from which every one of these streams might be cheaply and efficiently bridged grows close at hand in the Government forests. If, however, a district officer wishes to bridge a stream he has to draw out an estimate, in which every log of wood has to be charged (though procured from the Forest Department) at the rates levied by private firms. These sub-montane districts are the largest of all, yet, having much waste and jungle land included in their area, their local funds are very poor, considering the great extent of roadways which have to be kept up. Consequently, the estimate when made up is but too often found to be higher than what the local funds can afford. No one beyond the district limits seems to be able to appreciate that insistence on money payments in such cases leads to no actual gain to Government, while on the other hand all the indirect gain from public improvements is lost. Government is most anxious to improve trade with Nepal, to prevent famine by improving communications, to open out waste lands, and to prove itself generally a Government of progress; yet when it comes to the point of using one part of its property to improve another, red tapeism is allowed to step in, and with illusory figures to bar the way; the trees grow on to rot and die, while the rivers go on unbridged for ever. Our engineers, too, have an overweening partiality for masonry bridges in preference to those of wood, though in the parts I write of clay and lime are scarce. Sál wood will last at least 100 years, and with skill in design wooden bridges can be adapted to any stream, however rapid.

"District officers should be allowed to indent without payment on the Government forests for any timber required for the bridging of public roads, and, properly worked, such an order ought to give a great stimulus to the traffic in frontier districts.

"Otherwise Government forests ought to be charged with cesses according to their areas, in common with the other revenue-paying portions of the districts, and at the same rates as average revenue paid on cultivation.

"*Bahraich.*—There are tracts in the north of the district into which it would, at present, be extremely difficult in time of scarcity to throw grain. These are the parganas of Dharmanpur and Tulsipur, and the tarâi villages of parganas Bhinga and Ikauna, area in acres—malguzari 226,131 and forest 22,355, total 451,486; number of villages 171 and population 66,178. The roads are merely fair-weather (surface) ones, and rivers presenting more or less difficulties to crossing intervene. In these tracts rice is extensively cultivated, and when drought occurs the people are sometimes in serious straits.

"This was the case in 1873, when the trans-Rapti tract suffered severely.

"The proposed railway from Bahramghát to Bahraich and from the eastern districts to Bahraich will, if supplemented by improved feeder roads, much lessen the danger, and at the same time immensely increase the value and cultivation of these tracts. Moreover, if the trade with Nepal should increase, the expediency of extending the Bahramghát-Bahraich Railway to Nanpára might be considered.

"*Sitapur.*—There is a tract like the one described in the country between the Chauk (Sárda) and the Gogra, an area of about 400 square miles. To make

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Buck.

the roads passable in the rains they would have to be raised and metalled, and numerous drain bridges made. The rivers Chauka, Ul, and Kewáni are too broad to be bridged.

"*Kumaun.*—There is one portion of the district which would be greatly assisted in times of scarcity by the existence of a cart road. It is that lying along the border of Garhwál, and comprises the parganas of Pálipacháun and Dánpur. . The same road would also materially assist the parts of Garhwál coterminous with the above parganas. This road would run from Rámnagar viâ Mohan up the valley of the Rámganga as far as Gunai, and by it grain could be conveyed to a spot very central for the people of both Kumaun and Garhwál; for if famine ever should occur in these hills the most critical time would be the hot months and the rains. During the cold season the people can go to the Bhábar and procure grain for themselves, but during the rest of the year the Bhábar is very unhealthy for all but persons acclimatised, and men from the higher hills would sooner die of starvation than go there. A cart road to Gunai would allow of grain being stored at a spot where all the people could go to purchase it without fear of sickness. It would not be a costly work, as a great part of the line would be up the valley of the Rámganga, where it could be cheaply made.

" *Garhwál.*—Garhwál wants two iron bridges, and until they are constructed the district is isolated from the plains during the rains and sometimes even in winter. These two bridges—one over the Nayar and the other over the Koh river—should be erected at once, for until they are a serious season of drought might cause immense loss of life to an isolated population; and as the road which crosses these two rivers is our sole postal line and trade route for the plains, it is necessary to enlarge on the necessity for immediate action.

"It would be quite impossible for unassisted trade until the rivers Nayer and Koh are bridged to throw enough to feed a quarter of the population of Garhwál for six months into this district. If scarcity appeared, and the Nayar and Koh rivers were in flood, no traffic could approach the points where food would be most needed. In an isolated district of about 5,500 square miles and a population of about 310,282 people, it is not easy to point out any particular area or portion of the population which would suffer most; I would say generally the parganas to the south of the Almora road, as they are most liable to drought and furthest away from the main lines of communication."

There is, then, but a very small area of these provinces which is so badly provided with communication as to be altogether cut off from the outside during any portion of the year. But if in this area is to be included every tract into which it would be difficult or impossible to throw enough grain to feed one-quarter of the population for six months, it would comprehend some other portions of the provinces which are at considerable distances from railway communication. When the distance to be traversed by road is short, and there is a sufficient store of grain to draw upon, it would seem that ordinary district carts could transport the amount required. The Bijnor district is some 30 miles from the Muzaffarnagar station on the Sind, Pánjab, and Delhi Railway, with which it is connected by two second-class roads. Muzaffarnagar is one of the chief grain marts in the provinces, and collected grain in large quantities from the Punjáb during the past scarcity. The population of the Bijnor district is, roughly speaking, 774,000, and at the rate of 18 ounces per head per diem, it would require about 17,750 tons of grain at least to feed one-quarter of this population for six months. This is equal to some 4,80,008 maunds. During the year ending 31st March 1878 (six months of which were identical with the period of the greatest distress in Rohilkhand) the amount of grain which crossed the Ganges from the Muzaffarnagar into the Bijnor district by the two chief ferries was over 1,200,000 maunds. Nearly all this must have travelled between 30 to 40 miles by cart before it reached the Bijnor district. It is believed that some 4,00,000 maunds at least of this merely passed through a portion of the Bijnor district on its way to the neighbouring district of Moradabad, and another large portion was also en route for the Tarái and hill districts. But the figures show that, given a railway to collect it, grain can be transported for a distance of at least 30 miles in almost any quantity required, provided that there is a good road for it to travel on, and that there is a sufficient number of carts available. The last condition will only exist on roads which are always lines of considerable traffic, such as the roads between the Doab and Rohilkhand are.

BENGAL.

BENGAL.

Mr. Toynl

Inaccessible Tracts.—It may be stated generally, that since communication with Orissa was opened by sea there is no part of Bengal into which enough food could not be thrown to meet any wants the occurrence of which is within the range of probability. Whether or not private trade could in all cases do what was needful without the assistance of Government, it is impossible to say. It would depend on such a vast number and variety of circumstances as could not possibly be predicated. Trade in Bengal has a tendency to confine itself to old and stereotyped routes, but when new routes are opened out it is not slow to take advantage of them. Its ramifications extend to all parts of the province, and there is no district which is not, in some way or another, already connected with the great trade routes described in the answer to questions 18, 19, and 20.

There is some central point in or near every district in Bengal to which private trade, unassisted, would in general be able to bring such food as was required, and the people who required it could safely be trusted to manage its internal distribution in all but very exceptional circumstances. A universal failure of the crops over the whole province would, of course, completely paralyse private trade; but such a contingency is not within the range of probability. It may be said that since the introduction of the Road Cess Act every district officer has it in his own power to remove any difficulties of transport that formerly existed. This cannot be done in a day, but it is being done gradually, and no special measures are called for at present to meet a future possibility.

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ENTRAL ROVINCES ND OUDH.

r. Nicholls.

CENTRAL PROVINCES.

The answer would depend almost entirely, first, on the distance from which supplies would have to be drawn, and, secondly, on the power of the people, as estimated by traders, to purchase supplies if brought into the distressed locality. I will leave out of the question at present the feudatory states. Looking first at the zemindari estates, and the chindwara jaghir estates, and the similar wild tracts of rajaborari and kalibhit in the Satpura hills, under Kurku Chiefs, it may be said that there are no traders who would be at all likely to engage to any appreciable extent in the importation of grain.

But, on the other hand, experience has shown us that the inhabitants of nearly all these tracts, what with their readiness to move to more fortunate localities and the resources which they possess in themselves and in their knowledge of the life-sustaining products of their forests, are practically independent of foreign importations, at least of large importations. And this holds good of nearly all the wild parts of the khalsa of Mandla, Balaghat, Bhandara, and Chanda.

For the rest of these four districts unassisted trade might be relied on, provided that the traders could procure grain at the nearest points on the railway, or in the west of Chhattisgarh, at such prices as would enable them to retail at home at rates which were not beyond the purchasing power of the people.

The districts of Nimar, Hoshangabad, Narsinghpur and Jubbulpore, Betul, Chhindwara, Seoni, Nagpur, and Wardha also are, in this respect, safe. I think Saugor and Damoh, even in the northern parts, would be safe, if the home population alone had to be considered. But these parts are liable to be called on to support the strain of feeding no inconsiderable portion of the population of many native states of Baghalkand and Brundelkand, together with probably some thousands of people from Lallutpur and Jhansi, or parts of Central India lying further west. Such a task would probably not be adequately provided for by the local traders.

I think such pressure could hardly be imagined as coming at the time of the year when stocks are lowest and the roads impassable, that is to say in the rainy season, because naturally the kharif crops would never come into the market before the close of the rains, and traders regulate their stocks and operations on this knowledge.

I have previously said that Sironcha, a sub-division of the Chanda district, on the Godavari, 130 miles below Chanda, is very isolated. Much of the population is self-reliant. There is some water communication. Its trade lies chiefly with the opposite districts in the Nizam's dominions, and unless these were severely stricken at the same time unassisted trade might be reckoned on to bring in the requisite food, but at what cost I am not prepared to estimate. I must also suppose that there are on the Nizam's side no artificial restrictions, no prohibition of exports, and no prohibitive transit duties. The area which could not be considered self-reliant in respect of its supplies of jungle produce would not exceed 300 square miles, with a population of few thousands. The difficulty lies in its isolation. On the north it is bordered by the vast wilderness of Bustar, the navigation of the Godavari is rendered difficult by the triple barriers across that river which cut it off from the rich Delta country and the sea coast; and on the north-west, up the Pranheta country, it is separated from any large tracts of cultivation by the forests of Ahiri. But on the opposite side of the Godavari the districts of his Highness the Nizam, lying north and north-west of Warangol, abound in great irrigation tanks, and are perhaps safer than any other part of the Deccan against famine from drought.

Coming next to Sambalpur, the question is whether, irrespective of existing stocks, unassisted trade could lay down enough food to support for six months one-quarter of the population of the khalsa. To this might perhaps be added the probable requirements of the Chanderpur zemindari, also of Phuljhar, and the feudatory states of Raigarh and Sarangarh. But we have already seen migration and resort to the forests pull the people of these states and zemindaris through a total loss of their staple crop.

Returning to the khalsa, with its 1,770 square miles and 90,756 inhabitants, it is required to lay down 8,500 tons of ricc. Until the failure of the bahal and berna rice lands is pretty sure, there cannot, I imagine, arise any necessity for importation by traders. The requirements would be 1,400 tons a month, to be brought at a time when the river is lowest. The total carrying power of the boats enumerated by Major Scott is 26,000 maunds, of which a third part could not be employed at the time of the year when wanted. It would be unsafe to calculate on more than one trip from Cuttack to Sambalpur and back in a month.

The district is land-locked and isolated.

Distances are—

Bilaspur - - - - -	144
Seorinarain - - -	105
Raipur - - - - -	170
Cuttack - - - -	150

At present these are the only practical routes by which grain could be obtained in any considerable quantities. It may be assumed that the same unfavourable season which necessitates import into Sambalpur will affect in an equally disastrous degree either Cuttack or Chhattisgarh or both.

But supposing that both Cuttack and Chhattisgarh could supply the requisite grain, it unfortunately happens that Sambalpur has not the requisite carts and cattle for the land carriage, or boats for the river traffic. River communication with Chhattisgarh at this time of the year would be practically impossible, and the quantity which could be brought up the river from Cuttack by the existing boats would be quite inadequate. Until, in the course of time, from the increase of ordinary traffic between Cuttack and Sambalpur, the number of boats is vastly increased, no great alteration can be expected. The land carriage of Chhattisgarh is now fully occupied in other directions to the westward; to the eastern coast through Kalahandi and Karriar, to Jubbulpore through Mandla, and to Mirzapur through Rewah, the available brinjaras are generally fully engaged.

Therefore, I conclude that, even if we assume the traders had the will to import and the money to purchase, they would not be able to import without Government aid (and probably not even with such aid) six months' provisions for a quarter part of the population, 90,750 people, month by month, on a sudden requisition or emergency.

As for remedies, perhaps the navigation of the Mahanadi might be somewhat improved; the roads towards Cuttack, towards Midnapur and Ranchi, might be improved. The road to Binka, 28 miles south of Sambalpur, on the river, to which point the navigation is more free, might be advantageously improved. The advent of the railway to the western portal of Chhattisgarh at Kaltianpur will set free much of the land carriage of Raipur and Bilaspur, and this, with the progressing improvement of the road from Jubbulpore through Mandla towards Bilaspur, will tend to decrease the employment of brinjara tandas in the carrying trade towards Jubbulpore and Mirzapur.

At present, and until the railway from Nagpur to Killianpur shall have been completed, Chhattisgarh will remain a land-locked country, an "Orissa without a sea-board."

Central Provinces.

Mr. Nicholls.

In Chhattisgarh proper the khalsa area is 11,086 square miles, with a population of 1,752,362.

It is required to bring into it, on a sudden emergency, 3,942,814 maunds or 146,030 tons of grain, or at the best 657,138 maunds or 24,340 tons, month by month. It could draw almost nothing from Bastar, little from the eastern coast, less from Korea and Sirgujan and Mirzapur on the north; it must depend on its imports from Jubbulpore, and from the valley of the Weinganga and the more distant railway at Nagpur. The Sambalpur district might perhaps be able to help, but this could not be assured. The available carriage seems to be quite inadequate, at any rate towards the east of the Raipur and nearly all the Bilaspur district. The remedy is in the opening of the railway to Kallianpur, and if this railway were connected with Jubbulpore it would be all the more effective. It will be unnecessary to give my detailed calculation on this subject.

BERAR.

Berar.

Mr. Dunlop.

Mr. Jones.

Mr. Dunlop.—In the greater portion of the Wun district, but more particularly in the south, owing to the want of roads it would be impossible in time of scarcity to throw enough grain to feed one-quarter of the population for six months. In dry weather it might be done with difficulty, but in the rains it would be impossible.

The only way to remedy this is by constructing good roads traversable at all seasons of the year. At present there are only 29 miles of finished road (and that has an unbridged river in the middle) in the 3,907 square miles of which this district consists. Whilst such a state of things continues the people can fairly complain that in the event of famine they are cut off from all chance of escape.

The population of the Wun district, according to the census of 1867, but allowing for subsequent territorial changes, is 323,762 persons.

Mr. Jones.—In speaking of the south of Wun as isolated, Mr. Dunlop has forgotten the Wurdah Valley State Railway, the terminus of which, Wurora, is within 12 miles of Wun itself. This, with a road now about to be constructed in the interior, will make Wun as safe as any other part of Berar.

BOMBAY.

Bombay.

Mr. Peile.

In most of the Bombay districts no difficulty is anticipated in throwing enough grain into any part of them to feed one-quarter of the people for six months by means of unassisted trade. At the same time, better communications would make the process much cheaper and easier, and lessen the danger of a break-down from failure of carriage or forage.

The exceptions are—

*In Kaladgi.**—The five talukas lying south of the Done nullah, viz. Badami, Bagalkot, Húngund, Mudibhehal, and Bagewadi. Grain going to them from the railway has to pass the Done nullah and the river Krishna (unbridged), and the roads are very bad. A railway would entirely remove the difficulty.

In Dharwar.—The northern black-soil talukas Rón, Naolgúnd, and Gadak. The difficulties to be overcome are—(1) the distance from the coast, Rón being 150 miles from Carwar; (2) there is no metalled road leading either from Hubli or Gadak northward to Naolgúnd or Rón. In heavy rain the tracks over the black-soil become impassable.

In Ratnagiri.—The Mandargah petta on the Savitri river, and the Salshi mahal of the Deogarh taluka, to which it is difficult to transport supplies in the monsoon only. They could be relieved by Government agency.

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*Area, 3,199 square miles. Population, 524,458.

MADRAS.

Madras.

Board of Revenue.

The collectors of Bellary, Cuddapah, Kurnool, North Arcot, South Arcot, Chingleput, Tanjore, Trichinopoly, and Salam are distinctly of opinion that as regards their districts this question should be answered in the negative. The collector of Bellary, which was one of the districts that suffered most severely during the recent famine, writes as follows:—"The experience of 1877 has been amply sufficient "to prove in the clearest manner that there is no "part of this district into which it would be difficult "or impossible for unassisted trade to throw sufficient "food to feed one-quarter of the population "for six months. Much stress is laid on this answer, "as prior to 1876 this was not thought to be the "case."

The collector of Ganjam writes:—"There might "be a difficulty about sending grain into the Maliahs "or the wilder parts of Goomsur along the hills in "this district. But the population is so sparse there, "and they are so accustomed to eke out their food "by roots, leaves, &c., that I doubt famine ever "being very bad amongst them; and, except in the "case of the Maliah people, it would always be "simplest to make them come for their food. A "famine in the Maliahs, if possible (it is most im-"probable), could only be dealt with by making "depôts of food at the most accessible places above "ghauts, and directing the people to come for it "there."

The collector of Vizagapatam does not reply to the question, but the Board infer from his other replies that he would answer it in the negative.

In the Godavari there are certain jungle-tracts in which it might be difficult to throw in enough grain to feed one-quarter of the population for six months, and the collector very much doubts, if unassisted, trade would offer to attempt it.

Though the collector of the Kistna district considers that the answer to the question should be "no," he adds, "At the same time such a necessity may "arise, but for a much more limited period. At "the commencement of the period of famine in a "district like this, where road communication is "very imperfect, difficulty will always be felt for a "limited period, even amongst people who have "plenty of money. There is always a panic when "famine sets in, and the merchants in the large "market towns whence the country supplies are "drawn refuse to export supplies by cart through "fear of loots." The above extract is sufficient to show that the considerations which have induced the collector to qualify his answer are altogether outside the question of means of access.

Mr. Grose, the collector of Nellore, says:—"I do "not think there is any one tract in this district so "isolated as is described; but if all the western "tracts which are most remote from the sea had to "be supplied at once, I doubt if carts enough could

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"be secured. It must be remembered, too, that "famine is usually accompanied by drought, so that "cattle have no pasture, and grain cannot be moved "freely in carts. During the last famine cart traffic "was almost suspended from December till the "cyclone in May."

The collector of Madura considers that all parts of the district are accessible to cart or wheeled traffic, but difficulty is experienced during the rains.

From the Coimbatore district the collector reports that the Collegal taluk, with a population of 90,830, is the only part of the district into which it would be difficult for unassisted trade to throw grain in time of scarcity; and, as distance and bad roads have to be overcome, and rivers have to be crossed, he proposes one good metalled road, bridged where necessary, from Erode to Cusbah Collegal. The Board have to observe that the collector has not been taken into consideration the roads in the Mysore plateau on which Collegal is situated.

The Commissioner of the Nilgiris anticipates difficulty in supplying the South-east Wynaad under certain circumstances; but he adds, "With the "numerous ghats total cessation of supplies and "consequent starvation could hardly result."

The collector of Tinnevelly does not think there is any village in the district into which there would be a difficulty of throwing in supplies in times of drought, although there are many that are very inaccessible during the monsoon.

The collector of Malabar is of opinion that there might be difficulty in throwing supplies into parts of the Wynaad, and into the Attapadi Valley, but considers that the difficulty is not likely to be insurmountable or even considerable.

The collector of Canara alludes to the closing of the ports and difficulty of moving grain in any part of the district during the heavy rains from June to September, and proposes a railway from Bangalore and a canal up the coast. The Board have no doubt that the country generally would be very much benefited by the proposed railway and canal, but they cannot look upon them as urgently called for for the purpose contemplated by this particular question. A famine in Canara is a contingency so remote that it would be wasteful to spend money in precautions against it; and even if one were to occur the out-turn of the crops is known early in the year, and as the people are in the habit of laying in their stocks before the monsoon commences, it is then, when the ports are open, and not during the heavy monsoon, that private trade would exert itself.

Speaking generally of the presidency, the Board would say that, assuming private trade to be active and energetic, and confining themselves to considerations of means of access alone, there is no portion of the presidency into which grain could not be thrown by unassisted private trade in times of local scarcity. Difficulties undoubtedly would arise, but only such as could speedily be removed by the agency of the Local Fund Boards, who are now charged with the administration of the communications of the country. The isolation which it would be really difficult to meet would be that arising under circumstances similar to those noticed by Mr. Grose, viz., the isolation of the more remote portions of large famine-stricken tracts to which grain had to be brought from long distances with the means of cart carriage paralysed by want of pasturage. Nothing can remedy this but the development of the railway system.

In sparsely populated hill tracts such as those alluded to by the collectors of the Godavery, Ganjam, and Vizagapatum districts, the inducements offered to private trade are not such as to make it likely that it could be relied on in times of scarcity, but Government grain could be thrown in to central depôts to which the hill people could come and fetch it.

CENTRAL INDIA.

Mr. Wingate.

CENTRAL INDIA.

Baghelkhand.—The Sohagpur tract is 150 miles from the nearest railway station. The Kaimur hills lie across the direct route, and there are no roads. But pack-bullocks are used, and, the population being sparse, difficulty would only be experienced during the rains. There may be better communication with the Chota Nagpur side.

HAP.I. QN.22.

CHAPTER I.—QUESTION 22.

To what extent has telegraph communication been established between the chief towns of your province? Having in view the value of rapid communication in time of distress, are there any important lines which it might be desirable to construct?

PUNJAB.

Major Wace.

PUNJAB.

The Punjab is in telegraphic communication with the rest of India by two lines; of which one leaves the province at Delhi, and the other at Mooltan. The former directly connects the Punjab with the North-Western Provinces and Calcutta; the latter with Sind and Bombay. In the interior of the province the telegraph system consists of three principal lines. The first follows the railway line from Delhi to Lahore and Jhelum, and then by the trunk road to Peshâwar. The second follows the railway line from Lahore to Mooltan and Sakkar, in Sind. The third, starting from Sakkar (Rohri), in Sind, connects all the frontier stations on the west bank of the Indus northward to Kohât, where it is again connected with the first line at Rawalpindi, adding in the branch lines, viz., the branch connections with Rewâri, Simla,

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PUNJAB.

Major Wace.

Pattiála, Ferozepore, Dalhousie, Siálkot, Murrere, and Abbottabad; the total mileage of telegraph lines in the province is:—

	Miles.
(1.) Main line Delhi to Peshāwar	628
Branches—Delhi to Rewári (Rájputána State Railway)	51
Umballa to Pattiála	37
Do. Simla	79
Ludhiána to Ferozepore	77
Amritsar to Dalhousie	117
Wazírabad to Siálkot	25
Rawalpíndi to Murree	39·5
Kala-ke-Serai near Rawalpindi to Abbottabad	44
(2.) Main line, Lahore viâ Mooltan to Sakkar, in Sind	492·5
(3.) Main line, Sakkar to Kohât up the west bank of the Indus, and thence to Rawalpindi	404
Total miles	1,994

All this is permanent line. I have not reckoned a few purely temporary lines, now working mainly for military purposes.

By this system 23 out of 32 districts are in direct telegraphic communication both with Government and with the Commissioners of divisions. The nine districts lacking such communication are:—

(1.) Karnál, in the Delhi division, distant by metalled road 74 miles from Delhi and 47 miles from Umballa. The postal communication is by horsed carts and metalled road, which run in 13 hours from Delhi to Karnál, and in eight hours from Karnál to Umballa.

(2.) The three districts which compose the Hissar division, the head-quarters of each being connected with Delhi by a partly metalled road, and the distances from Delhi being:

Rohtak 45 miles, or by post - 7½ hours.
Hissar 104 „ „ - 19 „
Sirsa 53 „ „ - 30 „

The post is carried by horsed carts.

(3.) Hoshiárpur and Kángra, the head-quarters of the former being distant 24 miles; and that of the latter (at Dharmsála) 103 miles from the divisional head-quarters at Jullundur. The post is carried by foot runners on an unmetalled road.

(4.) Shahpur, of which the head-quarter is 99 miles distant from Jhelum, on the telegraph line between Rawalpindi and Lahore. The post is carried on an unmetalled road by foot runners, time 20 hours.

(5.) Muzaffargarh and Jhang, in the Mooltan division; of which the former is 16 miles distant from Mooltan, and the latter 60 miles from the Chichâwatni station, on the Mooltan and Lahore Railway. From Chichâwatni to Jhang the post is carried on an unmetalled road by horsed cart.

The Financial Commissioner is of opinion that there is no special urgency of the nature indicated in the question under reply for the completion of telegraphic communication with these nine districts. None of the distances are such as might not, if occasion required, be rapidly connected by temporary lines; and meantime the postal communications are reliable, and are never interrupted or delayed except by heavy rain or floods.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Captain Pitcher.

The East Indian Railway and the Oudh and Rohilkhand Railway, supplemented by the telegraphic offices at military stations like Sitapur, supply a fair number of telegraphic stations for the general events of the province, but for times of distress it is most desirable that every civil station should be in telegraphic communication with the rest of India.

The following stations have no telegraphic office:—Jhánsi, Lalitpur, Jalaun, Budaun, Mainpuri, Kheri, Bahraich, Gondah, Basti, Gorakhpur, Rae Bareli, Sultanpur, Partabgarh, Garhwal, and the Tarái. Hamírpur, Banda, Bijnor, and Azamgarh are probably also without them, but the officers of those districts have so far given no information.

BENGAL.

BENGAL.

Mr. Toynbe

The province is very well provided with telegraphic communication. In the province of Behar, including the two Commissionerships of Patna and Bhagalpur, and containing 12 districts, there is direct telegraphic communication with the head-quarters of all districts except Saran, Malda, and the Santhal pergunnahs. They are accessible from telegraph stations on the East Indian Railway. The telegraph to Gya is under construction.

In Orissa, out of three districts, only Purie is unprovided with a telegraph station, but it is only one night's post from Cuttack. A new line has lately been constructed to connect Cuttack with False Point. In Chota Nagpore, out of four districts, Hazaribagh is the only one provided with a telegraph station.

In the Chittagong division two districts out of three are in direct communication with Calcutta and each other. The exception is the Chittagong hill tracts.

In the Dacca division only two out of five districts have direct communication by telegraph. In the Faridpur district there is a telegraph station at Goalundo; only Backerganj and Mymensingh are entirely without telegraphic communication.

In the Rajshahai division Darjiling and Jalpaigori are in direct communication; the telegraph line on the Northern Bengal State Railway runs through all the other five districts, though they have not telegraph stations at their head-quarters.

In the Presidency division the only telegraph station is at Calcutta; Nadiya and Jessore can be reached from the Eastern Bengal Railway telegraph, and Murshidabad from the Azimganj Railway station.

Of the five districts of the Bardwan division three have telegraph stations; Bankura and Birbhum have not, but there is a telegraph station at Raniganj, a sub-division of the former, and Suri, the head-quarters station of the Birbhum district, is only 7 miles from the nearest telegraph station on the East Indian Railway.

Considering the existing postal facilities, and the fact that the districts hitherto most subject to famine are all already provided with telegraphic communica-

BENGAL.

Mr. Toynbee.

tion, except Saran, and that it is easily accessible from Arrah, it cannot be said that any additional telegraph lines are required in Bengal to meet the necessities of future famine administration. All the most important towns in the province are connected with each other and with Calcutta by telegraphic communication, and such lines as have any prospect at all of financial success have already been constructed. To sum up, 22 out of 43 districts in Bengal have telegraph stations at their head-quarters, 12 have lines of telegraph running through them, and more or less accessible to post or special messenger, while only nine are wholly unprovided with telegraphic communication, viz., Manbhum, Singbhum, Lohardagga, Puri, Maldah, Saran, Chittagong hill tracts, Backerganj, and Mymensingh. All these are within easy postal distance of the nearest telegraph station.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.

The existing telegraph lines follow the open lines of railway. The military station and important trading town of Kamptee is connected with the railway lines at Nagpur, 10 miles distant. This line is continued through Seoni to Jubbulpore, having a total length of 174 miles. Saugor is distant 75 miles from Kareli on the G. I. P. R., and a telegraph line runs beside the military road, connecting these points. The fortress of Assirgarh is distant 6 miles from the telegraph. The military posts and commercial towns of Raipur, Sambalpur, Hoshangabad, and Chanda, besides Sironcha, are not connected, nor is Pachmarhi, a military post and the sanitarium and hot-weather residence of the Chief Commissioner and staff. Hoshangabad, a military post on the frontier of the provinces, the crossing place for much of the Bhopal produce over the Nerbudda, and the head-quarters of a Commissioner of division, is distant 10 miles from the railway and telegraph lines. But the new railway would take the telegraph to Kallianpur, 50 miles distant from Raipur, the head-quarters of the Commissioner of the Chhattisgarh division.

Assuming that the telegraph will follow the railway to Kallianpur, the portal of Chhattisgarh, probably commercial and military considerations, over and above the considerations here referred to, would necessitate an extension to Raipur. On general grounds, extensions to Pachmarhi, and perhaps to Chanda, are eminently desirable. A line to Pachmarhi has, I understand, been sanctioned.

BOMBAY.

BOMBAY.

Mr. Peile.

The existing lines are :—

(1.) From Bombay North, through Surat, Broach, Baroda, and Ahmedabad, to Deesa, and thence into Sind and through Rajputana into the North-west; (2) from Bombay East, through Thana, Nasick, branch to Dhulia for Khandesh, Bhosawul, and so to Jubbulpore and Nagpore; and south-east to Poona, and thence (*a*) to Sholapur and so to Hydrabad, Madras, and Bangalore, (*b*) by Satara, Kolhapur, Belgaum, Dharwar, and Hubli, to Bellary, and so to Madras and Bellary, with branches from Belgaum to Vingorla and Goa, and from Dharwar to Carwar and Coompta in Canara. Communication exists with Ahmednagar by a line between Dhond and Manmar. The principal towns left out by this system of lines are Ratnagiri and Kaladgi or Bijápur. Proposals by the collector of Ratnagiri to construct a telegraph line from Kolhapur to Ratnagiri, Chiplun, and Rajapur are under consideration. A line from Sholapur through Bijapur and Kaladgi to Dharwar is very necessary for rapid communication in a famine. The collector of Kaladgi says —"Telegrams generally arrive with their postal advices, sometimes a day or so later."

MADRAS.

MADRAS

Board of Revenue.

The Board have not much to say with reference to this question. With the exception of Chittoor, which is within 18 miles of a railway station, telegraphic communication exists between all district head-quarters and the presidency town, as well as along all the lines of railway; and as temporary lines can always be run up when desired, the Board do not consider that the desirability of having rapid communication in times of distress necessitates the establishment of permanent stations involving a financial loss. At present new stations are always established experimentally wherever there is any reason to believe that they will pay, and continued as a permanency if the result of the trial is satisfactory. If lines of rail are increased, telegraphs must necessarily accompany them.

CHAPTER I.—QUESTION 23.

Has there been within the historic period any sensible denudation of the forest in, or bordering on, your province? Can it be tested by statistics showing over how much area forest or scrub jungle has been cut down? Can you state any specific facts which lead you to think that such deforestation has caused injurious effects in any way, either in respect to the fall of rain or the abundance or permanence of water in streams, or wells, or the subsoil, or the denudation of the surface soil, so as to render it unfit for cultivation? And what injury has been produced, and to what extent? Can you adduce any direct evidence that such injury as you think has been caused by the clearing of the forest has been remedied by its reproduction? If you think the clearance has been injurious, what steps would you propose to take towards reboisement? Should it be done by artificial planting, or by conservation of the tract, so as to keep out cattle grazing and fires? Can such conservation be effected without interfering with any vested rights of the people, or with their consent, if interference is necessary? Which of the two methods would be easiest, cheapest, quickest of operation, and most effectual? To what extent, and on how large an area, could either method be followed?

PUNJAB.

PUNJAB.

Major Wace

The reply to this question is furnished by Mr. Baden Powell, C.S., Conservator of Forests in the Punjab. It is annexed in full. The Financial Commissioner desires me to remark thereon, that, in his opinion, the question whether there has been in the Punjab deforestation of the injurious nature described above must be answered in the negative or left in doubt; except as regards the lower hills of the Hoshiárpur district, where mischief to the adjacent lands below has no doubt occurred from the excessive denudation of the hills, caused by the increased population and manufactures of the district, and by public works on a scale of magnitude previously unknown in that part of the country.

Also, as regards the concluding paragraphs of the conservator's reply, the Financial Commissioner observes that, though in the abstract the Conservator's arguments are correct, the facts, as implied in head 2 of the argument, are likely to give a wrong impression. The conflict is not between vast public interests and the private interests of 10 or 12 cattle owners, but between public interests of a very limited description, which it is proposed to benefit by measures of forest conservancy of doubtful efficacy, and the harrying and discontenting of a whole country-side which those measures involve.

Mr. Baden Powel

There is only one general remark I have to make on the following answers. The questions set me are very properly directed to ascertain actual facts and results, and not to evoke theories. Forest facts and forest results can only be produced in a series of years; when, therefore, it is remembered that forest conservancy has only been in existence in the Punjab for about 12 years, the actual results can only be few, but it would be the grossest fallacy to allege that we have no sufficient ground to urge the importance of conservancy and reboisement works, because the conditions in which we are placed do not enable us to point to fully successful remedies.

Accomplished evils are only too common; their remedy has as yet only commenced.

We must rely on the known facts of science, on the experience of other countries, on analogy, and on influence from works as yet only beginning to show results. It may be urged that in such a case there is only a probability of success if measures are undertaken; that may be so, but at any rate there is a great deal more than a probability of mischief if they are neglected.

The 23rd question, chapter I., consists, in fact, of a series of questions; and it is only possible to exhibit answers to each paragraph separately:—

(*a*.) *Has there been within the historic period any sensible denudation of the forest in, or bordering on, your province? Can it be tested by statistics showing over how much area forest or scrub jungle has been cut down?*

In the present state of the country it is not likely that statistics will be available, though, if any useful purpose could be secured by it, with a great deal of labour a sort of estimate of the area of hill ranges more or less denuded might be made.

The facts (or otherwise) of denudation may be tested in the following ways:—

(1.) By the tradition of the country and evidence of old people who recollect a former state of things.

(2.) By a study of localities now denuded, and comparing them with similar localities which, from situation or other cause, have escaped denudation.

(3.) Supplemented as to (2) by the fact that there has been an enormous increase in the demand for wood both for fuel and for construction, which supply is known or certainly inferred to have been drawn from places now denuded.

I have no doubt whatever that throughout the Punjab the denudation of forests has been great and continuous. We have only since 1864 endeavoured to combat it, and that with very imperfect means, and in the face of an opposition which has been and is constant and unrelenting. This is always the case, especially in the beginning of any attempt to conserve, because the great bulk of a population (whether Indian or European) are sensible only to the pressure of immediate wants, and have no idea of individual restraint for the benefit of the whole, or of present restraint for the sake of a continuous supply for the future.

There is ample tradition to show that the outer Himalaya, the Salt Range, the Pubbi Range in Gujrat, the outer hills of the Sivalik,* and many other places were better wooded than they are now.

This tradition is amply confirmed by the fact that these localities bear all the signs of its truth; while we know that practices of burning and indiscriminate

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* See remarks at the close of this reply by Mr. Coldstream, Deputy Commissioner of Hoshiárpur.

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Mr. aden Powell.

grazing (practised increasingly with an increasing population) are adequate to produce the disastrous change.

Moreover, the constant wars which before our rule desolated the country cannot have been without effect on the forest. And the immense increase of the population, the demands for railways, for workshops, for cantonments, and for towns that now number thousands instead of tens of inhabitants, and are supplied with fuel and wood from somewhere, must necessarily tend to denude the country, unless measures for reproduction are adopted. These measures have been and are still wholly inadequate to replace the drain on the material.

Within my own time enormous areas in the plains have been cleared of fuel to supply the railways, not the least part of whose demand is for the burning of millions of bricks used in the first construction.

Mr. Coldstream, Deputy Commissioner of Hoshiarpur has proved that the same effect has taken place in the Siwaliks. The destruction (chiefly from similar causes) in the hills, notably in Hazara and Rawalpindi, has been great. The denudation has no doubt been greater in our own time than at any other, because population before was scantier; there were none of the present great centres of demand; and it needs no argument to establish that, the scantier the population and its cattle, the less are the obstacles to the natural reproduction of material taken from the forests.

(*b.*) *Can you state any specific facts which lead you to think that such deforestation has caused injurious effects in any way, either in respect to the fall of rain or the abundance or permanence of water in stores or wells or the subsoil, so as to render it unfit for cultivation?*

This subject must be approached apart from the known fact that such evil results are produced by forest denudation both in tropical and temperate climates; but it is impossible to exclude the absolute evidence of facts, the state of the Department des Hautes Alpes, the valley of Dévolny, and the region of Embrun, to say nothing of the numerous instances cited in various authors in which the effects of forest denudation are known and recorded. In tropical countries, so far from there being any feature which renders it possible that results would be otherwise, the increased violence and duration of our rainfall can only tend to intensify and make more alarming the results which follow.

Every part of our hill districts where there is any population (*i.e.*, out of the truly Alpine region) is more or less ravaged by torrents. Near Chumba (to take only one instance), and on the route from there up the Siúl valley, torrents after torrent may be noticed; dry in the summer, but in the rains coming down with fury, bearing down masses of stones and débris which spread out at last into a vast cone or fan shaped mass of débris; this, increasing in breadth year by year, destroys fields on either side. The same may be observed all over Hazara, valleys that might be fertile and cultivated being filled with stones as far as the eye can reach.

Some of the disasters are, of course, due to landslips and to peculiarities of geological structure, and to accidental closures of the course of a stream, where, after the water has accumulated for a time, the barrier is violently burst, and a destructive flood follows.

But making the fullest allowance for these cases, the number of instances that have come under my own observation certainly due to, or subsequently aggravated by, forest denudation (and even denudation of herbage and turf by burning and over-pasturing—a matter also of the highest importance) are very numerous.

A familiar instance may be quoted in the Tirth valley, or that part of country traversed by the road from Simla to Sultanpur, between say Menglaor and Lárgie.

The state of the "chos" or sand torrents of Hoshiarpur ought not to be entirely unnoticed as another instance. I have specially reported on these curious torrents. The extremely soft nature of the soil of the hills would always render it liable to some detrition, and the streams would always exhibit sandy beds; but their present extent and their constant increase in length and breadth is certainly due to denudation, the evidence of which is conclusive.

The torrents that intersect the Salt Range, and bring down masses of stone and sand, may also be alluded to. The torrents called "Uj," "Rawal," and "Leh," which cross the road between Murree and Rawalpindi, are also mainly if not entirely due to denudation And I have directed a further more minute inquiry into the "basins of origin," so as to get permission to enclose these as forest lands. The destruction caused by the torrents is only too well known. A recent exploration of the sources of the well-known Chakki torrent near Gujrat showed that the main branches contributing stones and waste material came from hills utterly denuded in Cashmir territory.

The Gaggar is another familiar torrent flowing from denuded hills. There are evidences in Bhawulpur (detailed in the introduction to the Government of India Forest Report, 1872–3) to show that permanent rice cultivation, not derived from the Sutlej, was once there practised; and there is little doubt that the Gaggar was once a steady flowing river carrying fertility far south.

We have of course no statistics to show the area of land rendered unculturable by these streams, whose principal effects are seen to-day in the demand they make on public funds for repairs of roads and bridges, &c.

A great many of them have been so long in action that we can only point to lands now covered with stones without our being able to recall a day when they were otherwise.

As regards that part of the question which relates to rainfall, I would briefly observe that, while experiments carried on in Europe show a probability (and a strong one) that forests may have an influence in actually increasing the rainfall, we are as yet (even in Europe) unable to speak confidently, and in India data are wanting. To suppose that forests can create a monsoon is unreasonable; to suppose that they can attract and help in the condensation of clouds is by no means opposed to a sound judgment. But the practical conclusion is, that while we are waiting for confirmation of the effects of forests in this direction, we are amply justified in taking action regarding forest conservancy and reboisement by the other facts which no one disputes, viz., those concerning the supply of water in streams and wells, the safety of the surface soil on the hills, the prevention of destruction of lands, river banks, and what they support, as well as of bridges and public works, all of which can to some extent be secured by taking care of the slopes from whence the water (which does so much mischief or so much good, as the case may be) first takes its start,

The effect of forests in breaking the force of the fall of rain, absorbing a large proportion of the water, and acting as a filter and as a sponge, both to cleanse and slowly discharge the surplus, are too well known to be remarked on; but in connection with this I should like to say that I believe (with Mr. Medlicott) that the production of "Reh," which we call "Kalar," so deleterious to culturable land, is in no slight measure connected with the interference with the general system of subsoil drainage which must result when the outer hill ranges of a country are denuded, and when the rain that falls abundantly on them every monsoon is not enabled to soak into the soil and to feed permanent springs and streams, but is allowed rapidly to run off the surface carrying stones and sand into various torrent beds which, rushing with great violence for a time (which might be calculated at a few hours out of the whole season), pass away and

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leave nothing behind. In a word, the effect is to substitute a surface drainage, violent as well as useless in its action, for a deeper percolation of water, affecting gradually and permanently the subsoil.

I can do no more than allude to the numerous remains of old villages and wells, long deserted and dry, which are found in parts of the Punjab plains. No certain information can be given; while the desiccation may be due to the deprivation of subsoil moisture, there is also the probability that changes in the course of the great rivers, and their recession from the vicinity, may be a more immediate cause. As regards the area rendered unfit for cultivation, the area in Hazara alone of torrents beds amounts to something like 80,000 acres; but the area covered with sand in Hoshiarpur, and otherwise injured all over the country, cannot of course be stated in figures.

(*c.*) *Can you adduce any direct evidence that such injury as you think has been caused by the clearing of forests has been remedied by its reproduction?*

In a province where (beyond enacting a few tentative and general rules to save standing trees in certain places) little or nothing had been done previous to 1864, and whereas since then a small forest staff has been employed which had everything to learn, and to make its way slowly against every kind of difficulty both from within and from without, it is not possible that extensive results can as yet be quoted. We have as yet made one large artificial plantation, covering about 12 square miles, and no doubt this has produced locally an increased dewfall and some change in the local temperature. As to the effect of measures of natural conservancy, *i.e.*, giving protection (without artificial planting), all that I can say is, that the natural reproduction (when we have have been permitted to protect areas) has been such as conclusively to show the good effects of mere protection. A small but interesting experiment (not under the Forest Administration) may be seen at Rawal Pindi, where a piece of hard clayey soil with a few shrubs or bushes (of about 500 acres in extent) is now a public park full of verdure, and that solely by* the effects of careful protection for 15 years. And there are many individual tracts of forest, where-ever there have been constituted forests, all over the Punjab, which show the same results. While water in the streams may be found in many of these all the year round, similar watercourses in denuded places will be found dry.

Numerous instances may be met with in the hills of ravines closed up and cured by the spontaneous growth of bushes, &c. where from some accidental circumstance they have had the chance of growing up again.

(*d.*) *If you think the clearing has been injurious, what steps would you propose to take towards reboisement? Should it be done by artificial planting or by conservation of the tract.* * * * * *Which of the two methods would be easiest, cheapest, quickest of the operation, and most effectual?* [*I leave the omitted words regarding "vested rights" to a separate answer.*]

The difficulty, of course, is the magnitude of the work. But this should not cause despair. We cannot close the whole extent of vast ranges at once, or supply an enormous forest staff to supervise it. We must do the work gradually. We must attack successively, and slowly, one by one the points where the denudation has produced the worst effects. We must be content to take (in each forest division) a few only of the principal points, and assure ourselves of success. Prejudice may be removed best (as directed in the case of the vast work to be done in the Alps under the French law) by attacking places where the results will be seen at an early date. We should take, for instance, certain parts of the salt range, the sources of one or two definite and destructive torrents in Hoshiarpore, in Rawalpindi, and so forth, and be content to treat these. If we accomplish so much, and leave succeeding generations of officials to carry on the work, we shall have nevertheless done a great work, and saved thousands of rupees.

The first and most essential step is, having selected a definite boundary line along a range of hills selected for operation, or a definite "perimeter," that is, the area from which the ultimate branches and sources of a torrent take their rise, most carefully and completely to close and protect it, so as to give every possible chance to its natural restoration. All experience shows us that this (in a climate like that of India, where growth of vegetation, once allowed a fair chance, is rapid) is the most promising method of proceeding.

Whether we adopt artificial planting or rely on natural growth, this is the first thing (and an absolute sine-qua-non) to be done.

This leads me to the next point; there is no hard and fast rule to be laid down in any case, whether natural or artificial reproduction is to be adopted. The result of natural growth has to be watched. In most cases it will require:—

(1.) Closing and rest.

(2.) Certain mechanical aids known as "barrage," or series of rough dams made of rough stone (or what else may be available) built in a series one above the other, to aid the closing up of ravines; as fascines pegged or staked on to the soil; as rows of live stakes driven firmly into the ground, and made of willow, poplar, or other species that strike root readily, so that each stake becomes a tree; cutting of gently sloping gutter or drains to lead off the water, and prevent it concentrating its flow into a dangerous ravine, thus also dispersing moisture, and rendering the hillside soft and damp, so that sowings may be made or cuttings planted along the edges of such drains or channels.

(3.) Sowing, or filling by transplants, of beds silted up or other suitable places at the heads of streamlets and natural points of drainage collection.

Of course natural production is the cheapest, and, when aided as above, may be just as quick and effectual, if not more so, than purely artificial work; but most ordinarily both will be used in combination, and the precise form to be adopted must entirely depend on the physical conditions of the place dealt with.

(*e.*) *Can the conservation be effected without interfering with any vested rights of the people, or with their consent, if necessary?* [*These words occur in the middle of the last quoted question; but are conveniently separated.*]

As far as consent is concerned, experience can alone show. In the Alps it has been found that when Government commenced the works on areas which it took up compulsorily, as soon as people saw the success attained they began (especially the more rational communal councils, &c.) to do the work in their own neighbourhood themselves and the Government aided in such cases by money grants or grants of seeds and plants. The areas or "perimeters" necessary to be dealt with were declared by forest experts, and the work was carried on by the State or by the "reboisements—Facultatifs" alluded to.

In talking with people in Hoshiárpur I find that those whose lands were affected by the sand were eager that Government should take steps, but the

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* Of course roads have now been made, and avenues, trees, &c. planted, but the bulk of the growth of *Acacia Modesta* which covers the slopes is entirely natural growth.

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aden Powell.

people in the hills who had cattle said it was very true that the case was bad, but that their cattle would die. I said, "You can feed your cattle on "fodder, and you can take your cattle elsewhere if "the worst comes to the worst, but we cannot make "the land safe or reproduce grass and wood (which "will ultimately, after a little space of self-denial, "benefit you) except by closing the hills."

The idea that any peasantry will ever consent at first to anything the benefit of which is future, while the pressure or discomfort is immediate, is contradicted by the experience of all forest countries. By rewards and by compensation you may reconcile people, and that is all. Government must judge what is right and fair to do, irrespective of popular clamour, and their orders must be carried out. The natural love of keeping things quiet, almost at any price, renders officials very unwilling to do this.

But next, as to amount of restraint necessary. The practical difficulty is that, the worse the denudation, the larger is the area over which cattle are spread, searching out the last blades of grass and the last sprouts of shrubs and plants for their scanty subsistence. Generally speaking, however, the locality is of so little use to the people that the actual hardship can be very little if they are deprived of the right to devastate it for a time. Liberality must be shown, and compensation paid where needed; and effort should be made, in all reboisement works, to grow quickly not only trees and shrubs, but above all grass, plants of fodder, and so forth, such as the medicago and other species, which after some months may be cut, of course without up-rooting, as fodder, and given gratis to people that have been excluded. But I beg to call attention to two prominent points the justice of which is undeniable, but which are apt to be overlooked.

1. However much A. and B. may have "vested rights" of grazing, they are not the proprietors of the soil.* Consequently they can never claim to exercise their rights to such an extent as to destroy the servient estate, or render it useless to the proprietor. All rights are inherently limitable to this extent. Hence the soil owner has the natural right to say: "The land is incapable in its present con"dition (without total destruction) of supporting "more than such and such a number of cattle. I "require that the cattle admitted should be limited "to that number which it will fairly support, and "I require that places which are in such a state "that they cannot support any cattle at all should "be closed, so that my property may be restored, "and not rendered alike useless to me and a source "of injury to others." Such a principle is admitted by every civilised law, and I could quote ample authorities (if for anything so obvious it were needed) alike from English, French, and German sources.

2. But if there is an absolute conflict between the private and the public interest, the private must give way. It is more reasonable that 10 or 12 cattle owners should be obliged to take their cattle away and grow fodder for them, and feed them in stalls, or even sell them, than that miles and miles of country shall be destroyed by the denudation of the "perimeter" or basin of origin of a hill stream.

The closure, it may be remembered, is only temporary; after a few years (may be under favourable circumstances four or five only, but of course no fixed estimate can be made) partial reopening may be allowed; care has then to be taken not to allow a greater number of cattle on to the site than can really be pastured there without risk of overgrazing for the future.

The existing forest law gives ample powers, in my opinion, for carrying out the procedure necessary, but nothing can be done without a firm grasp of the principles of forest conservancy, a clear understanding of what is fair and just, and a determination to work on these lines for the public benefit firmly and with a whole heart, not to be moved by a little clamour or an outcry which is sure to be raised if listened to, no matter how intrinsically just and wholesome the restrictions imposed are.

To the above report by the Conservator of Forests, I subjoin the following account of what has occurred in the Siwaliks of the Hoshiárpur district, written by the Deputy Commissioner, Mr. Coldstream:—

There has been within the last two generations a most extensive denudation* of forest area on the outer Siwalik, the chain which runs from northwest to south-east right through the whole district in the direction of its greatest length.

I cannot give complete statistics as to the area of denudation, but have been at some pains to ascertain generally its extent within each hill village.

The result is, that it appears that miles upon miles, I might say tens of miles, of hill side have been cleared more or less completely of their timber and brushwood.

Where formerly the nílgái, the tiger, and even the elephant were found, there is now no forest, not even in some places a scanty brushwood.

This deforestation has had the most disastrous effects,† for I think I may safely attribute to it, if not the existence, at least the increase, of the sandy beds called chohs, which seam the whole breadth of country from the water shed to the south-west boundary of the district. These are very numerous, occurring at almost every mile, and are sometimes themselves ½ a mile broad. These chohs are plains of arid barren land for most of the year; but for a few days each rainy season, and occasionally throughout the year, they are filled with wide rushing torrents sweeping everything before them, and carrying in a few short hours the whole drainage of the lower Siwaliks into the fertile plains of the Doab.

Loss of area in the hill villages from detrition, loss of potential forest income to the villagars, diluvion in the villages in the plains below, destruction of road, bridges, and railways, perpetual waste of sand in the midst of a moist fertile country, growing expenses of sand hills on neighbouring land, formed by the action of the winds, these are some of the evils which the chohs have caused or help to perpetrate, and which are probably intimately connected with the denudation of the forest on the outer Siwaliks.

I have ascertained that in Hoshiárpur parganah above 55 square miles (35,000 acres) are wastes of choh land.

During the period of Settlement 8,000 acres of assessed land alone have been diluviated or deteriorated by the action of chohs. To give an instance of which I know the particulars, the township of Dasuya has lost land worth Rs. 5,000 in two years from this cause.

In Jullundur district the complaints of the Hoshiárpur drainage appear to be yearly increasing, and the floods‡ from these hills have just caused enormous damage in the line of railway.

I believe that the people would generally consent to Government interference. The land is mostly the people's and not Government land; but I think they could easily be persuaded to submit to conservancy in their own interests.

Nature would soon reboise the tract, helped by sowings and plantings, which could be very cheaply done through the agency of the villagers.

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* Of course, if the dangerous places are really private land, then, unless some special application of the Forest Act can be made, the land has to be expropriated; but here we are dealing with wastes which are in theory Government, as all waste is, but which is burdened with rights.

* Denudation of hill tracts of outer Siwalik range.

† Disastrous effects of denudation.

‡ Yes. But the floods did not go over the chohs, but along the courses of regular rivers, and the damage caused to the country and to the railway was owing to the railway embankment acting as a dam from its being deficient in water-way.—
GORE OUSELY, Financial Commissioner.

Mr. Baden Pow

I need not further enter into particulars, as the subject has been fully treated in my letters above quoted.

I consider the subject as one of vital and pressing importance, and I am only waiting for establishment for which I have applied, and a general sanction, to commence operations.

Addendum to the preceding Reply.

Major Wac

The Conservator of Forests has written a further reply (which is appended), under the impression that the Financial Commissioner's remarks, with which his previous reply is prefaced, will be understood as asserting that no deforestation has occurred in the Punjab. I am, therefore, directed to point out that the remark objected to was confined to "deforestation of the injurious nature described" in the question, that is to say, deforestation carried to such an extent as to affect the rainfall or water-supply in streams and in the subsoil, or to denude the soil and render it unfit for cultivation.

The letter now received from the Conservator shows, what the Financial Commissioner never denied, that a great deal of timber has been cut down in the forests of the Punjab and of Kashmir. It would have been impossible to build civil stations and cantonments, and to carry on the public works which the Government has undertaken, without a large consumption of wood both for building purposes and for fuel. And the increase of population, and the security obtained under the British rule for life and property, together with the fostering influences produced by limiting the Government land revenue demand, have caused an immense area of waste and forest land to be brought under cultivation. But the Conservator does not, even in his present letter, give figures showing that the deforestation caused by these circumstances has produced the injurious effects described in the question.

Mr. Baden Pow

I have received a copy of my answer to the 23rd question of the famine questions, chapter I. This answer is, I observe, directly disallowed by the brief remarks which precede it.

2. Were this merely an expression of opinion, I could not, of course, trouble you with any remarks. The answer to questions must necessarily evoke many differences, but my answer is denied in such a form that the Famine Commission must conclude that it need not be read, since it is entirely contradicted by the direction of the highest revenue authority.

3. And the point is one of great importance. For the only conclusion to be drawn is that there is no need for any measures of forest conservancy in the Punjab. But, in fact, I cannot help suspecting that there must be some mistake in the text as it stands. I read with astonishment (if the expression may be pardoned) the statement that, within historic times, no extensive clearing of forest has taken place in the Punjab. It is not, you observe, the question (in the first instance, at least) whether the clearance of forest has been beneficial or necessary, or excusable even, but whether it has occurred as a fact? Now the answer to this can only be that forest has disappeared from one end of the province to the other—not by hundreds but by thousands of acres,—and it would be hardly an exaggeration to say in some parts by hundreds of thousands of acres, and that except in the limited area under conservancy a great deal of what remains is steadily deteriorating.

4. I take the case of the hill ranges only. In Hazára, your own settlement report proves the enormous increase of population and extension of cultivation that has taken place, not merely in the plains but in the hills, where it may safely be estimated that 50 per cent. of the primeval forest has disappeared, while in many considerable hill ranges the whole of the forest has been cut down or reduced to mere scrub. In Rawalpindi, I have not the first settlement report to refer to and give the exact passage, but it is stated there by Col. Cracroft that the cultivation in Murree and Kahuta did not amount to anything more than a small per-centage of the whole. At present the demarcation of the remaining forest is so difficult that you will find that you can hardly obtain any continuous or fair-sized block of forest at all. It is a sanguine estimate now to hope that the forest may prove to be 15 per cent. of the whole!

In Kulu and the Kángra hills I need hardly remind you of the wholesale disappearance of forest consequent on the extension of agriculture and the spread of tea cultivation. All around Simla the same is true; the establishment of hill cantonments has everywhere carried with it heavy demands for land for increased potato and cereal crops, and large clearances for fuel and timber supplies, all of which have made great havoc in the forest, and little or no replacement of the forest thus destroyed has taken place. It is only quite of late years that forest conservancy has received attention. In proof of this I beg to call your attention to the Board of Administration letter to the Government of India, 1852, para. 8, &c. (*Barkley's Non-Regulation Law, page* 365).

The same is true in the Salt range as of all the outer and lower ranges of the Himalaya.

5. Then also consider the enormous quantity of deodar and pine timber that has been taken to the plains during the last 30 years for civil stations, public offices and buildings, railway bridges, and for sleepers and other objects. All this has been persistently extracted, without method or system and without any sort of control, from the hill forests overhanging our river valleys, the principle of the easiest work being alone looked to. The consequence has been, in Kashmir, that the deodar forests are fast disappearing, no measures of reproduction being taken. In the hills of Chumba and Basahir (like those of Kulu in our own territory) it is only the remnants of forest that were, some 12 years ago, leased by the British Government, and which we have commenced to replant and to conserve.

6. That a portion of this destruction was necessary is not disputed. Cultivation must advance, of course, but it has advanced without due control, and often in a very wrong direction. It is not only to be considered how much land is kept as forest, but how that forest is distributed and where placed.

Nor does this alter the fact that continuous and very extensive clearing of forest has gone on and is still in progress even within our own times.

7. I altogether put aside the indirect evidence afforded by the torrents like the Gaggar, the Hurro, the Soháu, the Bhimbar, Le, Uj, Rawul, &c. The hills from which every one of these or their feeders rise have certainly been denuded within "historic times," but I prefer to rely simply on the plain facts of the great increase of cultivation and the enormous supply of timber to the plains as utterly subversive of the opinion that it is doubtful whether forest has disappeared.

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North-Western Provinces and Oudh.

Captain Pitcher.

NORTH-WESTERN PROVINCES AND OUDH.

Captain Pitcher.

Inquiries are here made :—

1*st.* As to the extent of forest denudation within the historic period.

2*nd.* Statistics of denudation are called for.

3*rd.* Specific facts in proof of injury caused by denudation are asked for.

4*th.* Extent of such injury.

5*th.* Proof, if any, that such injury has been remedied by reboisement.

6*th.* Or if injury still exists, what steps should be taken to repair it?

7*th.* By artificial plantation, or by keeping out fires and grazing and leaving the area to natural reproduction?

8*th.* Could grazing and fires be kept out without trespassing on the rights of the people, or would these latter object to trespass ?

9*th.* Which method seems most advisable on financial and practical grounds ?

10*th.* And to what extent can recommendations be carried out.

These queries touch on subjects of vast consequence to agriculture. Famine originates in a failure of agricultural operations. This inquiry is being held with a view to minimising that failure in the future; all, therefore, that touches the prosperity and promotion of agriculture is of the first importance.

Throughout question 23 runs an assumption that forest denudation and the conversion of scrub jungle into corn fields produces injury or inconvenience to agricultural interests. It does not appear to the framer conceivable that benefits may have been found to arise to populations from the clearance of forest or jungle. The replies, however, show that some officers think otherwise.

On all hands, from the forest officers of the North-Western Provinces and Oudh to the district officers of Lalitpur, Mainpuri, Etáwah, Moradabad, Muzaffarnagar, Aligarh, Kumaun, Garhwál, Fyzabad, Gonda, and the Tarái, extensive denudation, within the historic period, of forest and scrub jungle is admitted, but in no instance can statistics be given.

Nor (save with one or two exceptions) have any specific facts, as distinguished from thoughts, suppositions, and probabilities, been adduced as to any real injury resulting from such denudation.

The exceptions are the opinion of the Assistant Commissioner of Kumaun, that the rainfall of denuded tracts has decreased since such denudation took place, but on turning to his rainfall returns it may be seen that the rainfall of Haldwani, situated in a denuded tract of the Bhárbar, actually exceeds in some years that of Naini Tal and Almorah, though these stations are in close proximity to densely wooded hills.

And the Conservator of Forests, Oudh, talks of the southern exposure of the Gondáh hills being treeless, and covering the lower country with sand. The southern exposure referred to, when I saw it in 1876, was principally rock. However, as regards these same hills, I have seen plenty of timber in their valleys, and in my separate reply have referred to the excessive and wholesale denudation which is being carried on in those valleys by the Nepaulese.

Where the head of a river or stream is fenced about by forest, there can be little doubt but that the forest should be maintained, so far as it may be found necessary to maintain the stream.

Several district officers state positively that denudation has not been followed by any injurious effect, while those of Garhwál, Gonda, and Moradabad go further, and point out that denudation has been, from a sanitary point of view, beneficial. From the Tarái comes a proposition for further denudation, and it is notorious that cultivation in the Tarái only became possible when the jungle had been cleared to a considerable extent. The Commissioner of Kumaun, the Deputy Commissioner of Gondah, and the Deputy Commissioner of Lalitpur all intimate that they could spare part of their existing forests for cultivation, and the forest officer even of the Eastern Dún goes so far as to recommend further clearance with a view to rendering that part of the country more fit for man's habitation than it is at present.

The Conservator of Oudh admits the profit from a sanitary point of view of deforestation carried on outside of reasonable limits, those limits being the boundaries of his present forests.

The Deputy Commissioner of Kheri admits great evils from excess of forest and jungle, but considers that the benefits of forests outweigh the evils. He does not, however, supply the quantities of the equation.

As, then, denudation would appear to have taken place to a considerable extent without ascertained injury resulting in any instance, while ascertained benefit has resulted in more instances than one, it seems unnecessary to remark further on the remaining paragraphs of the question or to go into the merits of artificial or natural conservation, save to point out that the only district officers who venture opinions are distinctly averse to conservation when carried out at the expense of abrogating those privileges of grazing and rights of way which the dwellers in the neighbourhood of forests, and their forefathers for generations past, have hitherto enjoyed undisturbed. They seem to think that right of way, of common, and of pasturage, which the people of England are able to enforce even in the present day in a forest so little deserving of the name (compared to Indian forests) as that of Epping, should, if a just right, be conceded without demur.

The officer in charge of Tarái, and the Secretary to the Famine Committee, have, to a certain extent, travelled beyond the record in expressing their opinions that decentralisation of the Forest Department is a measure urgently needed, and that the best interests of the country would be served by trusting local Governments to manage the forests for themselves through the Revenue Department; but if these expressions of opinion will only lead to the suggestion receiving serious consideration, the new departure will not have been taken in vain.

The opinions of the forest officers submitted with reference to question 23 are, as a rule, merely repetitions of the axioms of the Forest Department, and, as the Conservator of Forests, North-west provinces himself remarks that "he fears the information will not be of much value," I may pass them without further remark, save to point out that the rainfall returns of Ránikhet for seven years, given by the Deputy Conservator in proof of the beneficial influence of conservation, exhibit characteristics of rise and fall similar to those of other districts in the North-Western provinces and Oudh for the same years.

The Deputy Commissioner of Jalaun, in replying to the query regarding past famines, states that no famine has been known since 1837–38, and under question 23 he states that there have been no forests in Jalaun "for centuries."

Regardless of cause and effect, he goes on to propose the perpetual alienation by Government of the land revenue on three acres in each estate on which zamindars are to be given takávi for raising forests. From other figures in the report this would amount to the abnegation by Government of some Rs. 60,000 a year. As the formation of forests is only interesting to the Famine Commission in view to the prevention of famine, a calamity from which

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Captain Pitcher.

Jalaun is already comparatively free, the proposition can scarcely be supported.

The Deputy Commissioner of Jhánsi rests in doubt as to whether the stony and barren condition of parts of his district (said formerly to grow sugar-cane, but date not given) has been brought about by forest denudation or by the destruction of ancient works for irrigation; on these doubts no opinion can be formed. This phenomenon of old sugar mills being found in places where sugar-cane has never been known to grow occurs elsewhere, and is perhaps due to the people setting up mills and expecting from the experience of one favourable year that sugar could be profitably cultivated ever after. It costs as much to move an old mill in some localities as to set up a new one.

Captain Campbell.

Naini Tal.—There have been large clearings in the Kumaun Bhábar; at present about 100,000 acres are cultivated there, the greater part of which was forest 30 years ago. In the hills very large clearings have been made, and many are going on still, I believe.

(3.) I think it is well known that deforestation must have an injurious effect on the pemanence of water in streams and springs. I have no means of knowing whether the actual fall of rain has been affected or not, but it seems probable, as the annual rainfall at Almora, where there is little forest near, is only about a third of that of Naini Tal and half of that of Ránikhet. I have repeatedly heard natives of these hills say that where formerly there was enough water to turn a mill there is difficulty now in getting water to drink. I cannot say much regarding the denudation of the surface soil, but with the heavy rainfall usual in these hills I feel sure that denudation must largely take place unless the ground is terraced as soon as the forest is cut down; but I believe such ground is first generally cultivated as "kil," and very gradually terraced.

Major de Montmorenc

Bahraich.—*Sub-answer* I.—*The Bahraich forests lie along the Nipal frontier. They have an area of 281 square miles.† Besides them, but not belonging to Government, are the Ikauna jungles, which run in a belt 20 miles long and three miles broad.

This tract has no timber of any value, but it affords capital grazing grounds and fuel supply for the villages around. I am not possessed of information as to "over how much area forest or scrub jungle has been cut down." But it is matter of notoriety that within a comparatively recent period large clearings of scrub jungle have been made. The Conservator of Forests will no doubt have been able to procure some statistics, as this is one of the few subjects in the long list of the Famine Commission questions on which he has to report.

III., IV., V.—I do not think that any deforestation that has yet taken place has caused harm in any way, or has lessened the rainfall in any degree injurious to agriculture in this district. Indeed, what clearings have yet been affected have operated to make the climate of Bahraich more salubrious.

VII., VIII.—These questions lie at the root of forest administration. There can be no doubt that either the rules of the forest system, or the manner in which they have been worked, or both, have pressed severely upon the villagers, who, under native rule, were allowed, or at any rate managed to enjoy, privileges which are now curtailed; and I am strongly of opinion (and I have an experience of six years and half of service in Tarái districts) that justice and expediency demand a relaxation of the rules, and more liberal concessions to the villages neighbouring the forests, especially in regard to grazing and the assignment of light timber for hutting. Some of the most cherished traditions of the Forest Department have been recently challenged in a startling manner by Captain Pitcher; and though I can hardly believe with him that periodical fires are not really injurious to forest conservancy, yet there seems much to be said on his side of the question. I incline to the belief that the outlying parts of the forest should be freed from some of the restrictions which now attach to them, but that the inner portions might be enclosed and worked with more strictness than has hitherto existed. The administration of the outlying parts ought to be controlled, if not wholly, at least in a great degree, by the Deputy Commissioner, who should have an additional assistant to aid him in place of the second forest officer, who I learn is to be appointed to this forest division.

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* Taken in part from Settlement Report.

†		
Bhanthapur forests	13	square miles.
Dharmapur forests	173	"
Chakia jungles	21	"
Charda jungles	13	"
Bhonga forests	61	"

Captain Wood.

Oudh.—The sál forests, usually occupying a high dry light sandy soil, not being so suited for cultivation of cereals as the low and damp forests chiefly occupied by dhák and miscellaneous soft wood trees, have suffered less than the miscellaneous forests. The sál forests have suffered more from ill-treatment and from graziers' fires, being more damaged than denuded. In Pilibhít and Puranpur there were extensive forests of sál now mostly degenerated into scrub.

The Bhira forests are now simply forests of poles in the Bhúr iláqua, on the right bank of the Soheli. Cultivation has cleared away a lot of miscellaneous forests, and also near Singhai (Khairagarh) a good deal of miscellaneous forest, huldu and dhák, has been cleared in the last 15 years. The next clearing is near Motipur, in the Bahraich division, between the sál forest and Chota Surju; the dhák trees still remain, uncut (for lac), but the miscellaneous forest has been cleared away.

I believe that the continuation of the Chukka and Chándi forests extended far south. In Bahraich and Gonda the forests remain just the same as formerly on the north of the Rapti, but there is no doubt that much forest, even sál forest, has been brought under the plough south of it. Here the mhowa (for flower and fruit) of the original forest is allowed to remain. The same has been done in Gorakhpur, and is still being carried on; the Government forests will soon be the only forests remaining. Colonel Sleeman mentions large jungles in districts, other than Kheri, Bahraich, and Gonda, the only districts in Oudh that I have forests in, not mentioning a few patches in Hardoi.

With regard to the border, I believe a good many mango groves have been cut for railway fuel along the line of the East India Railway, and that forests also in Mirzapur have been cut down.

I think the only damage has been done in the Bhábar forests, in Tulsipur (Bahraich and Gonda), P.I.Qn.23.

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Captain Wood.

where lopping trees and thorns (for grazing) and overfelling in sál forest has allowed the vegetable mould to be washed away from the service soil. On the hills too, owing to the constant burning (the hills are in Nipal now) on the southern exposure, there is no tree growth to speak of, and the rains rush with violence over the country, covering the country near the nálas with sand.

This injury is confined to the country at the foot of the Bhábar; there is either too little or too much water.

The only thing that I can state is that Mr. Carnegy, who has been in the Bhira forest for many years, last year told me that he had noticed that the Kutna, which before used to be dry for long distances, except at the deep places where there were pools, has now a perennial stream, and the forests on the banks have been protected some five or six years; only partly protected, cutting prevented. I believe the water in the Jowra (Khairagarh) forest is becoming more regular in its flow.

The groves of Oudh are, I believe, increasing. What I consider would do good to the provinces of Oudh and the North-western provinces would be increasing the groves and plantations in those parts of the North-Western Provinces, Panjab, and Rajputana that lie to the north-west of the provinces—roughly speaking, the right bank of the Jumna—and also protecting any remains of scrub forest that remain, whether on the hills or plains, as these would act as a tattie; at present a good deal of the moisture from the trees in Oudh is probably carried on in the hot dry season to Bengal;—and the encouragement of tree plantation generally. I would advocate the keeping of as much grass lands as possible in the hands of Government, preventing the breaking of it up for cultivation, as these grass lands yield grazing when the cultivated fields will not yield karbi or bhusa, and it is in famine years that the grass lands have the greatest strain on them.

Mr. Ross.

Dehra Dún.—There can be no doubt but that the total prevention of fire would regulate the supply of water to the rivers very much. Now, by the continued burning, the hill sides are hard smooth surfaces, and the water simply rushes off. It does not even penetrate the soil, such as it is. If there were no burning, there would be a mass of roots and moss, which would increase year by year, and would form a soft spongy substance, which would retain the water for a long time. Thus excessive floods on the one hand would be to a certain extent prevented, and, on the other hand, a good supply of water would most certainly be kept up for a long time.

As somewhat bearing on this subject, I may mention what a difference it made in some rivers in Scotland allowing the water to run off freely. The feeding grounds of the river were hills used for sheep grazing, and were much too wet, rank moss and rushes growing in many places instead of heather or grass. This is, of course, very different to the Himalayas, but still the principle is much the same. The hills were intersected by main drains, open ones, cross drains, and drains of all sorts. The result was that, whereas before the drains were cut, when there was heavy rain in the hills, the rivers rose gradually and kept up for some days, and there was first-rate fishing. When the drains were cut, the water rushed down all at once, filled the rivers with filth, and ran down in two days, and there was no fishing. In the same manner, if the rush of water on the Himalayas is impeded by grass and roots and vegetation generally, the water supply of the river will be regulated much better.

But is it possible? In the first place, the tracts of Jaunsár Bawar, or all British territory put together, is but a very very small portion of the gathering ground of the Jumna and Ganges. Would it ever be possible to make the rulers of independent states stop burning? Secondly, how about sheep and cattle? There would be a loud cry of discontent; all the hill men would declare they were ruined, &c., &c. If burning were prevented in our hills and not in independent territory, the residents of our hills would certainly fly to the land not burned. There would be no great loss, but still Government does not of course wish to force them to any such action. For actual grazing, I myself do not think burning is absolutely necessary. It improves the grazing and it brings on the young grass earlier, but I think the sheep, &c. could get on well enough without it. In all the hills where there is heavy snow the old grass is laid, and it takes some time for the young grass to shoot up; but it does shoot up eventually all right, and is really better grass than the grass on the burnt ground. Burnt ground would be ready for grazing fully a month earlier than unburnt ground. This month's delay would of course be great at the worst time of year (in April and May); still I am quite convinced that, by keeping their herds low down, and at that time of year they usually do so, the people would get on well enough. The people themselves, one and all, say they could not possibly, and that all their sheep, &c. would die. I don't think so.

There is, however, one more difficulty; and that is, that insect life increases very much more rapidly in unburnt than in burnt land. The people say that, if the grass were not burnt, their sheep would get so full of vermin they would die. They say the vermin, tick, &c. would fill up their ears and render their life so miserable that they would die. There is something in this, but how much exaggerated I cannot say. Of course, if they could afford to tar their sheep or rub them occasionally with deodar oil, it would keep off all ticks, &c. The Forest Department has heaps of chips, roots, slabs, &c., &c., which would make enough deodar oil for the whole country. If depôts of oil were kept, and the oil given out free of cost or at a very slight cost, the insect difficulty would be got over.

5. The Jaunsáris do graze a great deal in unburnt lands in Jaunsár Bawar. They say they only graze in high-lying unburnt land, and that the cold there keeps down vermin; they say if the low valleys and khads were not burnt, that the sheep could not go into them. I do not think there are any villages that graze entirely on unburnt land.

6. Some people argue that, because burning is necessary in Scotland, therefore it must be necessary here. This is nonsense. Grass land is not burnt in Scotland, except by accident or now and then because the proprietor has a fancy that way. The land that is burnt is heather land. If it were not burnt, young shoots would not be thrown out; all the strength would go into hard useless wood. This is not the case with grass, which grows up afresh from the root each year.

7. The conclusion I come to is—

(*a.*) That unless you can prevent burning on the great mass of the gathering grounds of the big rivers, there would be very little use doing anything.

(*b.*) That it is quite possible for sheep and cattle to live and thrive on unburnt lands, so far as food is concerned.

(*c.*) That I am not in a position to say how far vermin might increase and might harm sheep, &c. in unburnt lands, but I am sure that if deodar oil were given free to grazers no harm would accrue from vermin.

BENGAL.

BENGAL.

Mr. Toynbee.

No statistics are available to show the area of forest or scrub jungle which has been cut down. The pressure of the population on the soil has, by gradually extending the margin of cultivation, caused the destruction of nearly all scrub jungle in most parts of Bengal, and it is not generally met with now except in the hilly and thickly populated border tracts of Orissa, Chota Nagpore, and Chittagong. There can be no doubt that in former times a very much larger area was under forest in British territory as well as in the adjoining Nepal territory than at the present time. From what we know of the latter, clearing of jungle has been carried on steadily of late, partly for extension of cultivation and partly for the export of timber to British territory. In Behar there are unmistakable signs that extensive jungles existed in former times, while, in the present day, only remnants of these are met with along the edge of Behar, as, for instance, on the Kymore hills in the southern part of Shahabad, along the southern boundary of the Gya district, in the Sonthal pergunnahs, and probably also in North Behar along the Nepal frontier. In the Behar plain itself almost all forest and jungle has now disappeared, forest growth having been reduced to mango groves scattered over the country. And even the latter seem to have been indented upon more heavily of late than in former times, owing to the demand for opium and indigo boxes.

The effects of forests on the water-supply are two-fold:—

(1.)—They reduce the temperature of a country, and consequently increase the probability of the vapour suspended in the air coming down as rain or fog; and,

(2.)—They regulate the supply of water.

In a denuded country the rain water runs off at once, and collects in the streams within a short time, causing them to rise rapidly, and is carried away to the sea. Land covered with forest, on the other hand, retains a large portion of the rain water at the outset, and gives it up again by degrees, thus causing a steady flow in the rivers instead of a sudden rush of short duration. The effect of forest growth mentioned under the first head tends to increase the rainfall; that mentioned under the second supplies a regular flow of water for irrigation and other purposes, besides preventing deterioration of the soil, consequent on sudden floods. This being the case, denudation, which doubtlessly has taken place in Behar by slow degrees, must have affected the rainfall and water-supply. The question then arises, what steps should or can be taken to remedy the evil effects? In answering this question great difficulties present themselves. In the first instance, the Government of India cannot prevent deforestation in Nepal; secondly, Behar is for the greater part a densely populated country, in which Government does not possess any lands worth speaking of. It may, however, be possible to counteract the evil effects to some extent in the following manner:—

(1.)—By causing a fair proportion of the area along the northern and southern edge of Behar to be kept under forest.

In the southern part of the Sasseram district Government has reserved an area of about 30 square miles, but it is believed that it might be possible to increase it to at least 100 square miles. To make up this area the hilly parts of the country, the Kymore range, which are of very little or no value for cultivation, should be selected. Similar steps might, perhaps, be taken along the southern hilly edge of the Gya district.

The northern edge of Behar, along the Nepal frontier, is only sparsely populated, and it would not probably be very difficult to obtain certain blocks for forest purposes, or cause them to be kept for such.

(2.)—The planting of mango and other groves throughout the province should be encouraged, and their destruction discouraged.

Wherever such is practicable the planting of trees should be enforced, and where the Government cannot interfere in this direction the planting might be encouraged by district officers. For this purpose nurseries might be laid out at the head-quarters of district officers and their subordinates, from which seedlings should be distributed. A good deal could be done in this direction if proper energy were brought to bear upon the subject. As regards discouraging the destruction of mango groves the Government may do a good deal. First of all, the use of mango boxes for the packing of opium should be stopped. Considerably over 100,000 cubic feet of timber are now used annually for this purpose at Patna, for which, of course, the finest mango trees are cut down. There will not be any difficulty in obtaining the necessary timber from the Oudh forests until the forests on the Kymore range and in Palamow are capable of yielding the supply.

The Government could further do a great deal of good by preventing local trees being cut down for fuel for brick burning wherever large public works, for instance, railways, are constructed. A good deal of damage may be done in this way. Whenever coal can be produced at a reasonable price engineers should be prevented from using local fuel for the sake of a paltry saving. The great mass of the people of Behar use cowdung to a large extent for their own domestic fires, but when they can obtain a few pice by the sale of firewood they do not hesitate to sacrifice their trees. It would be a grand thing for the welfare of the people if they could, by degrees, however slow, be brought to use manure for the improvement of their fields instead of burning it. One of the great obstacles in this direction is, of course, the scarcity of fuel in many parts of the country, and consequently every tree planted would help towards the object in view.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Captain Doveton.

Since 1860 any denudation that may have taken place in some part of the provinces is believed to have been almost counterbalanced by improvement resulting from conservation in others. At any rate, the change in this respect has not been anywhere sufficient to cause any appreciable effect on climatic conditions.

If the forests themselves be appealed to, there is every reason to believe that within the past 150 years the forests of these provinces have much deteriorated, and that the forest cover has been considerably reduced. I refer especially to the portion of the provinces lying north of the Nagpur extension of the Great Indian Peninsular Railway, and bounded on the east by Rewa state, the Mandla district, and the River Waingaga. Within this area trees are here and there to be found that could scarcely have acquired the form they have, had the conditions of forest growth not once been more favourable. Here and there also remnants of bambú forest are to be found. The presence of bambú in these cases indicates the existence at some time of a richer soil than is now to be found, and the existence of better soil in such

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CENTRAL PROVINCES.

Captain Doveton.

localities (the slopes of hills) indicates the pre-existence of a better class of forest. That there has been a vast diminution in the area under bambú (in itself a most perfect cover to the soil) I am firmly convinced; and I am inclined to attribute it to the pre-removal of the cover of trees. The bambú impoverishes the surface soil and gives a dense cover during the growing season, and on the trap hills young plants of this species must be so weak as to render the escape from forest fire or even a severe hot season extremely improbable. Thus it would appear that reproduction is chiefly from general seedings when the entire old crop dies off, and if at this time there is no tree-vegetation to shelter the young plants after cessation of the first monsoon there is little chance of any surviving. This opinion is not mere conjecture, but is the result of carefully observing the conditions under which reproduction has taken place on more favourable soils. Considering that the forest tracts of these provinces vary from rich forest to scrub jungle, any statistics regarding areas under wood could furnish no possible idea of the cover on the land, and would therefore, even if available, be useless.

Its Effect.—On this point it can only be stated that the existence of sál round Kiowli in Bijiragogarh seems to point to a time when there was a heavier rainfall than at present—while in the Wardha hills there are one or two old village sites, the names of which I cannot at present recall, the desertion of which is probably due to failure of the water-supply.

The rainfall registered at Kitowli during a comparatively heavy monsoon, that of 1874, was 52 inches; but this is the only record of rainfall at this place. Though I mention these two circumstances, I am by no means prepared to assign the supposed decrease in rainfall or diminution in water-supply to forest denudation, though they may possibly result from it.

Forest conservancy is of too short standing to admit of evidence being produced on this point, but that thoroughly well-stocked and protected forest must gradually tend to improve the water-supply in the vicinity of such forests is a point that does not admit of doubt.

The present rainfall and water-supply in the provinces is good, and for the maintenance of this supply the gradual but steady extension of forest conservation now in progress appears to be all that is required. Government has at its disposal a large forest area within which conservation can be effected without interfering with the rights of individuals. In some cases the acquisition of land for this purpose may be found necessary.

Extraordinary expenditure on restocking artificially does not appear called for except where there is a prospect of such undertakings proving directly remunerative.

BERAR.

Mr. Ballantyne.

BERAR.

"There are no certain facts within my knowledge as to the decidedly injurious effects of denudation. A register of the rainfall has only been kept for recent years since conservancy has been commenced, that is, since 1866; the data for times anterior are wanting, hence it is impossible to speak with any assurance. Our registers, as far as they have gone, show, however, that the reserved area gets a larger rainfall than the tracts without the forest, *e.g.*, for the current monsoon* the fall at Chikalda (outside our forest reserve) has been 54 inches 19 cents, and within the reserve the fall has been 65 inches 52 cents, taking the average of the registrations at Malka, Pili, and Raipur, points situated at a distance from each other, but all within the reserve. Whether this greater fall is entirely due to the presence of the jungle and conservancy, it would perhaps be rash at the present time positively to assert, but probably conservation has had something to say to it.

"I may also note that within the forest reserved area nullahs that, when I first came, used in the hot season to be waterless, now retain water more or less, here and there throughout the year, pointing to a greater retention by the subsoil of rain water than was formerly the case. Again, the streams within do not certainly seemingly flood so readily as before, and the discolouration of the water now takes place at a much later date than formerly. These remarks refer to a tract about 400 square miles in the Melghat, —the Bairagarh state reserve—where fires have for eight years been excluded, and where consequently not only has natural reproduction advanced with great rapidity, but the surface soil has annually improved from the accumulation of leaf mould and decayed grass, the roots of the grass and spread of the young trees tending to check denudation of the surface soil, and aiding the retention of water in the subsoil, and those other effects noted above."

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* 1st June to 31st August 1878.

BOMBAY.

Mr. Shuttleworth.

BOMBAY.

Northern Division.—The northern forest division of this presidency extends from the Kolhápur and Sáwantwari states on the south to Rajputána north. It includes the following districts:—

1. Satara.
2. Ratnagiri.
3. Colaba.
4. Thana.
5. Poona.
6. Sholapur.
7. Ahmednagar.
8. Khandesh.
9. The Dangs.
10. Nasick.
11. Surat.
12. Broach.
13. Kaira.
14. Panch Mahals.
15. Ahmedabad.

And the replies here given are made upon direct personal knowledge of these districts.

1. There has most certainly been within the historic period a very sensible denudation of the forest in most of the above districts.

Not very many years ago the crest of the western ghauts in the Deccan, known as the Ghát Matha, throughout its entire stretch was richly clothed with evergreen forest; "the Dhangs," or groves of primeval trees, still existing in places along the Ghát Matha, testify incontestably to this fact. These dhangs have escaped destruction owing to superstitious fears attaching to them. They were and are still considered by the ignorant peasantry, as well as by the better educated classes of the native population, to be tenanted by spirits to whom the trees are sacred, and the belief exists that if the trees are injured evil will befall, not only the person, but also the connections and property of the person, who commits the injury.

The cross ranges of mountains and hills abutting from the gháts, eastward through the Deccan, were also within the recollection of man mostly covered with forest vegetation, the remains of which are to be seen in the shape of temple, woods, and groves; as, for instance, at the head of a ravine below the celebrated temple of Mahadeo, at Shinganapur, in the Malsiras taluka of Sholapur, there is a very small primeval wood. At Mandardeo, in the Satara district, on the cross range constituting the watershed between the Krishna and Nira rivers, is a virgin grove occupying a small knoll, while all around is bare and denuded. Many more of these groves could be instanced; their vegetation shows that nature and not man was their creator, and every one of the principal cross ranges in the Deccan could thus produce testimony to prove that their present condition is the result of man's senseless, improvident destruction of the beautiful vegetation with which a far-seeing Providence clothed them for the benefit of the world and all that live therein.

The few existing trees which linger here and there on some of the hills in the far east of the Deccan likewise indicate that in former years, and not so very long ago, natural forests containing the species they belong to covered the hills. On the hill range forming the northern boundary of the Barsi taluka of Sholapur the remains of a mixed forest are to be traced. Blackwood, teak, and its associates are to be found, few in number, distorted and deformed, so as to be almost beyond recognition.

The country round Igatpuri, also in the Nasik collectorate, was a dense impenetrable forest, until the iron horse came and cut a path through the jungle, and consumed the wood to maintain its vitality. The introduction of the railway through the Nasik and Khandesh districts has done much to denude the hills of their natural clothing.

In the Konkan the destruction of forests has been very pronounced: many of the hills in Ratnagiri and Colábá have been stripped within the conservator's personal recollection; where a few years ago a dense cover of trees existed, lending beauty to the picturesque, and performing the bountiful offices of nature, now a Sahárá of desolation appears.

Guzerat likewise has kept pace with the other parts of Western India in the progress of forest denudation. Possibly the work commenced earlier here than in the Konkan and in parts of the Deccan. But in the Mándvi taluka of Surat, in the Dangs, and in the Panch Máháls, forests and trees have perceptibly vanished.

II. It is very difficult, if not impossible, to test by reliable statistics how much area of forest or scrub jungle has been cut down. But there is indisputable evidence to show that the destruction has not been confined to a limited area, but has progressed far and wide.

III. It is very easy to state specific facts which support the belief that such deforestation has caused injurious effects.

In respect to the

(*a*) *Rainfall*, its capriciousness in the Deccan, and in parts of the presidency not immediately bordering upon the sea, is undoubtedly due to the destruction of woods and forests; possibly there may be no very marked difference in the total amount of annual rainfall between what it now is and what it was several years ago; there is, however, an appreciable difference which the records of the rain gauge may not do much to enlighten us upon. The presence of trees in the country secures a permanency of humidity in the atmosphere throughout the rains; there is less evaporation during "breaks" in the rains; a stratum of saturated air hovers over the land, and a constant precipitation of moisture, not in heavy downpours, but in frequently recurring light showers, such as are termed "Scotch mists," takes place.

That the destruction of forests has destroyed these conditions, *i.e.*, has injuriously affected the rainfall or precipitation of moisture, is evidenced by the fact that in the Deccan above ghats, the eastern limit of rice cultivation, which can only obtain in the rains, has moved westward; fields that used to grow rice some years ago when the country was better wooded, are in the present day incapable of doing so.

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In the Konkan, too, it is acknowledged by many cultivators that the "breaks" in the rains are of longer continuance, and the evaporating power of the sun of greater force, than it used to be when the country was well wooded; and that this operates injuriously upon the out-turn of their rice fields.

In respect to the abundance or permanence of water—

(*b*) *In Streams.*—We have had many proofs that the destruction of forests upon hill slopes has caused destructive floods. In Khandesh, in 1872, one of these floods occurred in the Panzra and Girna rivers, which have their sources on the western ghats of Pimpalner and Baglan. The inability of the denuded catchment grounds, more especially at the head waters of these rivers, to retain the rain that fell upon them during a few short hours of a dark night caused a sudden flood to come down both these rivers; the bridge over the Girna at Malegaon was swept away; Dhulia was partially submerged; villages on the banks of both rivers were destroyed, human life, cattle, and household property were involved in the destruction that took place. Other rivers in the district, the Tapti, for instance, whose catchment area is better protected, were not similarly affected.

A few days ago a wave of storm water came rolling down the Nira river, and capsised the ferry boat and drowned some of the passengers. Had the hills and slopes, draining into the river, been clothed with vegetation, this volume of water would never have returned to the ocean, and the flood would have been more temperate and of less velocity.

The denudation of hills undoubtedly affects the permanency of water in rivers. There are many rivers in the Konkan, Deccan, and Guzerat which formerly held water all the year round, but now run dry soon after the rains.

On the ghat line, where forest protection has been accomplished, streams of water may be seen all the year round. On the Satara ghats, especially, many examples of this present themselves; where the hill tops and slopes are preserved by vegetation, there clear limpid streams flowing out of the mountain sides occur, and a few hundred yards off, where fire and the axe have destroyed nature's covering, the dry beds of mountain torrents offer a striking contrast.

Numerous instances, too, are to be found of the return of perennial water to the dried-up channels following the re-clothing of the hills with verdure.

The Ratnagiri collectorate is a case in point. Since the hills of that district have been denuded of vegetation the soil has been swept off their surface into the rivers and navigable creeks. Where the ocean tide has opposed the current of the stream there the soil has been deposited, bars and banks have thus been formed, and the depth of water has decreased so as to impede navigation and stop traffic.

(*c.*) *In Wells.*—All over the Deccan, in almost every village wells may be seen that have run dry, not through any silting up or decrease of depth, but owing either to the water contained in the soil having sunk to lower levels, or to the decrease in storage; more of the rain water runs off the ground than it used to when vegetation checked its flow.

There are several instances where water has returned to dried-up wells when the higher levels draining on to the wells have been re-covered with vegetation. In the Poona and Satara ghats wells can be pointed out in which this has occurred. Take the village of Málegaon Budruk in Máwal as an example.

That the deforestation of the country has rendered fields that were once highly cultivated now unarable is not difficult of proof. Constant complaints are made in the Konkan that the unregulated flow of water off denuded hills washes away the embankments of rice fields, sweeps crops away, smothers them under soil brought off the hills, scores the fields with gullies and watercourses, carries its soil

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off, and converts it into a barren waste. Cultivators numerously petition every year for the remission of their assessment on this account.

In the Deccan, too, survey numbers may be seen in many of the villages, especially near hills, which a few years ago were productive fields, now deprived of their soil, scored all over with deep channels for short-lived floods to race down, are waste, uncultivated, paying no rent to Government, and doing nothing towards the support of man.

The destruction of trees on flat lands, too, has rendered fertile fields unarable; the absence of dew and of subsoil enrichment, added to increased evaporation, no leafy protection interposing between the direct rays of the sun and the surface soil, has completely exhausted the land; huge cracks and fissures are to be seen all over the fields, and the absence of the chemical constituents of fertility prevent it from bringing forth its due increase; the fields, having thus become utterly impoverished, can no longer be cultivated with profit.

When the plains of the Deccan and Kandesh grew trees, then the fields were necessarily more fertile than they are now. The trees furnished the materials for the formation of that vegetable mould from which crops derive their nourishment; everything that fell off the trees became natural manure; by their roots the trees not only opened the pores of the soil, but drew up moisture from the bowels of the earth, which they distilled through their leaves, to water crops, to cool the air and to benefit cultivation. They shaded the ground at certain times of the day from the evaporating power of the sun.

There are numberless proofs in the northern districts of the destruction of reservoirs and the injury to cultivation following the eradication of trees.

In the Poona collectorate there are two large reservoirs, one at Warki, some 12 miles south, the other at Pâtas, 35 miles east of the city of Poona, built of masonry and well constructed. These reservoirs once stored large quantities of water, and now one is completely silted up, and the other is fast arriving at the same condition, and a forest growth has usurped the place of water. The cause of this is not difficult to discover; denudation of the catchment ground has sent avalanches of soil to fill up the excavated beds of the reservoirs. At Koregaon, in the Bársi taluka of Sholapur, the same thing is to be seen. A large lake, constructed at great expense, is no longer what it was intended to be—the soil of the overhanging hills has in a great measure silted it up, and babul trees have encroached upon its territory, while its dam has been thrown down by the headstrong rush of water into the basin, which silt had rendered incapable of holding what it was intended to when constructed.

In all directions in the northern districts, far and wide, bhandhárás or dams across streams are to be seen inoperative—they have either been tumbled down and swept away by uncontrolled torrents, or the storeage area behind them has been filled up by silt.

Along the foot of the Sátpurás, in the Tápti valley of Khandesh, a large tract of deserted country is to be seen at the present day. Numerous broken bandhárás testify that the denudation of vegetation on the upper lands was complete at a certain period of their history, and it is reasonable to conclude that the hundreds of masonry wells existing in the locality ran dry at the time that these dams were swept away, and that the result of this denudation, and of the deprivation of water storage for irrigation, was one of the causes of the exodus of population that took place. Wars and strife, too, had something to do with it. Now the country is covered with vegetation, and the wells hold water, but the cultivator has not yet returned.

In connection with the Nasik districts it has been reported by local officers that increased cultivation of sugar-cane has resulted from the protection of forests; that fields adjoining the forests, which could not be profitably cultivated a few years ago, now produce good crops of cane, and that whereas this cultivation now obtains in the villages where forest reserves have of recent years been formed and protected, it has not yet returned to the villages in which there are no forests.

IV. What steps should be taken towards reboisement, &c., &c.?

In the first place, I think that as much as possible of the hilly land, and of the undulating broken ground in the country, at present denuded, should at once be brought under protection.

The lowest stratum of air contains the greatest quantity of aqueous vapour, and hence it might be expected, *ceteris paribus*, that more rain would fall on low-level plains than in elevated countries. The contrary, however, is the fact. The increase of rain is gradual as we ascend. This may be accounted for satisfactorily by the colder air on elevated places, and by the clouds resting on the summits of mountains without descending into the plains.

If mountains be protected from solar radiation by forests, and if the transpiration from an enormous leaf surface has the same cooling effect as terrestrial radiation, it stands to reason that the effect of elevation is still further augmented; the fall of rain is heavier.

Forests should likewise be formed in the plains and more level grounds, where trees afford important assistance to agriculture by promoting natural irrigation, by preventing undue evaporation and exhaustion of soil, by providing manures, &c.

Trees extending along the sea-coast, by interlacing their roots with the land and alluvial soil, help to render it more compact; they also assist in arresting the mud deposited by rivers, and in forming the so-called deltas at the estuaries of the latter.

Forests planted on the banks of rivers have the effect of binding the soil and preventing erosion, and of confining the stream to its proper channel.

The absence of wood for domestic purposes in the Deccan, more especially, requires the formation of forest in the plain countries of Satara, Poona, Sholapur, Ahmednagar, Nasik, and Kandesh, where the bad effects of the scarcity of wood upon the domestic, public, and social concerns of the people are visible; the excrement of cattle is used extensively to cook food, and the fields are thus deprived of a valuable manure.

V. The *modus operandi* of reboisement.

The more expensive system of artificial planting by means of nurseries and transplanting should be undertaken in connection with favourable localities, where soil is deep and suitable and water at command. Casuarina plantations on the sea-coast should thus be formed.

Plantations of babul, bor, nimb, &c. on black soil in the Deccan, on banks of rivers, &c., should be made by ploughing the ground and sowing the seed in the furrows.

But the area of denuded hills, of lands possessing poor soil, is so very extended that a much less expensive *modus operandi* must be adopted in connection with these localities. Seed must be collected in the neighbourhood in large quantities and be brought from distant forests, to be thrown profusely by hand, at the commencement of the rains, over the denuded lands, which must be protected most strictly against cattle grazing, against cutting, and against fire. Conservancy is the keystone of success in the reboisement of denuded lands, and this conservancy must be real and not nominal. Guards must be appointed to watch, and the law, by deterrent punishments to destroyers and trespassers, must support the guards.

VI. Can planting and conservation be effected without interfering with the vested rights of the people, &c.?

No vested rights of the people will suffer. As a rule in the Deccan the people have as a part of their

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Mr. Shuttlewor

holdings in the hilly part of the country pôt kharâb land, *i.e.*, unarable, upon which no assessment is charged, and therefore grazing lands have been provided them in their own holdings.

If rights of the people do come into collision with the planting and conservancy arrangements, then, in the interests of the country and public, the exercise of the rights must be suspended for a time; in a few years, when the vegetation has made pace, the exercise of these rights may again be permitted, and will then be more valuable than before.

VII. Which method of reboisement would be the easiest, cheapest, &c.?

The system of broadcast sowing of seed, with closure against man, cattle, and fire, is undoubtedly the easiest, the cheapest, the quickest of operation, and most effectual where such a very large extent of denuded country presents itself as is contained in the northern districts.

VIII. What extent, and on how large an area, could either method be followed?

The physical configuration of a country and local circumstances must determine the portion of it to be under forest protection; as a general rule, 25 per cent. of every district should be under forest or tree growth.

N.B.—One final suggestion remains to be made in addition to the foregoing, viz., it should be provided as a compulsory measure, that the strip of waste, unassessed land belonging to Government, dividing fields, and forming the boundaries of the latter, should be planted with trees by the holders of adjoining fields, who should protect the trees, and while being prevented from cutting them should have the legitimate usufruct of the trees.

Lieut.-Colo: Peyton.

Southern Division.—There has been denudation outside the province, and along the western ghats in Goa and Sáwantwári territories bordering on Kanara and Belgaum. From considerably below Unshi to the Amboli ghat the forests have been almost entirely destroyed by kumri cultivation; also, many of the hills show the loss more or less of their surface soil, and have become barren of all but the most scanty vegetation. Within the province, in Kanara, along the ghats, this evil was checked something over 20 years ago, and has since been kept well in hand, but on its north-eastern frontier much forest or tree-clad lands have fallen to the axe of the cultivators in their advance, not, however, to any appreciable extent, and only to satisfy their fair and legitimate wants in fresh lands to cultivate. In the Bidi taluka of Belgaum denudation has been greater, and in the Belgaum taluka more again; in the latter, in particular, the hill sides have been seriously encroached upon, and broken up for cultivation more than was right. Around Belgaum, too, the hills have been much denuded, but those that roll east and occupy lines through the centre and southern portion of the Kaladgi districts, having more or less the Ghratprabhá and Malprabhá Rivers running through them, have suffered serious denudation. In Dharwar, along the southern border touching Mysore, the double range forming the Másur valley has been seriously denuded, and so also the rather lofty Kapat range south-east of Dharwar. Both ranges touch almost the Toongbhudra River.

The Goa and Sáwantwári tracts, denuded by kumri cultivation, may be roughly put down at between 700 and 800 square miles, and the other areas may be ascertained with some exactness from the records of the Southern Maratha Survey.

Of the effect of denudation on the actual rainfall I cannot speak, but my feelings and senses incline me to think the fall of rain is sensibly affected by the denudation of forests, but of the other injurious effects there cannot be doubt. It has often appeared to me in the direction where the deforestation has been indicated, in Dharwar and Kaladgi especially, that year by year the sudden rushes of water from the hills are destroying the culturable lands immediately below them, causing serious erosions and siltings. Many parts, in my opinion, of the lands along the base of those hills are fast being made arid from receiving rushes of water charged with kunkur (gravel) and mere sand, instead of the more equal distribution caused by the roots and stems of trees and shrubs, carrying with it the thick leaf-mould deposits of the deciduous trees and shrubs that once covered the hills, but which improvidence and waste have destroyed to a very sensible extent indeed.

Mr. Wallin

Poona.—Regarding the subject of "inquiries remedied by reproduction of forests," I would cite one or two instances. The village of Malegaon Budruk, in the Mawal talooka, is situate on the crest of the western ghauts. The valuable mountain forests of this village, 2,430 acres in extent, were demarcated seven years ago and are vastly improved. Grass is plentiful and the water-supply in the stream near the village has greatly increased, so much so indeed that a well built five years ago, with the help of local funds, at a cost of Rupees 250, is now made scarcely any use of by the people. In the words of the patel and kulkarni of the village, "You have here now, in the "low-lying lands, only to dig a few feet deep for "water and you get it." In a re-entering angle of the high mountain reserved for forest to the east and north of the village, and about 400 feet above the village level, is situated the rise of the Ranzani stream, an important tributary of the Andra river, which is a tributary of the Indrayeni, which is again an affluent of the Bhima. To my certain knowledge, no water remained in the high sloping bed of this stream six years ago after the month of February of each year. There was during May last to be found there flowing pure clear mountain-spring water. The people inform me that year by year the water is increasing in volume, and this fact and this subject generally have from my point of view a very deep importance. It is by the help of the countless numbers of little streams which now flow, most of them only during the rainy season, from the denuded hills and mountains, but which should be perennial in their flow, that nature seeks to maintain a permanent supply of water in the important rivers flowing eastward to the sea. The Ranzani stream is one of the first links in the water-supply of the Bhima, and having its rise in a mountain now well clothed with large vegetation, it is perennial in its surface flow.

Again, Torno is a village in the Khed taluka about three miles from the crest of the western ghauts, and is situate at the base of the mountain which divides the Andra and Bhama valleys. The forests here were demarcated in 1870–71, and have greatly increased. At the time of demarcation, and for about four years after, the water in the only well (three feet broad) of the village dried during the month of February or March of each year. The people then procured water from Tambrachi Waddi, a distance of three miles from Torna. The excavated but unbuilt well is situate at the base of the now well-wooded mountain on the bank of a nullah, a tributary of the Bowli river, which is a tributary of the Bhama, which is an affluent of the Bhima. There were last May nine feet of pure mountain-spring water in the well, which has now been made by the people themselves 15 feet broad. The water has risen to within five feet of the surface. The people here most freely acknowledge that this new supply of water is due to the increased vegetable growth on the mountain, and I am perfectly certain of it.

MADRAS.

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Sir W. R. Robinson.

The advancement of population and cultivation has led to the substitution of agriculture for scrub and jungle through great tracts in South India of late years, without any evidence of injurious effects on the south-west or north-east trades which supply South India with its moisture. The stratifications of the earth's surface which fill the country's springs—deep-seated enough to be uninfluenced by surface verdure—and supply its streams have not changed; and cultivated land has doubtless proved here, as elsewhere, a better absorbent of moisture than scrub and jungle clad waste. Forests have not been arresting famines in India, nor has their denudation been affecting the solar heat in general, in recent years. Human health has improved where formerly malarious fevers searched the pioneers of cultivation under jungle influences, and the haunts of wild beasts have receded. I think, therefore, that this fashionable scare need not trouble the Famine Commission in relation to the failure of the monsoons and natural droughts arising therefrom. At the same time, good and judicious forest conservancy and plantation are needed here, as elsewhere, for their own obvious reasons. But State forest conservancy will only be acceptable to the people where it is pursued without traversing legal and prescriptive conditions, and is divested of confiscatory wrongs. The people, too, may be aided in the conservancy of their communal and private forests and jungles by judicious direction, without traverse of prescriptive rights or advancement of novel claims by the State. I can only hope that fanciful famine indictments are not now to be added to the difficulties and theories of the forest question. As a famine question probably food areas may be preferred to forest and scrub areas; and the Commission may be asked to consider the cross allegations—whether so-called forestry has increased the cattle mortality, destruction of manure, and so on.

Mr. Pennington.

Tinnevelly.—The denudation of the forests in this district has been the constant theme of complaint for many years, and it has been alleged that the violence of floods has been sensibly increased thereby. It is certain, at any rate, that last December was distinguished by two of the most violent floods ever known in the valley of the Tamrapurni. There has been no reboisement to speak of, though some good has been done by an informal kind of conservancy. No doubt, the proper remedy for the forests is strict conservancy of all the real jungles, sufficient space being left on the outer slopes for cattle-growing and firewood. Such conservancy can, in my opinion, be carried out without any improper interference with the vested rights of the people, which, however, required to be carefully regulated.

Ir. Gordon.

Bellary.—There has been no sensible denudation of forest in this district within recent times. The Sundur state is the part which contains most forest. This is being yearly felled, and no steps are taken to supply the place of the trees which fall to the axe. There are no statistics showing over what area scrub has been cut down.

The district may be said to be devoid of jungle, although scrub exists in parts. These tracts, if preserved, would probably bear jungle of some size. Measures are being taken to conserve a portion of the scrub in Gooty and Anantapur taluks, and the experiment, if successful, will probably be extended. In this instance a sufficient portion of the tract will be left to the villagers for their use. Planting would be attended with great expense, except on the banks of perennial rivers, and would probably, except under such circumstances, fail to produce large timber. Owing to the stratum of rock to be found at a short distance from the surface, trees are stunted throughout such portions of the district as I have observed. In the black cotton soil nothing except the babul and the margosa appears to thrive. It is to be doubted if the hills in this district, except those in the Sundur state, were ever covered with jungle. Their rocky nature in many cases renders it very improbable that they ever could have been so. Such statistics as exist go to show that there has not been any general decrease in the fall of rain for the last 20 years.

Mr. Price.

Chingleput.—There has been sensible denudation of fresh lands within my experience; but it is impossible, as regards this district, to state, as there are no books of reference or statistics available, what extent has been destroyed. When looking over some old letters a short time ago, I saw reference to jungles which now no longer exist. I do not think from the look of the country that there ever could have been much real forest in it. It must have been pretty nearly all scrub. The cocoa-nut and bamboo were introduced within a very recent period, and so were the now all-pervading casuarina and many other trees. The Striharikottah jungles, which now belong to Nellore, but which formerly were part of this district, were, within the memory of living man, dense thickets filled with deer and other wild animals. They, until a few years ago, were hacked to pieces for firewood for Madras, and have only lately been conserved. This district being so exceedingly flat, the only way in which deforestation would appear capable of affecting it would be by decreasing the rainfall. There are no facts obtainable to show whether this has occurred or not, nor has there been, as far as I know or could ascertain, any injury resulting therefrom.

My knowledge of the Salem district and its forests, in which I took some interest, extended over a considerable period. Within the eight years during which I was there I recollect large patches of jungle which, when I knew them first, were thick and heavy, giving cover to abundance of large game, completely cleared away for cultivation. I know of acres of forests hewn down for the railway, and of miles of it destroyed by fires, which with a sufficient forest staff could have been protected. I know of two spots where, within my own memory, there were springs which ran all the year round, and which in consequence of the felling of the jungle have been entirely dried up. One was on the Melgherry hills, the other at a place called Kodagur. I have seen during the showers of the south-west monsoon clouds pass over a large open clearing, and be precipitated in rain the moment that they were over a sholah. I consider from what I have seen that forest does affect the rainfall. The clearing of forest which is within my own knowledge has most certainly affected the permanency of water in the jungle streams, which are the feeders of the larger rivers, and I could personally point out the particular spots. In the northern portion of the Salem district, where the country is rolling and soil red earth, I myself know places where the clearing of scrub jungle for cultivation has led to the appearance of large nullahs, which are constantly growing; this, however, is not very extensive. It is as yet far too early for any one to form an opinion as to the effects of the reproduction of forests in spots where it has been cleared away. Efforts to this end have

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Mr. Price.

been largely made in the Cuddapah and Salem districts, both of which I know well; but the forest which has by these means been raised is, as to that which preceded it, as a toddling child is to the full-grown man. I have not the slightest doubt that the clearing of the forest has exercised an injurious effect upon the streams. I consider as a means of reboisement that all hill jungle should be conserved, and that the cutting of timber or occupation of ground for cultivation for a certain distance along the margins of all streams should be prevented. I would at first combine artificial planting with keeping out cattle and fires; but I would not in restoring follow the course adopted for many years by the Forest Department, viz., planting in trenches or planting out and watering. The theory which I have long held is that in making up forest one should follow nature as much as possible. She distributes seeds of different kinds in such places as are favourable for their germination and growth, and all that I would therefore do would be to collect large quantities of the seeds of jungle trees of the adjacent region, and just before the rain send men round with bags of these and a mamotie, and instructions wherever there was a blank space and a favourable looking spot to dig a small hole, sow seeds, and leave them to take their chance. I would keep out all goats and sheep; they and fires are fatal to young forest. Cattle are not so bad, but still they are better out of jungle until it is well up. This plan of sowing I tried in 1865 on the hill near Arcot railway station, but I was moved the next year, and I believe that my successors did not trouble themselves any further with the experiment. I did not see the hill for some years afterwards, but when I did I could plainly perceive in places the effect of one year's work. The sub-collector, at my suggestion, is trying my plan on the low bare hills about Chingleput. In the Salem district I left comparatively small patches of jungle in the plains, *i.e.*, which I had made by ploughing the land and sowing broadcast such seeds as were suitable to the soil. I have recently heard that these bore the late drought well, and that they have grown up in a surprising manner. I have experimented upon trees, of which in two districts I have planted altogether pretty nearly half a million in many ways, and I am convinced that the plan which I have mentioned is the cheapest and most effective. Sheep, cattle, and especially goats must however be kept out for four or five years, and precautions against fire, by cutting rides and clearing them every year, must be taken. The question of the vested rights of the people is one which requires systematic treatment. In both the Salem and Cuddapah districts there are miles upon miles of forest land, which could be conserved without injury to the people, or depriving them of sufficient space for pasturage. The native custom has been to consider all Government waste land grazing ground, upon which anyone who chooses may feed his cattle, &c., may hack the saplings to pieces to as great an extent as may please him, and upon which, when he thinks it desirable to improve the pasturage, he may light a fire and burn up thousands of young trees in order to procure fresh grass. These may be called vested rights, but I do not consider them such. The destruction of the forest has gone on to such an extent over the parts of the presidency with which I am acquainted that it is high time, if anything in the way of conservancy is intended, to take the matter in hand. It is quite possible to work this in such a way that the people, cattle, &c. shall be excluded from certain tracts until they have grown up to that degree at which grazing will do no harm, when another piece might be taken up. I would certainly not allow the people to have the "run" of the jungles in the way in which they for many years have.

Mr. Foster

Godavery.—Considerable denudation of the forests is continually going on through what is called pôud cultivation. The ryot cuts down the trees and burns them and sows his seed in the ashes. He sometimes sows a second crop on the same land, but he generally moves to another block after he has got one crop and burns the second block down. He will not come back to the first piece for about eight or 10 years. I think, as a general rule, he prefers never to cultivate the same piece of land twice in his lifetime, provided he can find other pieces of jungle to burn.

Mr. Logan

Malabar.—The statement given below shows approximately the extent of forest cleared, within the last 20 years, for agricultural purposes. In Malabar, for a long period, promiscuous and injudicious felling of forest timber trees by private parties has been going on to a mischievous extent. No attempt is ever made to plant up the tracts thus denuded.

As yet, however, no great injury has been caused. In some places a sensible diminution in the permanence of water in the subsoil is, I am informed, perceptible in the case of fields and gardens situated in the midst of detached hills on which there was formerly a good deal of scrub jungle now no longer in existence. As regards the rivers, however, deforestation has not yet, fortunately (except, perhaps, in the Cherakal taluk), been pushed sufficiently close to their sources either to cause an appreciable diminution in volume or to check a continuous flow of water throughout the year.

The best remedy that suggests itself to me for the evil threatened is to take steps to bring under conservancy as large an extent of the forest tracts as possible, either by private arrangement with the proprietors (for the largest proportion of the forests is considered as private property in Malabar), or, if necessary, by legislative interference under the Forest Act, 1878.

I do not, however, think that the time has arrived when further legislation should be had recourse to as far as Malabar itself is concerned, though possibly district officers on the eastern side of the ghats may have good reason to take exception to the denudation of the ghat forests situated in this district.

I think it is worth while considering whether we might not, with advantage to all, extend forest conservancy in the district by private arrangement with the proprietors where such exist. A good beginning has already been made, *e.g.*, in the case of the Conolly teak plantation near Nelambur on the bank of the Beypore River.

STATEMENT showing ACREAGE of FOREST LAND in the MALABAR DISTRICT cleared for purposes of CULTIVATION during the last twenty years.

Taluks.	Extent in Acres of Land cleared.	Remarks.
1. Cherakal - -	348,783 3 5	The extensive clearing in Cherakal was for ponom (kumari) cultivation. The land was not permanently cleared. Scrub jungle grows up in the years when there is no ponom crop. In Wynad the clearing was chiefly for coffee.
2. Kotoyam - -	20,230 2 0½	
3. Kurambranad - -	40,580 5 4	
4. Wynad - -	119,566 0 0	
5. Calicut - -	3,312 4 0	
6. Ernad - - -	4,593 0 0	
7. Valuvanad - -	2,019 6 6⅜	
8. Palghat - -	13.695 0 0	
9. Ponani - -	—	
10. Cochin - - -	—	
Total - -	552,779 4 15⅞	

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Ir. Webster.

Coimbatore.—There has been a very great denudation of forest in this district within the last 40 years. We have no statistics showing over how much area forest or scrub jungle has been cut down, but lands are now miles away from the forests which, within the memory of man, were covered with dense jungle and were overrun with wild elephants. I do not know of any specific facts which lead me to think that the deforestation has caused injurious effects as regards the fall of rain, though it has had many evil effects, which I will notice. I do not think the deforestation has affected the rainfall or the cultivation to any serious degree; seasons were often remarkably unpropitious before the forests were cleared. The situation of this district is, however, peculiar, being immediately behind the high ranges of the western ghats which turn the rains, and the rainfall has always been very scanty.

As regards the supply and permanence of water in the streams, the people all say that the streams run dry much sooner now than they did formerly.

The deforestation and the clearance for cultivation of the waste lands (scrub or grass) has considerably diminished the grazing ground of the people, and they have, in consequence, to send their cattle further in the hot weather. The supply of firewood is also diminished, and, in consequence, straw and cowdung are burned that ought to be put in the soil. No attempts at reboisement have been made in any systematic manner.

r. Horsfall.

Kistna.—There has been a gradual and progressive denudation of forest. The testimony of all officers is unanimous on the point. It is a fact within the personal knowledge of every official of any service in the district. Formerly, the Government ryot was not allowed to cut the trees on his puttah lands; but this restriction was withdrawn some years ago, and within my own knowledge many valuable trees, such as tamarind and mango, were cut down and sold. In some instances, lands were taken up temporarily for the sole purpose of cutting the timber thereon, and as soon as this object had been effected thrown up again. This disastrous procedure has been checked to some extent by the rule that applicants for fresh lands have to pay the value nominally of the trees standing thereon. The rule is good as far as it goes; but is, I fear, very generally evaded. There are no statistics showing the extent of forest or scrub jungle which has been cut down. Such lands were entered in the old accounts as porumboke. Up to the time of the recent survey, the area occupied by forest or scrub jungle was not ascertained; but there is no doubt that, as cultivation has gone on increasing from year to year, the jungles have been encroached upon. Between Faslis 1271 and 1274 the cultivation of cotton increased from 100,000 to nearly 250,000 acres; the greater portion of the increase is known to have been jungle taken up for cultivation.

The difference in area under occupation in Fasli 1269, when the Kistna district, as now constituted, was first formed, and that under occupation in Fasli 1287, amounts to nearly four lakhs of acres, being 14 and 18 lakhs respectively. So far as is known, there has been no diminution in the rainfall. A rain register has, however, only been kept since the year 1852; nor has any alteration been observed in the abundance or permanence of water in the streams, wells, and subsoil. No noticeable denudation of soil has occurred. The soil is said to have deteriorated to some extent owing to cattle dung being used instead of firewood, which has become scarce.

There has been no reproduction of forest.

ieut.-Colonel Beddome.

The denudation of forests for actual cultivation—paying assessment—has been very great during the last 20 years, as I have ascertained from reports received from the collectors and forest officers of all our districts, and it is of course very much greater in some districts than in others. In Wynad it is said to be 22,526 acres, and it has been very extensive on the Nilgiri. In the face of railways and an ever-increasing population, it must of course go on extending, and there is still ample room for much extension, though of course there must be a limit. Revenue officers will be too anxious to open out the hill tracts of their district and realise a revenue from the land, and can scarcely be trusted entirely with the question as to what tracts are to be reserved. This should in future be almost entirely under the Forest Department, who should be responsible to Government that the water-supply of the country is not affected to any great extent. Unless this reservation be placed under the trained and responsible department, the very tracts which it is most desirable to reserve will often be the first to be alienated.

Coffee and tea bushes will never protect the soil and water-supply in the way that forest does; the soil being constantly broken up is washed away, and there is no accumulation of humus.

Coffee appears to be anything but a permanent cultivation, as shown by the long list of deserted estates in the Wynad.

The practice of felling and burning hill forests for temporary cultivation (kumeri) is most injurious to the country, and must sooner or later be put a stop to altogether. In some cases this pays assessment, but there is much carried on illicitly, of which no returns could be forthcoming. Only two or three crops (sometimes only one) are taken off the ground, which is then deserted, and reverts to jungle, but only again to be felled and burnt after a few years, each successive growth being poorer than the one preceding it, till in time the tract becomes the merest scrub or bare rocky ground with scarcely any soil. This I have seen exemplified in many of our districts.

Mr. Ferguson, the forest officer of Nilambur, explains the process of forest gradually turning into the poorest scrub, and he states that 4,000 to 5,000 acres are thus destroyed annually in Malabar.

Messrs. Peet and Morgan, the forest officers of Coimbatore and Wynad, state that kumeri holdings are often not the bonâ-fide property of hillmen. They often belong to well-to-do ryots and merchants in the plains.

Apart from the question of the inroads of cultivation and the destruction of forest by felling and burning for temporary cultivation, there is the fact that almost all our dry deciduous hill forest tracts are rapidly deteriorating before armies of goats and cattle, constant fires, and the unpitying axe and bill-hook of every goatherd or cowherd. The jungles and grazing grounds below the hills and often on the slopes have of late been cleared for cultivation, and the people now invade our mountain forests. This is a far more important question than either of the others, and cannot be grappled with except through a Forest Act. Cattle-grazing beyond the jungles or forests of village limits must be taxed, and under the supervision of this department, so that the graziers can be punished if they take axes or bill-hooks into the forests or light fires. Grazing must be restricted to certain tracts, and large tracts of forests must be reserved against it and fire, or only be open by blocks in rotation, as can be arranged under scientific and systematic management.

Our forests are still vast, and it is not too late to introduce systematic conservancy, which can only be accomplished with the assistance of an Act and strict rules; but the destruction has been rapidly increasing year by year since the introduction of railways, and

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there is not now much to be time lost. Unless we shortly have a Forest Act and a regular system of reservation, I feel certain that another two or three decades may materially alter the climatic conditions of many of our districts.

The Forest Department has only been in existence 22 years, and for its first decade or more it was only a department for the collection of the revenue from the forests belonging to the State. Of late years the more important questions connected with the upkeep of forests have attracted much attention, but the department has been, as a rule, utterly unsupported by any of the revenue authorities; the native officials particularly have been in every way opposed to it, and have thwarted it in every way, as they have suffered much in pocket and in influence by its introduction, and its rules have in every district, it is feared, been more honoured in their breach than their observance.

It is possible that Government might deal with the State forests without the introduction of an Act, but even this is very doubtful. There are however vast tracts of mountain forest belonging or supposed to belong to private individuals, the upkeep of which as forest land is absolutely necessary in the future unless the water-supply and climate of the country are to be seriously tampered with and to deteriorate year by year. Government must be in a position to say that certain mountain forests, steep slopes, or ravines protecting the water-supply must not be destroyed, that they must be treated as forests, *i.e.*, worked only to their reproduction, but not be cut down or burnt, whether they belong to Government or to private individuals.

The protection of every mountain stream is of more or less importance, but I may just mention two or three all-important questions which, if they do not receive attention very shortly, may bring much ruin on the country.

The magnificent evergreen forests protecting the slopes of the ghats in the Tinnevelly district are now threatened with destruction for coffee; in fact, the destruction has already commenced. Vast tracts of these are now acknowledged as the property of Native zemindars, and if their clearance is effected the Tamrapurni river will suffer considerably. Tremendous floods and corresponding droughts must be the result, and the district may be ruined. It will only be the work of time.

The vast evergreen forests on the mountains between Coimbatore and Manar are now threatened with destruction for coffee, &c. These protect the sources of the Bhavani river, and their destruction would seriously affect that river. It is not known whether these forests belong to Government or to a Malabar Nair who has lately claimed them.

The splendid evergreen forests on the mountains at the south-east end of the Cumbum valley protect the sources of the Vaige and Shurli rivers; if these were destroyed it would bring ruin on the Madura district. Large tracts of these belong to the Gantamanayaknur zemindar, and some belong to this Government; but it is believed that Travancore disputes the right to portions of the "highway"—a most important tract with reference to the water-supply of the Madura plains.

The forests on the Nilgiri, Wynad, and Coorg have been rapidly disappearing during the last 10 or 20 years. If this destruction is allowed to go on the Cauvery river must in time be seriously affected. There are still vast tracts of forest, and many splendid forest-clad ravines protecting numerous streams, but what if they all go? And if there is no legislation on the subject and no official reservation to be guarded by a responsible department what is to prevent it? At the present rate of destruction there would be probably nothing left in another century or less.

Collectors can furnish returns showing the amount of forest-land cleared for cultivation and paying assessment during the last 20 years or so; but this will not show the numerous tracts illicitly felled for hill cultivation, and no returns can represent the vast tracts of forests naturally deteriorating by reason of unrestricted grazing without supervision and fire.

To obtain any reliable specific facts as to the mischief caused by deforestment would require observation and data collected for a long series of years.

The Forest Department is only of very late introduction into most districts, and little or no attention has ever been given to questions of this nature. The revenue authorities seldom remain more than five or six years in any particular district, and they very rarely go into the mountain forests, or know what is going on in them. It is rather to other countries, where statistics have been collected for many years, and where the forests have been allowed almost entirely to disappear (which is anything but the case as yet in India), that we must look for facts of this nature. The numerous books now being published on forestry and kindred subjects in Europe and America are full of statistics of the mischief caused in many comparatively temperate countries by the destruction of mountain forests. Can it be doubted that the same destruction can go on in a tropical country like India without similar results? Considering our vast tracts of forests and our splendid chain of ghats and isolated blocks of hills it must be slow, but it will be equally sure.

Mr. Turner, lately assistant agent on the Jeypore hills, with only a four or five years' experience of the district, spoke to the drying up of streams caused by deforestment. Major Jago, the officer in charge of the Nilgiri, and Mr. Morgan, lately in charge of North Coimbatore, speak to similar facts in their letters now forwarded. The clearing away of forests protecting a spring or head of a stream almost always dries it up, and the denudation of the forests protecting the slopes of ravines down which it runs seriously affects it, causing a great rush of water after heavy rain and corresponding diminution at other times. These facts are too patent to require proof, but can be established by most forest officers. To illustrate the ill effects of deforesting steep mountain ravines I could mention nothing more appropriate than the Coonoor ghat ravine, the approach to the Nilgiri from Mettapolliem. I have been up and down this many times nearly every year since 1857, and watched the gradual destruction of the forest, trying hard to stop it, but with what result is very evident, although Government have passed several orders forbidding the clearance of the forests (this is the result of forests being under the revenue authorities instead of the Forest Department, and no one of course being responsible, as the revenue authorities are constantly being changed). When I first knew it the ravine was all forest-clad, both sides, and in the heaviest rain there was no very apparent wash of the soil, no landslips or rolling-boulders, and the rivulets feeding the river down the centre of the ravine all running tolerably clear. Now the north-east slopes or the slopes above the road have been almost entirely deforested, and it is quite dangerous to go up the ghat during very heavy rain, which often occurs in October, November, and the beginning of December, and sometimes in May. Boulders of rock of various sizes from several cwts. to 100 tons come rolling down, rendering the old and new ghats impassable and destroying the bridges, and the soil in many places pours over the road like lava, and the water in the streams is of the consistency of cream. Most of this deforested land has been planted with coffee, and many people would argue with advantage to the State; but the forest officer says steep mountain slopes like this must be protected from denudation for coffee, as it is utterly impossible that the soil can last very long. The forest has now been replaced by coffee, and in the future coffee will be replaced by a rocky barren mountain slope with no trees or cultivation of any sort, and the State will then say how improvident our ancestors were. Tree-planting will then be too expensive, and though in the course of time protection and conservancy might even then cause the débris of

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MADRAS.

eut.-Colonel Beddome.

grass and weeds, &c. to form a soil which in time would produce jungle and eventually forest, this would in any case be the work of centuries and perhaps in the face of such a rainfall impossible even to the length of time. Deforestment on the other slopes of the same ravine has now commenced. I mention this particular ravine as one with which most people in this presidency are acquainted, and the mischief brought about in which has been noticed by many even casual observers. The same results, however, are occurring in all other steep ravines brought under the same treatment.

Artificial reboisement by planting on our mountain slopes and hills will be far too expensive, and we have not yet arrived at a stage when it may be said to be necessary. Natural reboisement by reservation of tracts against goats, cattle, and fire is all that is necessary, but to effect this a Forest Act is necessary, and forest officers must have more power.

No forest conservancy could probably be effected with the consent of the people, if they were consulted.

They, of course, cannot be expected to think or care about the future. Present profits and present comforts and privileges are all they think of. It is the State that must take care of the future, and legislate so that the introduction of railways, an ever-increasing population, and cultivation are not allowed to bring ruin on the country at a future date, even though that date may be a distant one. It is difficult to say what the vested rights of the people are. They have never been defined, and are, for the most part, only privileges which can be regulated or restricted by the State as circumstances require, and which, if not so regulated and legislated for, must rapidly disappear altogether; as forests will cease to exist without systematic management and many restrictions. It is calculated, however, by this department that in most districts one-fourth or one-fifth of the hill forests might be strictly reserved without much undue interference with present privileges. Every year, however, will make the question a more difficult one. The sooner it is grappled with the better. It is with the private proprietors of forest that there will be the greatest difficulty. They, of course, will look to immediate profits, and if by cutting down or selling a forest they can realise a revenue they will care nothing what may occur in the future from such action. This is a subject that can only be touched by special legislation.

MYSORE.

Mr. rishnaiengur.

MYSORE.

The measures for the reproduction of forest having been adopted only a few years ago, and the conserved forests being yet too young, I am not now in a position to say that the evil caused by the clearing of the wood has been remedied to any extent. The step which I propose towards reboisement is that which has been adopted in this district to some extent, and that is, simply conserving the suitable tracts, putting down there in the rainy seasons the seeds of indigenous trees ordinarily grown in the locality, preventing the cutting of the saplings and keeping out the cattle, especially goats and sheep, as this method is cheaper and more successful than the artificial planting which is so costly, and which in a financial point of view is impossible to be carried on extensively. Simple conservation such as that adopted in this district is easier, and the desired object can be gained more effectually with little or no cost, if we carry the ryots with us. There would be no necessity to interfere with any vested rights of the people, as there is plenty of Government inarable wastes in the country* to which no private individual has any claim, and the co-operation of the ryots can be secured, if judiciously managed. For further particulars of the system under which conservancy of forests is carried on in this district, I beg to refer to my memorandum dated 31st July 1878, which was submitted to Mr. C. A. Elliott, C.S.I., Secretary to the Famine Commission, as desired by him in a demi-official letter.

Memorandum on the Management of District Forests in the Kolar District of the Mysore Province.

1. This district has or had no forest producing any valuable timber such as teak, black-wood, and honne, but there are many tracts where other species of wood, such as jalari (lac), babúl, nim, karag, &c., could be grown, and numerous forests of this kind appear to have been in existence in former days. These had all, I believe, been formed and conserved by the villagers with the aid of kavalgars or watchmen, who were, as a rule, remunerated by the village agricultural community, the Government only supplementing the remuneration by small grants of inam lands in some special cases; but these forests gradually disappeared, as the patels gave up their interest in them in consequence of their service inam lands having been thoughtlessly resumed about 60 years ago by the Government of the day.

2. I was sadly struck with the barrenness of the country when I first took charge of the district in 1864; and having spoken to the intelligent and influential patels on the subject, pointing out to them the great benefit the ryots would derive from having wood in their neighbourhood, and assuring them that their services in conserving forests would be recognised by the present Government, they conserved suitable tracts within the limits of their villages, and their example is now generally followed by others.

3. At the outset there was, of course, some difficulty in reviving the good old custom of the country about the conservation of forests; but it is no longer felt, as under the arrangements made in this district the sympathies of the very parties from whose reckless and clandestine felling of the wood we have to protect the forests are enlisted, and they are made responsible for their conservancy, bearing themselves all the cost of it, instead of employing any outsiders to watch the forests and subjecting the ryots to all sorts of annoyance and hardship.

4. The following are the arrangements:—

I.—No lands cultivated or cultivable which are close to the village, nor those conveniently used as pasturage common to be taken up for forest.

II.—Mountains and hills, and in their absence other uncultivable lands at some distance from the village, to be reserved for growing wood.

III.—In rainy seasons, the ryots to put down in the reserved tract seeds of indigenous trees commonly grown in the locality.

IV.—The patel to employ one of the village servants where available, and some one else in other places, to watch the forests of his village, making arrangements with the ryots about the remuneration of the servant so employed.

V.—The ryots of the village concerned to be allowed, in return for this service, to collect dried brushwood for fuel and cut long grass for thatching, &c. in the reserved tracts.

VI.—None to be allowed to let the cattle, particularly goats and sheep, into the reserved tracts until at least the trees grow to such a height that the beasts

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* About 416,000 acres of inarable lands lie in this district alone.

Mysore.

Mr. Krishnaiengur.

could do no injury to them, and none to enter into them with any cutting instrument.

VII.—No one to fell any timber or bamboo without obtaining a license from the district officer, and no license to be issued without previously consulting the patel as to the fitness of timber or bamboo to be cut, as he is held responsible for the growth and protection of the forest of his village.

5. It is the duty of the patel to report if any mischief is done to his village forest, and such mischief is punished for either under the forest rules or the Indian penal code.

6. The shekdars of hoblies are to inspect these forests as often as possible, and see that the above arrangements are carried out properly, reporting on their condition to the amildars, who are again to submit their reports to the district officer after their periodical inspection.

7. The forest conservancy under the above arrangements is working smoothly, and the patels and shanbôg generally take so much interest in this good work that in many places they have employed men to watch the forests of their villages, either setting apart the produce of a particular portion of their own holdings or cultivating and paying the assessment of a separate field for their remuneration, and also arranging with the ryots to pay their quota of the remuneration in grain at so much for a plough; and I have also in a few cases obtained the Chief Commissioner's sanction for the continuance to the hereditary watchmen of their service inam land which had been resumed under the recent settlement of the Inam Department.

8. There are now many forests thus managed in all the 10 taluks of this district, the number of the extensive ones being 67, and their approximate area in round figures being 152,000 acres, excluding the petty village forests, of which there are hundreds. Sir Richard Meade was pleased to inspect some of these forests when he made a tour in this district in 1874, and distributed presents to some of the patels in recognition of their services in this matter.

9. There are still many tracts in this district fit for growing forest, and with some exertion on the part of the revenue officers they can also be easily conserved, as new inam lands or other emoluments are now attached to the office of patel.

10. With the object of encouraging the individual ryots to grow forest, I proposed some time ago that the system introduced by the Survey and Settlement Department of putting up annually to public auction the unarable lands for grazing purposes may be discontinued, and such lands leased out to individual villagers at a fixed pasturage rate which, in this country, is one anna and nine pie per acre, the Government reserving their right to all the wood therein grown; and the Chief Commissioner, Mr. Dalyell, was pleased to observe in his proceedings of the 7th May 1876 that the matter was under his consideration, and that information was called for from the commissioners of divisions on the subject, but the question still remains unsettled. My belief is that if this proposal be carried out, it will not only enable the Government to get permanently more revenue than the fluctuating income it now derives from the annual sale, but will also obviate the trouble of selling each number every year, a practice by which the Government loses when there is a combination in the village, and the ryots suffer if there are factions among them, one party bidding against the other, not for gain but from spite.

11. If one man is allowed to take up such tracts of land as may not be required for the Government forest, at fixed rates for pasturage, he will necessarily let trees grow, as a piece of land under the shade of trees retains more moisture, which adds to the growth of grass, whereas the purchaser of the grass at the annual public sale simply looks to his gain for the year, without caring for the trees growing in the land. This is not my mere conjecture. There are instances of lands leased out at pasturage rates in some part of the country not yet surveyed being covered with trees, while those annually sold are quite bare and treeless.

Captain G. J. Van Someren.

The question as to whether there has been within the historic period any sensible denudation of the forest in, or bordering on this province, may, I think, be safely answered in the affirmative. Wilks, in his History of Mysore, speaks of "dense forests," meaning apparently evergreen forests, where now there is little more than deciduous scrub. This is, I think, very manifest in the Anvatti Mágani of Sorab taluk.

Buchanan, in his Travels through Mysore and Canara, speaks of a teak forest at Tuduru in Nagar division where there is now no such forest. The manner in which he writes of the "woods" in the Arkavatti valley near Bidadi, of those about Magadi, and at Madgiri in the Tumkur district all seems to show that these woods then carried much more tree vegetation than they now do.

The remains of the hardwickia forests in the Sira taluk, and in the Chitaldroog district north of Bomagundanakere, show that these now desolate plains were covered with trees. At page 7 of "Notes on Mysore" (see selections from the Records of the Mysore Commissioner's Office), Succroypatam" is mentioned as forming a part of the "Oyagoor" pollium, and is described as a country "thickly wooded, like the Nuggur province." Sakrepatna is now a poorly wooded district. I have myself seen and measured a teak tree stump, with a shoot one foot in diameter, in the Siddara Kanave valley near the Mari Kanave in Chitaldroog, where, though the country is not absolutely void of trees, still it is clear that it has suffered greatly from the loss of forests which it once carried.

A careful inspection of a large part of north Dod Ballapur taluk in Bangalore district, and of parts of Kortagiri, will show evident traces of extinct tree forest; and this is confirmed by tradition. The same may be said of the country between Nelamangala and Tavarekerre, still known as the Chandanaranya, or sandal forest. To be so called it must have carried much deciduous forest. This has almost all disappeared, and with it the sandal.

The northern portions of the Kolar district suffered greatly from the raids of the Pindari freebooters in the old days, and to the devastation caused by them and the Mahrattas must be due much of the present treeless state of the country. But it is difficult to believe the tales told of the towns that were formerly scattered over the district (one of them, Adlikot, is said to have had gates of brass) without also believing in the existence of much more tree vegetation than now exists. A careful inspection of the wide plains in Srinivaspur taluk leads to the same conclusions, and these are confirmed by the direct statements made to me by ryots regarding the once far greater extent of the jungle, which is now almost entirely limited to the Mudumalagu and adjoining hills near Royalpad.

Then to come down to the present days. The demand for firewood in Bangalore alone has caused a very perceptible decrease in the extent of wooded land near Closepett, about Mirlwadi in Kankanhalli taluk, about Rajihalli in Anekal, and in the Kortagiri taluk where it borders Dod Ballapur, near Ujni Betta.

With these observations I will answer the question to the best of my ability. (1) "*In respect to the fall of rain.*" Taking an average over a long course of years, I think it improbable that, unless all the forests in Mysore were cut down at once, any very great difference would be found in the quantity of rain that falls yearly on the soil. This would result from the geographical position of the country.

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MYSORE.

Captain G. J. Van Someren.

But where there has been any local denudation of the soil rain-bearing clouds will pass over such places, and discharge themselves elsewhere where more favourable circumstances exist; or they will gradually disperse themselves. An accumulation of such instances will tell on the yearly rainfall, while the local distress is out of all proportion to the resulting diminution in the total rainfall of the province. Without being able to appeal to registers any opinion is liable to be set aside, but I would here instance the following. The forest officers who have had most opportunities of judging (Mr. King, Assistant Conservator, and I myself) are certain that more rain falls on the area covered by the Madgiri State forest than on the area covered by the rocky hills which bound it in parts and which lead up to the town of Madgiri, or on the country on the other side of the hills. Clouds coming either from the north-east or from the west drift round the hills and discharge themselves in the wooded valley. I had many opportunities of noticing this one year during the month of October, and Mr. King has arrived at the same conclusions from independent observation. To this I would add the fact that the rainfall at Bangalore itself, and in the country immediately adjoining it, is higher than it is a little further off. I attribute this entirely to the great number of trees growing in the town and its environs. There is no apparent reason to account for the fact of the higher rainfall. In my letter, No. 1423–160, of the 14th September, 1878, I have pointed out that the fall of rain in the heavily wooded valley south of the Mysore province is almost certainly due to the forests in that valley. On these grounds, I reason that the deforestation of say parts of the Chitaldroog district and of Sira taluk has injuriously affected, and continues to affect, the rainfall there.

(2) "*or the abundance or permanence of water in streams.*" At first sight, it might be thought that I should be able to produce many instances under this head to prove my belief; for there has been much felling of forest in Coorg for coffee cultivation. But here again it would be difficult to bring many specific instances which might not be hotly contested. When land is felled for coffee it is necessary to build a pulp house on it. Water power is pretty sure to prove the cheapest means of turning the wheel of the pulper, and every endeavour will be made to utilise all available water by turning streams from their natural courses. The mere fact of a stream not now running where it formerly did cannot be always or entirely attributed to the fact of the forest being felled. Farther on I will adduce reasons for believing that, making all allowances for such diversions of streams, the supply of water is both less abundant and less permanent. But I can give three instances, all in Coorg. (A) From 1862–1864 I was with my regiment at Mercara. The high road above the Chinchona gardens to Mercara then ran past Runga Chariya's estate, and the hill to the right of the road and between that estate and Mercara was at that time covered with trees. A stream used to fall on to and cross the road. It was unbridged, but paved with rough stones. It used to run all the year round, and in the hot weather was some three or four inches deep and some four feet wide. The hill is now pretty well cleared of all trees. This clearing, I think, began in 1866. In 1872, and again in 1874, I had occasion to go down the old and abandoned road in the hot weather. I noticed that though the stream apparently still ran in the monsoon it was quite dry when I crossed it, and the bed full of dust. The stream has not been diverted. (B) In the same years, 1862–64, I used frequently to go from Mercara four or five miles to the Fish River to bathe; going either by a track bordering on and south and west of the Mercara estate, or passing through the estate reached it by a track running below Bettimullay. Since 1864 a good deal of land has been cleared in this part of the country, and on two or three occasions when I went down of late years to the same point on the river I missed many little streams which used to run all the year round. These streams could not have been diverted to the pulp houses on any adjoining estates. (C) There is a small patch of evergreen devarakadu (sacred forest) along the road which, running through several of Mr. Stewart's estates and the Catharine estates, unites the Tittimatti Virajpett and Siddapur Virajpett roads. All the deciduous forest round this patch of devarakadu has been cleared away. The evergreen trees in the patch are dying out, and it is perceptibly drier and less shady, and all ferns and moss are either gone or fast disappearing. But better evidence than enumerating instances of single streams or wet places having disappeared is to be found, I think, in the fact that some kinds of birds which are usually found only in drier localities than Coorg, and which used not to be found there years ago, are now becoming numerous in parts. The common meina is by no means rare now in the coffee estates in South Coorg. This bird has only come there of late years, and this shows that the climate has altered, and must be far more dry than it used to be.

(3) "*or wells or the subsoil.*" I am not able to speak from experience.

(4) "*or the denudation of the surface soil so as to render it unfit for cultivation.*"

When a planter takes up virgin forest he finds a splendid soil, covered with humus; he fells his forest and puts down his coffee. One has only to read the numerous letters that appear in the public prints, especially those of Ceylon, which are almost entirely kept up by planter subscribers, to see how a planter's mind is exercised as to how to keep his soil from being washed away. Look at the abandoned estates between Virajpett and Wotakuli in Coorg. Years ago the hills carried high timber forests on a rich though shallow soil on rock. But the forests attracted rain, regulated its distribution, and prevented scouring. The planter's axe levelled the trees with the ground, and now almost every planter who can get away from the place is glad to go. I do not think the rainfall is less, but the soil has gone from the hill sides. A tangled mass of weeds and jungle is springing up, and years must pass before the soil can be renewed. In Mysore, I could point to an instance where the felling of 300 acres or so of a forest for coffee resulted in the same way.

"*Can you adduce any direct evidence that any such injury as you think has been caused by the clearing of forest has been remedied by its reproduction?*" As reproductive measures are what is wanted, this question is necessarily difficult to answer. But I can adduce the present state of the Devaroydroog State Forest as showing how the growth of trees during 10 years has improved soil, distributed water, increased the area of land fit to carry vegetation. It is most cheering to mark how soil is gradually creeping up on what a few years ago was bare rock. In the fuel plantations of Nundydroog large bare patches of soil are now either carrying trees or are covered with grass owing to the proximity of trees.

Chap. I. Qn. 2.

Rajputana.

RAJPUTANA.

Mr. Saunders.

Ajmere.—There is no doubt that within the last 50 years there has been great denudation of scrub jungle. It is, however, surprising how quickly it recovers itself. Five years' conservation has already made a visilbe difference in the hill sides, while springs which were ceasing to yield water in the hot weather are now perennial. The history of our attempt at reboisement at an average cost of Rs. 20,000 per annum for the last 50 years has been repeatedly reported upon, and the Inspector of Forests, after an absence of five years, has revisited the spot, and informs me he is satisfied with our success and economy. The experiment may, therefore, be considered satisfactory, for even the villagers, who at first most strenuously opposed us, are now on our side; this result has only been obtained by careful consideration of the requirements of the people and an absence of harshness in enforcing the forest regulation.

Mr. J. White.

The reproduction of forest on a considerable scale is still an achievement of the future; but where, as in parts of Merwára, the reserved tracts are well advanced, there are signs and symptoms that the results which are naturally to be expected are even now appearing. Water appears in hollows and nullahs, where it has not been wont to accumulate, and the runnels and springlets that appear in the rainy season continue to flow much longer than they used to do. My answer to this question is that 93 square miles of hilly ground are now under direct conservation, and that it is hoped that Government will find it possible to extend this area before long very considerably. Extreme care has been taken to avoid injuring the interests of the people, and the forest law provides that the villagers, who formerly enjoyed the privilege of indiscriminate grazing and felling, shall now receive a large proportion of all net profits accruing from forest conservancy. It is hoped that within a few years it will be possible to declare a dividend in some tracts; in fact, it would be possible to do so at once in some of the tracts in Merwára; and this once done afforestation or reboisement will naturally become extremely popular, and the good example set by Government will doubtless be followed by many of the wealthier istimrárdárs, who now only preserve their jungles for the sake of the wild hog, their favourite game. The chief difficulty encountered in this matter of extension of the protected area lies in the fact that the people are still semi-pastoral, and have been long accustomed to graze their enormous herds of goats and of undersized horned cattle over the hills without any sort of restriction. If half this grazing area be fenced in and protected, it is not sufficient to say that they may come and cut the grass. One man can herd 100 head without difficulty, but it would take 50 men to cut and carry the grass for so many. For the first few years of conservancy there can be no doubt that the villagers suffer inconvenience, but after that time they are amply recouped by the immense increase in the quantity of the grass and improvement in its quality. From a forester's point of view this grass cutting is, of course, most undesirable, but we have not found it possible to forbid it, and the probability of arson is never a remote one. During the late severe scarcity the value of the reserved tracts was freely admitted by the people.

Central India.

CENTRAL INDIA.

Mr. Wingat

In Bhopal, Colonel W. Osborne says, there has been no denudation.

Baghelkhand.—With the unreliable data at present in his possession, Lt.-Col. Bannerman is not in a position to answer this para. satisfactorily; but he should say that, looking to the very extensive area over which forest extends in Rewah, although denudation has occurred to a limited extent, still local wants and exports are so limited that he does not consider any of the injurious effects referred to in sub-para. 3 have been the result.

In the Rewah forests (some of the finest in India at present) conservation ought to be, and is to a certain extent, maintained. Interference of some sort seems unavoidable; and although the State claims the absolute right to those forests, it had better be done, as far as possible, with the consent of the parties, who although they may not have a valid claim, have, from the apathy of the durbar, enjoyed a right to a great deal of their produce.

In Rutlam, Mir Shahamat Ali thinks, the consumption of firewood calls for attention.

CHAP. I.
NS. 24, 25.

CHAPTER I.—QUESTIONS 24, 25.

Can any estimate be made of the number and proportion of deaths which are the inevitable consequence of famine, not being due directly to starvation, but to such privations as adults in health can bear with safety, but which prove fatal to children or the old and sickly, or to such diseases as follow in the train of famine, from eating unwholesome food, roots, berries, leaves, &c., or arise from other and obscure causes, like cholera and fever, commonly concomitant on famine? What statistics exist as to past famines to show the depopulation that they have caused, and how far it is due to an increased death-rate, to emigration, or to a decreased birth-rate? If any special census was taken after the famine, state whether any trustworthy information was obtained as to the different classes of population which have suffered most; whether the early stages of a famine affect certain classes more or less severely than its later stages; whether the loss of life has been greater among males or females, among adults or children; to what extent the birth-rate has been affected; and how far local influences, peculiarities of administration, or tenure, climate, soil, water, density of population, systems of cultivation, &c., have tended to mitigate or intensify the inevitable effects of scarcity.

If no such census was taken, state what information is to be got from the mortuary returns for the period embraced by the last famine in your province, as compared with those for ordinary periods, and what conclusions may be drawn from those returns.

PUNJAB.

The Sanitary Commissioner reports that he is unable to furnish replies to these questions, as there are no statistics on record.

NORTH-
WESTERN
ROVINCES.

pt. Pitcher.

NORTH-WESTERN PROVINCES.

These questions, which may be conveniently coupled, embrace the following points:—

(1.) An estimate is asked for of the number of deaths in a famine year directly or indirectly due to starvation.

(2.) Statistics showing depopulation resulting from past famines.

(3.) If any census was taken after any of the past famines, what conclusions can be drawn therefrom?

(4.) If no such census ever taken from which conclusions can be drawn, how far do the mortuary returns supply the void?

The Sanitary Commissioner, as custodian of mortuary returns, embracing the scarcities of 1868–69, 1873–74, 1877–78, should give the most pertinent replies to these questions. The Sanitary Commissioner, however, distinctly affirms as his opinion regarding point 1 that no such estimate can be furnished, and, further, that to form such estimates is impossible. And as regards No. 2, that no statistics are available.

Adverting to point 4, the Sanitary Commissioner comments on the mortuary returns from January to June 1878, pointing out that while the mortality for the whole of 1876 was registered at 21·9 per mille, and that for 1877 at 19·6 per mille, the mortality for the first half of 1878 was registered at 39·1 per mille. Eliminating deaths from cholera and small-pox, and taking the returns for 1877 for comparison, the Sanitary Commissioner puts down the excess of 1878 over 1877 at 318,470, "to represent the mortality resulting from the prevalent distress."

It does not seem clear why, when 1877 was a more healthy year than 1876 (which latter was in no wise a famine year), the comparison should have been taken with 1877 rather than 1876, and why the excessive cold of December 1877, January and February 1878, and the increased activity in reporting, should, as factors, have received no notice.

With regard to the ages of those who died, the figures show that children and old people suffered more than infants in arms and adults.

The opinions of the various civil surgeons on the whole coincide with that of the Sanitary Commissioner as to the impossibility of forming a correct estimate under headings No. 1 and No. 2. Civil surgeon of Rai Bareli suggests, like the Sanitary Commissioner, that the difference in ratio between 1877 and 1878 may be taken as the per-centage due to famine. For this estimate to be of any value it must first be proved that the returns of the year taken for comparison, whether it be 1877 or 1876 are even approximately correct, a point which a reference to the appendix to the Basti report, giving the deaths' report from injuries for 1877 and 1878, must leave in considerable doubt.

All are agreed that the mortuary returns of 1877–78 show a remarkable increase over those of 1876–77, and that every district shows a large increase of male over female deaths and of juvenile and aged people over infants in arms and adults, but no one offers any reasonable explanation of these facts. The civil surgeon of Agra and the collector of Moradabad notice that the birth-rate during the scarcity exceeded the birth-rate of former years. This increase points, I think, to increased zeal in reporting.

The rate of increase due to famine has been rendered less easy of determination on account of the severe epidemics of small-pox and of fever which have prevailed, and have visited rich and poor alike, while unusual cold and rain out of season proved fatal to many who might otherwise have tided over hard times. Many people able to earn wages sufficient to purchase food were unable to purchase a sufficiency of clothing. Insufficiency of clothing probably turned the scale as against the aged and juveniles, adults having more vitality, and infants in arms benefiting from their share in the clothing and body warmth of their mothers.

The excess of male over female deaths may be accounted for by the known dislike of villagers to having their female relatives referred to in any way, and consequently to having their deaths reported. Other theories have been advanced by the civil surgeon of Sahárunpur as to women finding protectors, and by the Assistant Commissioner of Rae Bareli as to women requiring less food than men, which latter seems the most reasonable.

The civil surgeon of Agra draws attention to a feature of the returns which is most deserving of notice. It seems that while in Agra relief works and poorhouses were organised on a large scale, none such were organised in the adjoining districts of Aligarh and Etáwah; yet though the price of grain in these latter districts was but one seer lower than it was in Agra, the mortality was no higher. From this doubts are imported as to whether Governmental relief really lessens the mortality inevitable on high prices, and whether, if zemindars were helped by remissions or suspensions of revenue, and held responsible for feeding those dependent on them, the result would not be at least as satisfactory as the present system. The paragraph is worth attentive consideration.

Capt. Pitcher.

Of the district officers there are only eight or nine who have given us the benefit of their views on these questions, and Jhánsi is the only district which attempts to supply some estimate of the deaths due to famine in past years. The Deputy Commissioner, quoting from the returns for 1868–69, gives 27 per mille in excess of the ordinary rate as the rate due to famine, remarking at the same time that the proportion of deaths due to direct starvation is probably very small. As regards the past season, he observes that the deaths have been yearly increasing since 1875. In Bari Banki the increased death-rate prevailed from November to March, corresponding to the period of intense cold, while after March it fell to the usual rates. The grain rates for Bari Banki have not been supplied, but from those for the adjoining district of Fyzabad I find that wheat sold in September at 12 seers 1 chittack, in October at 11 seers 10½ chittacks, in November at 11 seers 14 chittacks, in December at 11 seers 12 chittacks, in January at 11 seers 1½ chittack, in February at 10 seers 7 chittacks, and in March, when the deaths were greater than in either November or December, at 12 seers 13½ chittacks per rupee. The Lucknow Deputy Commissioner points out that excessive cold, an extraordinary visitation of small-pox, abnormal activity and energy in the matter of reporting deaths, and want, combined to raise the returns.

The Rohilkhand returns exhibit for the winter months of 1878 a very marked increase in bowel complaints. From the collector of Budaun's report it would appear that the peasantry, accustomed in all years to supplement their diet of grain with the young leaf of the grain crop, with a weed called batua, and other green food, took this year, when grain was dear, to eating these weeds, &c. in unwholesome quantities, hence the fatal and great prevalence of bowel complaints.

The Assistant Commissioner of Rae Bareli writes at great length on these questions, giving numerous tables. His conclusions as to age and sex are much the same as those of the Sanitary Commissioner, but I think his estimates of the number of deaths due to famine are rather fanciful. He gives the average for three years of deaths from "all other causes," and then places the excess of 1877–78 over that average as due to direct starvation, leaving no margin for excessive cold or increased activity in registration. This last point is a most important one in framing estimates of mortality. In my replies for Basti I have pointed out that as a rule the deaths from "all other causes," compared for the same month in each year from 1875, increase in each year. The same may be noticed in the returns for Agra, which are appended, and the same may be noted in the Rae Bareli returns drawn out by the Assistant Commissioner. This steady progression in a series of numbers, and the increase shown in the birth-rates during the late scarcity, can be due to improved registration alone.

So also as to fever and small-pox, the increase under those heads is attributed by the Assistant Commissioner to starvation, which is scarcely admissible. As I have elsewhere noted, small-pox increases apparently in virulence as the subsoil water falls. Fever is raging at the present time of writing from Calcutta to Peshawar, affecting places which have and which have not suffered from famine. Grain is no longer at famine prices, yet in Agra thousands have died, rich and poor being alike affected.

The collector of Moradabad is the only officer who has given food-rates in juxtaposition with mortality-rates, a comparison most necessary when the connection has to be traced. The conclusions of that officer may be quoted :—

"It will be observed that the period of the greatest mortality was coincident with the time of the greatest cold, the price of food remaining tolerably constant from September 1877 to March 1878.

There are three districts left, Jaláun, Mirzapur, and Kheri, in which, strange to say, the mortality during the late period of scarcity was considerably less than in the previous year. For Jalaun this is said to be due to extensive emigration; for Mirzapur an unusually severe epidemic of cholera in 1876–77 is made answerable for the difference; while in Kheri it is supposed that, less rain having fallen, fever was not so prevalent as usual.

Figures, however, to support these various suppositions are not given.

Dr. Planck.

I do not think any estimate can be made which shall provide any near approach to the truth as a statement in regard to the proportion which the four causes of death mentioned as prevalent during a time of famine (namely, starvation, privation, hurtful effects of unwholesome food, and disease proper) each bear to the total excessive mortality resulting from famine prevalence.

Indeed, I do not think it can be possible ever to frame such estimate, because in so many cases two or three, or even all four, of the death causes mentioned operate together in the same individual in bringing about a fatal termination to the period of suffering.

II.—No such statistics are in existence as regards past famines in these provinces.

Perhaps a loss of 12 per cent. of the population may be looked for as the result of an extended period of famine prevalent over a wide area of country, the loss being due to all three causes mentioned—excessive mortality, emigration, and decreased birth-rate ; but in what ratio of each I cannot say.

In this province a period of distress approaching to famine has been experienced during, at least, the last six months, January to June 1878, inclusive; and now the escape from famine during the coming year depends entirely upon the sufficiency and favourable distribution of the rainfall of the present season, so far favourably recorded in most portions of the province. Being in the midst of the difficulty, no census operations can yet be possible or useful. But I think the information contained in the mortuary returns of the period mentioned merits attention, though little of accuracy is claimed for the results recorded.

During the year 1876 a total of 937,490 deaths from all causes was recorded in the North-Western Provinces and Oudh, the ratio per 1,000 of population being 21·94.

During 1877 the total was 840,538, the ratio per 1,000 of population being 19·67.

For the six months, January to June of 1878, a total of 836,054 deaths has been recorded, being in the annual ratio of 39·13 per 1,000 of population.

It appears, then, that the mortality of the last six months has been comparatively very great, and to those who have seen much of people during this period there can remain no doubt that much of the excessive mortality recorded has been due to distrest and disease, the result of insufficient nourishmens. I need scarcely say that the mortuary record takes no separate note of deaths resulting from starvation. If provision had been made for such separate record, I believe, as the result of conversation with many police inspectors who immediately control and observe the registration, that many deaths would have been recorded under that head.

At the same time it is necessary to say that all the excess of mortality recorded during the first six months of 1878 has not been due to insufficient nourishment, for there has been during that period a record of unusual mortality from small-pox. It is possible that children who are ill-nourished may be more prone to die from attack of small-pox in years

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Dr. Planck.

of scarcity. But that is quite uncertain, and the excess of deaths from small-pox may with propriety be eliminated from the total excess of mortality recorded, the remainder being taken to represent the mortality resulting from the prevalent distress.

Prepared on this basis, the record presents the following aspect:—

For the first six months of the year 1877 the total mortality recorded in the North-Western Provinces and Oudh was 388,676. In the first six months of 1878 it was 836,054. The difference is 447,378. For the same six months of the year 1877 mentioned the deaths from small-pox recorded were 18,676. For the first months of 1878, 147,584 deaths were recorded from small-pox. The difference is 128,908, which, deducted from the total excess of mortality, leaves 318,470 deaths attributable to the abnormal conditions resulting from famine prevalence.

In regard to the portion of the population which has most suffered, the records of age at death throw some light.

Thus for the two years 1876 and 1877 the average age at death was thus recorded:—

Ages at Death recorded in 1876 *and* 1877.

Year.	Infants less than one Year.	Boys and girls from 1 to 14 Years.	Adults 14 to 40.	Old Persons above 40.	Total.
1876 - -	228,798	210,231	232,514	265,947	937,490
1877 - -	234,157	194,439	180,287	231,651	840,538
Average -	231,482	202,335	206,400	248,799	889,014

For the first six months of 1878 the age at death has been thus recorded:—

Age at Death recorded in first six Months of 1878.

Infants.	Boys and Girls.	Adults.	Old persons.	Total.
206,219	222,205	153,927	253,703	836,054

Taking the average of the two years 1876 and 1877 to fairly represent the normal ratio which the different ages at death bear to the total mortality, by comparing the figures of the two tables a very considerable departure from the normal ratio is noticeable in regard to the ages at death for the first six months of 1878, and this will be more clearly and immediately apparent by a statement of proportions.

Thus, the normal ratios provide the following proportion of ages in every 1,000 deaths:—

Infants 261, children 228, adults 232, old persons 279.

Whilst for the six months of 1878 every 1,000 deaths are thus apportioned: infants 246, children 266, adults 184, old persons 304. Placed side by side the figures have this appearance:—

Age at Death.	Proportion to 1,000.	
	Normal.	First six Months of 1878.
Infants - - - - -	261	246
Children - - - -	228	266
Adults - - - -	232	184
Old persons - - - -	279	304

And it may be seen that the increased mortality has been borne in greatest measure by the children and old persons.

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Mr. Toynbee.

There are no records or reports from which any estimate can be made of the number and proportion of deaths which are the inevitable consequence of famine, but which are not due directly to starvation, but to such privations as adults in health can bear with safety, but which prove fatal to children or the old and sickly; or to such diseases as follow in the train of famine from eating unwholesome food, roots, berries, leaves, &c.; or which arise from other and obscure causes, like cholera and fever, commonly concomitant on famine. Such statistics as exist showing the depopulation past famines have caused in this province are given on page ; but as no special census was taken either after the famine of 1866 or after that of 1874, no accurate replies can be given to the remaining portion of question No. 24.

Although registration in Bengal was in its infancy in the first five years of the present decade, a certain amount of information can be obtained from the mortuary returns for the famine year 1874. The deductions to be drawn from these returns are supported by the statements made in the Sanitary Commissioner's annual reports for 1874, and in the annual sanitary reports for 1874 from several districts where extensive relief operations were undertaken. In the statement alluded to a summary is given of the ratios of deaths per 1,000 of population in the worst famine districts of 1874 from cholera, small-pox, fevers, bowel complaints, and other causes for the three years 1873, 1874, and 1875. It will be seen that the grand total of deaths from all causes in Behar and Northern Bengal was 6·43 per 1,000 in 1874 against 7·33 in 1873 and 8·13 in 1875. The year 1873 was one of the early years of registration, and probably a very small proportion of the actual deaths occurring were registered. It is presumable that in 1874, owing to the large staff of officers scattered throughout the districts supervising famine relief, registration of deaths was better effected than in the preceding year. Taking the individual headings, we find that in Behar the death-rate from cholera in the famine year 1874 was only 0·26 against 122 in 1873 and 1·06 in 1875; in Northern Bengal the death-rate was 1·10 in 1874 against 0·57 in 1873 and 1·61 in 1875, the total for the whole of the famine districts being 0·49 in 1874 against 1·04 in 1873 and 1·21 in 1875. With regard to small-pox the two years 1873 and 1874 showed nearly the same ratio of mortality, while 1875 was a year of general low death-rate from the disease. Again the death-rate from fevers in 1874 in nearly every famine district was less than that of 1873, the grand total for all the famine districts being respectively 4·57 in 1873, 4·27 in 1874, and 5·32 in 1875. From bowel complaints the ratio of deaths in Behar was less in 1874 than in 1873 or 1875, and only slightly greater in Northern Bengal. As bearing generally on the subjects raised in questions 24 and 25, the following observations by Dr. Coates relating to the famine districts visited by him, as recorded in the annual report of 1874, are reproduced:—

"A short abstract of the observations noted in my former and latter tours through the famine districts is as follows:

"In the former, begun in May, Burdwan, Tirhoot, Chumpárun, North Bhagulpore, Purneah, Julpigoree,

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Rungpore, Dinagepore, and Maldah were visited; in the latter, starting in August, Hooghly, Burdwan, Moorshedabad, Rajshahye, Bhagulpore, Monghyr, Tirhoot, Chumpárun, and Chuprah were gone through.

"In the first I found Ramnuggur in North Chumpárun, Madhubunni in North Tirhoot, and North Bhagulpore, and North Purneah to be the worst districts as regards disease and condition of the people. Here there were extra bowel diseases, dropsies, sloughing ulcers, the presence of pregnant women in the hospitals, and orphans or deserted children in the poor-houses; in all the other districts the people were largely anæmic, and more emaciation also prevailed. In the former, particularly Madhubunni and North Bhagulpore, the able-bodied men had in the cold weather gone away to seek labour and food. I was told they chiefly crossed the Ganges to the Monghyr side to obtain work in cutting the rabi crops there; they thus left the women, the old, the feeble, the young, and the diseased at home. The stronger of these crowded our relief works; the others remained in their homes or sought food in poor-houses. These places were farthest away from large towns and main roads; they were thus more isolated and difficult of access, and hence it was, I believe, that their previous want affected them so much and so long. In these out-of-the-way villages I found 50 to 75 per cent. of the people anæmic and emaciated; nearer to large towns and main roads there were 15 to 25 per cent. so affected, while in the sudder stations these were under 10 per cent. The planters, zamindars, and villagers were loud and unanimous in their opinion of the necessity there was for the free distribution of rice to the people. They told me that, before the golas were opened, the people had begun to collect together to call on those zamindars who they supposed had rice in store, begging for food; and threatening that, if it was not distributed, they would burn the stores in question. Messrs. Tripe and Gibbon, of North Tirhoot and Chumparun, stated that these fires had begun, and that they quite ceased as soon as the Government golas were opened. Except a few accidental village-hut fires, none were afterwards heard of. That pregnant women, unable to work for their food at our tank, road, and bund-making works, and unable to get food any other way, were forced into our poor-houses, particularly in the Ramnuggur and Madhubunni circles, there to await their confinement and remain till fit for work again; and that orphans or deserted children should have sought refuge and sustenance in our hospitals, proved how real was the scarcity, how closely relief pressed on it, and how necessary it was that preparations for a large sickness and mortality should be rapidly completed. The people of Belsund, Bongong, and Pooprее, and the planters there, told me that but for the measures adopted by Government a greater mortality than that of 1866 would certainly have occurred this year among the people. They said that cholera and dysentery followed on the people eating bad and insufficient food, and that during the five months that ensued on the failure of the rabi crop that year at least three out of four in every village there died; some of the villages were entirely deserted, and many of the dead remained unburied. This fact and the presence, in this northern tract, from Ramnuggur to Purneah, of sloughing ulcers, dropsies, and extra bowel diseases, made us run up a double set of hospitals in every circle—one for ordinary, and one for contagious, diseases. The medical department pushed in an ample supply of medicines, which were divided into three—one lot to be massed in the head-quarters stations, one to be sent to out-circles, and a third to be carried about by native doctors from village to village. Native doctors were obtained abundantly from all parts, Madras on the one side to Punjab on the other, and distributed where the need was greatest. Six extra English surgeons, too, were specially deputed to the subdivisions or districts where pressure was greatest. The insanitary state of relief centres and great works of towns and villages was pointed out, and remedied as fast as possible. Here I must revert to the outlying villages to which there were no roads, only field paths interrupted by streams and nullahs, and therefore difficult of access; in these were left the old, the feeble, and the diseased. Here it was that the plan of sending the food direct across country, and distributing it in every village where want or suffering showed itself, met an urgent difficulty, and prevented an amount of disease and death that must have been very great and would probably have been little heard of. It was in these villages, deserted by the able-bodied, that I found as far as 75 per cent. underfed, and that the food distribution was most important and most beneficial. It was here that the native doctors did most good; they went from house to house, treating the sufferers in their own homes, and when cholera or small-pox showed itself the surgeon of the district or subdivision was soon on the spot; extra native doctors were quickly at work, and each case was separately treated and stopped on the spot where it arose. Cholera broke out in every one of the distressed districts, yet in no instance did it become a general epidemic. Wholesome food and prompt treatment prevented its spread. The Royal College of Surgeons at home, anticipating as large an amount of sickness and mortality as in previous famines, desired a special deputation of scientific medical officers to investigate the condition of the people and the extraordinary sickness and mortality ensuing on the scarcity. A circular, suggested by the Sanitary Commissioner with the Government of India, was sent to every civil surgeon in Bengal, calling for a weekly report on the health of the people, that, in the event of extraordinary disease appearing, he and Dr. Lewis or Dr. Cunningham might at once visit, examine, and report on whatever disease or condition prevailed. No such investigation turned out necessary; the civil surgeons made but one report all the season through, which may be thus epitomised:—'No scarcity unrelieved, therefore no extraordinary 'sickness. Cholera in sporadic form mastered in its 'own homes. No deaths from starvation. Health 'of the people improving or better than usual.' The deputation, therefore, never came. In the visit to the districts previously noted and now just completed, I found no pregnant women in an hospital or poor-house in the places where they had been previously; where sloughing ulcers had been, now those that remained were healing; no one was gangrenous. These are proverbially slow of recovery. Fevers, cholera, dropsies, and bowel diseases had decreased to an unusually small number in every district, but, more extraordinary still, the endemic fever that had for years past broken out every August in Burdwan, Hooghly, and Bankoora is so far entirely absent. Though enfeebled by previous disease, not only was want, but also special disease, prevented by the timely and free distribution of food, fortifying and protecting the recipients against the malaria from which they in previous years succumbed so largely. Our many extra hospitals have been little used. Had we had the usual amount of rainfall in July, August, and September, and had the diseased and emaciated not been fed and treated in their own village homes, but been allowed to crowd into our central hospitals, no matter how much and how carefully these had been organised and attended to, an enormous increase of disease and largely fatal results must have ensued. In my last round through the worst, or what had been the worst, parts of Tirhoot and Chumpárun, I found the people averaging six per cent. anæmic, and in the centre stations four per cent.—a condition which I consider is better than their usual health. It must be admitted that the gangs of the poorest had then been broken up, and the worst cases had separated each to his own village. The planters and people acknowledge, however, that they could not remember a year when the villagers had been so healthy and

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when sickness and mortality had been so little, and attributed it to the full and perfect arrangements for feeding the poor and those wanting food. Cattle disease, too, was unusually absent. The people of Dinagepore and Rungpore, feeling the scarcity last cold weather, had sold about half their cattle at half the usual prices to men who come for this purpose from the districts further eastward, expecting large numbers at cheaper rates. In these districts the cattle were healthy. In Tirhoot, where the bullocks were hard worked, massed together, and exposed to all weathers, small-pox or gooti did break out, particularly about Poosah; those that died were buried, the rest were isolated and recovered. The mortality was inconsiderable. There is thus abundant evidence to show that the famine year of 1874 in Behar and Northern Bengal was a year of smaller mortality than usual and of improved general public health."

Statement showing the Mortality of 1874 compared with that of 1873 and 1875.

Circles.		Population.	Area in Square Miles.	Ratio of Deaths per 1,000 of Population from—																	
				Cholera.			Small-Pox.			Fevers.			Bowel Complaints.			Other Causes.			All Causes.		
				1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.	1873.	1874.	1875.
Behar	Patna	1,559,638	2,101	1·61	·29	1·32	·27	·15	·12	3·09	4·29	4·68	·97	1·29	1·32	1·59	1·85	2·09	7·65	7·91	9·57
	Gya	1,949,750	4,718	2·23	·14	1·79	·39	·31	·11	5·75	4·39	6·57	·79	·52	·61	1·39	1·04	1·24	10·57	6·42	10·34
	Shahabad	1,723,974	4,385	2·72	·03	·78	·47	·55	·04	6·02	5·93	5·64	·41	·22	·21	·59	·64	·55	10·23	7·41	7·24
	Mozufferpore	2,188,382	2,969	1·42	·20	1·40	·14	·11	·07	1·83	1·93	2·31	·60	·53	·52	1·05	1·18	1·52	5·06	3·97	5·8
	Durbhunga	2,196,324	3,374	1·32	·08	·88	·16	·09	·10	1·81	1·69	1·65	·39	·25	·26	·88	·90	·82	4·58	3·03	3·74
	Sarun	2,063,860	2,654	·85	·23	·40	·58	·34	·04	4·08	2·77	2·69	1·22	·78	·90	3·12	2·71	3·26	9·83	6·85	7·31
	Chumparun	1,440,815	3,531	·84	·29	·36	·21	·62	·05	3.14	2·09	2·66	·61	·37	·45	·73	·85	·81	5·55	4·25	4·36
	Monghyr	1,812,986	3,913	·73	·39	1·43	·30	·48	·20	6·07	6·90	6·21	·36	·39	·37	·82	1·04	1·09	8·30	9·22	9·3
	Bhagulpore	1,826,290	4,327	·49	·61	·94	·28	·08	·04	3·50	3·52	4·16	·08	·07	·12	1·20	·97	1·17	5·59	5·28	6·43
	Purneah	1,714,795	4,957	·50	·08	1·44	·06	·04	·10	4·25	3·94	9·45	·16	·10	·18	·36	·27	·30	5·35	4·46	11·49
	Sonthal Pergunnahs.	1,259,287	5,488	.37	·73	·79	·42	·43	·19	7·55	6·67	7·02	·30	·38	·36	1·08	1·36	1·18	9·74	9·60	9·58
	Total of Behar	19,736,101	42,417	1·22	·26	1·06	·30	·28	·09	4·13	3·86	4·65	·55	·44	·48	1·20	1·18	1·31	7·41	6·05	7·62
Northern Bengal	Julpigoree	418,665	2,906	·04	·14	3·22	·12	·03	·002	4·24	3·63	3·85	·20	·23	·17	·65	·84	·98	5·27	4·89	8·25
	Dinagepore	1,501,924	4,126	·35	·29	·84	·02	·02	·01	4·68	3·06	5·92	·08	·05	·11	·32	·46	·39	5·41	3·89	7·29
	Rungpore	2,149,972	3,476	·19	·59	2·63	·02	·02	·0004	3·10	3·06	2·86	·10	·10	·05	·39	·52	·32	3·81	4·35	5·88
	Maldah	676,426	1,813	2·05	·55	2·53	·17	·39	·21	12·02	8·86	13·08	·14	·09	·05	·65	·66	·56	15·09	10·58	16·46
	Rajshahye	1,310,729	2,234	·46	1·99	·95	·02	·07	·02	4·64	4·15	6·04	·06	·04	·05	·60	·77	·74	5·79	7·04	7·81
	Moorshedabad	1,353,626	2,578	·98	2·54	·53	·65	·69	·09	9·44	11·43	14·25	·17	·31	·29	·77	·91	·94	12·05	15·91	16·14
	Total of Northern Bengal	7,411,342	17,133	·57	1·10	1·61	·16	·18	·04	5·73	5·35	7·11	·10	·13	·11	·52	·66	·59	7·10	7·44	9·47
	Grand Total	27,147,443	59,550	1·04	·49	1·21	·26	·25	·08	4·57	4·27	5·32	·42	·36	·38	1·01	1·04	1·11	7·33	6·43	8·13

Note.—During the famine of 1874 the following deaths were reported, and after inquiry ascertained to be due to actual starvation: viz., in Tirhoot 15; in Monghyr 2; in Bhagulpore 5; total 22.

Central Provinces.

Dr. Barter.

CENTRAL PROVINCES.

Births in the Central provinces are recorded at an average of 6·30 per mille of population per annum in excess of deaths for the 10 years 1868–77, the aggregate excess being 495,940. In 1869 only did the deaths exceed births. The aggregate excess was 75,405 in that year, and the ratio per 1,000 of population was 15·5 in excess of births; in that year there was famine, which was felt most severely in the Jubbulpore and Chhattisgarh divisions.

Registration of vital statistics during 1868 and previous years was not perfect; the following figures are, however, extracted from the Sanitary Commissioner's report:—

Deaths in the Central provinces in 1868 being returned at 16·50 per 1,000 of population, the following districts showed highest:—

Jubbulpore	29·0
Chhindwara	26·4
Bhandara	25·0
Seoni	22·9
Nagpur	21·2
Saugor	22·2
Bilaspur	17·7
Raipur	10·2

Mortality falling in 1869, per 1,000 of male and female population, at 35·9 in the provinces, the following are the highest district figures:—

	Male. Female. Total.
Jubbulpore	*38·1+25·0=6·31*
Damoh	*33·9+26·8=60·7*
Saugor	*31·3+24·7=56·0*
Bhandara	*23·8+2·09=44·7*
Bilaspur	*22·3+17·4=39·7*
Raipur	*20·6+16·0=36·6*

and in 1870 the totals fell to the following:—

Jubbulpore	23·5	Bilaspur	9·7
Damoh	21·2	Raipur	12·7
Saugor	21·0	Murwara	10·3
Bhandara	8·0		

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PROVINCES.

Dr. Barter.

The ratio for towns for 1868 is not given; that for 1869 is here extracted:—

Jubbulpore	Jubbulpore district.	123·3
Panargarh		101·3
Sehora		87·7
Garha		71·5
Mandla		102·8
Garhakota (Saugor)		90·7
Gadarwara (Narsinghpur)		82·1
Damoh		78·4
Bilaspur	Bilaspur district.	76·7
Ratanpur		62·6
Raipur		73·2

To cholera was due the heavy mortality in Seoni, Jubbulpore, and Mandla in 1868; 42, 27, and 27 being the ratios of cholera deaths per cent. of deaths from all causes; and to this disease and to small-pox, to fevers, bowel complaints, and to famine was due the heavy mortality in 1869*, which exceeded that of 1868 by nearly 100,000 souls.

The Sanitary Commissioner's statistics do not give deaths the result of famine separately; the following figures show to what mortality was due during the years 1868, 1869, and 1870:—

	1868.	1869.	1870.
Cholera	7,952	51,387	107
Small-pox	2,843	16,849	2,348
Fever	47,160	68,999	81,244
Bowel complaints	5,175	12,550	14,497
Other diseases	13,928	23,488	13,407

The rise from 13,928 in 1868 from "other diseases" to 23,488 in 1869, and the fall to 13,407 in 1870, would point to famine as the cause of the increase in 1869, but to what precise extent famine raised the mortality in 1869 I am unable to say; these diseases follow in the wake of famine or want.

Failure of crops was complete in some places and partial in others; the north-east part of the Raipur district suffered most, and the eastern part of Bilaspur. Relief works were started early. Accustomed to abundance of food, obtained by light labour, the people could not be induced to go 40 or 50 miles to work; they preferred semi-starvation on berries and other jungle produce to fair labour at a distance from their homes, and works had to be designed on the score of accessibility to the suffering classes.

Cholera broke out in these gangs in May, and committed great havoc. The return for the two districts show a mortality of 18,569.

The northern districts suffered from an influx of starving people from adjoining native states. Saugor, Damoh, and Jubbulpore were the districts chiefly concerned. In Murwara, the northern subdivision of Jubbulpore, failure of the crops was complete, and followed two bad years. As relief operations were taken in hand early, to this point flocked the starving from Rewah, Nagode, and Punna. The condition in which many of these emigrants arrived was very bad; reduced to the lowest state of exhaustion, many survived only a few hours, whilst others were unfit for work until after a protracted convalescence.

A table (B) is here given showing deaths in Saugor Damoh, and Jubbulpore, also in Raipur and Bilaspur in 1868–69 and 1870. This shows that the Jubbulpore district suffered most from the diseases more closely relating to famine, as bowel diseases and those undefined and grouped under "other causes." The losses from these two diseases were as follows in the three years:—

B.

Deaths.	Saugor.			Damoh.			Jubbulpore.			Raipur.			Bilaspur.		
	1868.	1869.	1870.	1868.	1869.	1870.	1868.	1869.	1870.	1868.	1869.	1870.	1868.	1869.	1870.
Cholera	256	9,295	—	—	2,285	—	2,940	3,796	25	3	9,349	—	4	9,220	—
Small-pox	238	5,434	1	63	2,014	9	398	2,372	59	123	400	273	193	495	66
Fever	5,901	8,605	7,759	1,474	2,441	1,714	2,831	16,791	6,447	4,438	9,894	9,023	8,641	10,060	4,000
Bowel complaints	717	1,012	848	229	810	854	767	4,918	2,007	391	776	476	124	375	278
Other causes	2,731	2,924	1,491	573	1,406	874	3,691	8,684	1,377	813	912	713	77	776	89
	9,843	27,270	10,099	2,373	9,492	3,461	10,627	26,561	9,915	5,768	21,331	10,185	9,039	20,926	4,433

1868.	1869.	1870.
4,458	13,602	3,348

thus 10,000 in round numbers perished in excess of the deaths of a normal year from these two causes; the figures for the other districts mentioned are not so marked; those for the Saugor are—

1868.	1869.	1870.
3,448	3,936	2,339

and those for Raipur give no clue to the real mortality that took place there as the result of famine. Since that date the registration of vital statistics has been vastly improved.

Mortality due to privation.—The statistics at my disposal do not enable me to form any estimate of the deaths due to privation, as affecting "children or the old and sickly," but the figures I have just given, vide answer given at pages 96–98, show that about 10,000 in round numbers died in 1869 from diseases which are classed under the general heading "other diseases" in excess of the mortality of a normal year. It is probable that a large number of these deaths were due either directly to famine or to such diseases as follow in its train from eating unwholesome food. The deaths arising from diseases concomitant on famine, as fevers, cholera, &c., for the whole provinces are given in the foregoing answers under group 2. The total mortality for the provinces for 1869 is stated by the Sanitary Commissioner to be nearly 100,000 in excess of that for 1868, and the returns show that it was about 60,000 in excess of the mortality recorded in 1870.

Depopulation caused by past famines.—I have in my answers under group 2 given increased death-rates during the famine years. I have no statistics to show the extent to which emigration was resorted to; and the fluctuations in births and deaths for the 10 years 1868–1877 I give in the table annexed; this shows that there was a decrease of 7,606 births in 1869 with reference to 1868; that in the following year 30,112 children were born in excess of 1869; and that each of the following two years, 1871 and 1872, showed a still further increase in the births of 75,000. These are aggregate figures, but the averages in column 7 of the table bring the matter out more clearly; thus in 1869 deaths per 1,000 of population exceeded births by 15·5, due to a low birth and a high death rate; in 1870 the birth-rate had not recovered itself, and the excess of births over deaths fell at 2·20 per 1,000 of population.

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* Paragraph 45, Section II., Sanitary Commissioner's Report for 1869.

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ENTRAL
OVINCES.

r. Barter.

TABLE SHOWING BIRTHS and DEATHS in the CENTRAL PROVINCES for the TEN YEARS 1868–1877, inclusive.

Population under Registration.	Year.	Births.	Deaths.	Excess Births.	Excess Deaths.	Excess Births per 1,000 of Population.	Excess Deaths per 1,000 of Population.	Remarks.
1.	2.	3.	4.	5.	6.	7.	8.	9.
4,744,836	1868	107,199	78,389	28,810	—	4·90	—	
4,862,516	1869	99,593	174,998	—	75,405	—	15·5	
6,991,618	1870	129,705	114,423	15,282	—	2·20	—	
7,266,373	1871	204,820	117,964	86,856	—	12·00	—	
7,266,373	1872	204,809	181,387	23,422	—	3·22	—	Due to heavy mortality.
7,426,604	1873	224,210	139,617	84,593	—	11·39	—	
7,427,608	1874	259,492	174,446	85,046	—	11·45	—	
7,408,074	1875	261,906	195,023	66,883	—	9·02	—	
7,408,074	1876	291,757	225,024	66,733	—	9·01	—	
7,408,074	1877	290,859	177,139	113,720	—	15·35	—	
Total -	- -	- - -	- - -	571,345 −75,405	—	—	—	
				495,940 = 6·30 births per 1,000 of population in excess of deaths for the 10 years.				

BOMBAY.

Dr. Hewlett.

BOMBAY.

No accurate estimate can be made, in my opinion, of the number and proportion of deaths which are the inevitable consequence of famine, not being directly due to starvation but to privation or disease. Our system of registration of deaths is in its infancy, and is of course most inaccurate in every respect. The deaths are, by order of the Government of India, classed under one of the following six headings—cholera, small-pox, fevers, bowel complaints, injuries, all other causes. The registrars are too often ill-educated men, who possess no medical knowledge whatever. They are generally the kulkarnis (village, accountants), who do not reside in the village, but who periodically visit a given number of villages, and are informed by the patel, who oftentimes can neither read nor write, of the number of deaths that have taken place since the last visit of the kulkarni. With such an organisation, it, of course, happens that many deaths escape registry altogether, and that the causes of death are extremely inaccurate. I believe, however, that the causes of death under the headings cholera and small-pox are, with some margin, pretty correct. The rapidity with which death follows the attack in the one case and the symptoms in the other are so distinctive that, in my opinion, comparatively speaking, many mistakes do not occur. The returns under the heading "injuries" also may be accepted as comparatively speaking correct, but the returns under the heading "fever" are absolutely incorrect. Any disease accompanied by increased heat of body is classed under the generic name of *tap*, and deaths from pneumonia, pleurisy, and other inflammations appear under this heading. Under the heading "all other causes" would be included deaths from starvation and from anæmia, the result of long-continued privation.

MADRAS.

Dr. Cornish.

MADRAS.

This question, in regard to its first clause, cannot be clearly answered. An attempt was made by the Orissa Famine Commission to obtain the mortality under two heads: 1st, deaths directly due to famine; 2nd, deaths indirectly due to famine; but the failure was complete.

The registered causes of death are not in any degree trustworthy; but this much is certain, that in the famine areas the people died (in round numbers) in three times the proportion they did in non-famine districts during the year 1877. I have shown in my annual report for 1877, and illustrated by diagrams, that there was a very close correspondence between prices of food and mortality in the famine area; and as excessive mortality was confined to the famine area, or districts bordering thereon to which people fled for help, there can be no reasonable doubt that the excess mortality was famine mortality, and nothing else.

The use of the term "starvation" in this question is not clear. There are two distinct forms of starvation recognised by all authorities—"acute starvation," where persons are deprived for a time of all nutriment whatever; "chronic starvation," in which the daily food is insufficient in quantity or quality for the repair of the daily waste of the body. Acute starvation is a diseased condition admitting of relief if the victims are seen in time and judiciously treated. "Chronic starvation" which has continued so long as to cause severe bodily wasting is practically beyond remedy. It is the latter form of starvation that famine administrations have to deal with. Owing to a want of precision in description, non-professional persons have generally confused the results of the two forms of starvation. They have noticed that coal miners shut up in the works or shipwrecked mariners have recovered after being totally deprived of food for several days, and it has apparently been surmised that partial rations of food continued for weeks and months could be borne by the famine-stricken with impunity. History and physiological

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MADRAS.

Dr. Cornis

science give no warrant for such an opinion. In applying the term "starvation" in connection with famine, "chronic starvation" is always implied. This form of the disease is so much the worse than acute starvation that in the one case food judiciously given will restore health and strength, while in the advanced forms of the other the most costly of nutritious dainties are powerless to restore vitality. I have commented elsewhere on the want of precision in the use of the term "starvation."

I am not aware of any experience showing that adults in health can bear privation "with impunity" which proves fatal to children or the old and sickly. My personal experience went to show that in the early period of the distress the earliest victims were the old and the young of the labouring people. But, as these classes are not bread-winners, the probabilities are that they were the first to be stinted in their daily food. As the distress increased, and the food became more difficult to procure, the adult men and women broke down just in proportion to the degree of privation to which they had been exposed. All that can be safely stated in regard to the superior endurance of adults is, that, having a greater stock of vitality than the old, they necessarily can hold out for a somewhat longer period under an equal amount of privation; but our jail experience altogether opposes the notion that, even as regards these classes, they can bear "chronic starvation" for prolonged periods with impunity. At page 81 of my report of 1877 is given a table showing the mortality of the general population according to age, and it will be seen that the proportion of mortality of children from one to six years had increased from 29 per mille in 1876 to 58 in 1877; of children from six to 12 years, from 11 per mille in 1876 to 32 per mille in 1877; of adults from 12 to 50 years from 16 per mille in 1866 to 40 per mille in 1877; and of old people above 50 years from 67 per mille in 1876 to 166 per mille in 1877. Of all these classes of the population the proportion of increased mortality was lowest in children under six years of age. This, I suspect, was owing to the decreased population of young children from diminished births.

This clause of the question assumes as a fact that adults can bear a greater degree of privation than the old and young, but the experience of the famine and an analysis of the proportions of the populations returned as dying at various ages in 1877 does not entirely bear out the assumption.

In my opinion, it is only fair to debit all excess of mortality in famine areas beyond the ascertained mean of ordinary years to famine either as directly or indirectly connected with failure of food supplies. It is quite impossible to draw any line, and say, "This is a famine death, pure and simple," and of another, "This is a death indirectly due to the famine." Famine brings about so many abnormal conditions, *e.g.*, bad water, bad housing and clothing, promiscuous herding of the people on works, and exposure to communicable disease, that no one, however desirous of arriving at the truth, could satisfactorily classify the mortality in the way suggested. Thousands of persons, for instance, on relief works, fell victims to cholera, small-pox, and fevers who, if they had remained in their own villages and in their own occupations, with an adequate allowance of food, would probably have been alive to this day. Famine means agglomeration of the population under peculiar insanitary conditions as well as dearth of food.

MYSORE.

MYSORE

Colonel Peo

Their usual food grain is ragi; rice in ordinary times is never eaten by the Canarese-speaking people of this division, excepting in very small quantities. In fact, the poorer classes among the Canarese population of Mysore say unhesitatingly that rice does not agree with them. Now during this famine, and when it was just culminating to its severest time, the food of the poorer classes of the population, in consequence of the dearness and scarcity of ragi, was changed in about the space of one month to rice almost exclusively. In ordinary times I believe it will be admitted that such a change would have affected the health of the people very seriously, and therefore at a time when half the population were living on scanty fare, supplemented by all kinds of unwholesome food, the sudden change in their staple diet must have had the most injurious effect on them. The complaint, even among well-to-do people, was that the imported rice, which was of very inferior quality and dirty, brought on diarrhœa; and therefore it is more than probable that the fearful mortality of May, June, and July 1877 was due to this unavoidable change of diet, acting upon people debilitated and reduced by scanty and unwholesome food.

CHAPTER I.—QUESTION 26.

It has been laid down by the Government of India as a settled principle that local financial responsibility should be enforced in the case of a famine as far as possible. With this view special taxation has recently been imposed on the country, the proceeds of which the Government has proposed to apply as a mutual assurance fund which will be available for the benefit of the people on whom the calamity of famine may actually fall. But it has been recognised that it would be preferable if some portion of this taxation could be made more strictly local, both in its levy and its application to relief purposes. Can you suggest any way by which it might be rendered practicable to provide that where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefited by it under any system of (taxation in modification of or in substitution for that recently adopted and not in addition to it) in a manner that should bring into operation a sense of local responsibility, first in the direction of securing the lives of the people, and second of protecting them from unnecessary expenditure on relief? How could such a principle be applied to a smaller area than that of a province or presidency? Could the expenditure in a single district, or sub-division of a district, be recovered from that district or sub-division by such special taxation wholly or in part, or under any special circumstances, or in reference to any class of the community requiring relief, leaving a smaller or larger portion of the charge to be made good from the province or presidency at large, or from the resources of the Government of India? Could any plan be suggested under which, subject to similar limitations, a municipality might be required to bear the cost of feeding its own poor? What kind of special local taxation should be adopted for this purpose? What would be the probable effect (1) on the minds of the people, (2) on the temper of the officials, of the knowledge that the cost of famine relief expended on their behalf or by them would have to be recouped by local taxation? Is there any reason to suppose that the sense of local responsibility, if it could be brought to bear, would not operate beneficially in the case of relief of the distressed portion of the population in India?

PUNJAB.

Lieutenant-Governor.

2. This question, accepting the principle which has been laid down by the Government of India as settled, that local financial responsibility should be enforced in the case of famine as far as possible, is whether it be practicable to provide that, where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefited by it, under any system of taxation (in modification of or in substitution for that recently adopted, and not in addition to it), in a manner that should bring into operation a sense of local responsibility.

3. I am to observe that any opinion given in reply to this question must, from the nature of the case, be theoretical; as the taxation imposed as an insurance to meet famine expenses has been imposed, and is collected, as a part of the general taxation of the country, and may be used on emergency for general purposes, in accordance with the declaration in the speech of the Financial Member of Council, of the 9th February 1878, quoted at paragraph 283 of Financial Department Resolution, No. 1249, of the 13th March last.

4. The question further states that it has been recognised that it would be preferable if some portion of this special famine taxation should be made more strictly local, both in its levy and in its application to relief purposes. But the Lieutenant Governor holds that, in its levy, it is impossible that it should be more local than it is at present: the enhanced land rates, and the License Tax of 1878, are distinctly local; they include in their operation all those who contribute towards Government land revenue, and the trading and artisan classes. There is scarcely anyone able to pay at all, with the exception of the official classes, who is exempted from them, and it is clearly impossible to make any taxation which is collected in anticipation, by way of insurance against famine, more local in its collection than these taxes are. In its application, the proceeds of this special taxation may, it is true, be made more local; but, with regard to the establishment of a separate fund, the policy of the Government of India has been authoritatively declared in paragraph 283 of the Financial Department resolution before quoted. It was there held impracticable to form a separate fund from the produce of the new taxes, by law set apart strictly from the general revenues, and only to be applied to specified purposes; seeing that if any sudden change of circumstances arose, calling for seriously increased expenditure or causing a considerable falling off in the revenue, the Government would have to choose between the imposition of fresh taxes and the abrogation of the law constituting the fund.

5. Such being the declared policy of the Government of India, and questions of Imperial taxation and the expediency of particular methods of raising a required revenue being beyond the scope of the labours of a famine Commission, whose discussions, where the policy of Government has been distinctly declared, can have little more than a speculative interest, the Lieutenant Governor is not prepared to suggest, as he would otherwise have been disposed to do, the formation of a provincial famine fund from the proceeds of special taxation. From the provincial or district point of view, this would be, no doubt, an advantage; but it would bind the hands of the Government of India in a manner in which they have declared that they will not be bound. Yet, from the local standpoint from which the Famine Commission have apparently viewed the subject, and in answer to the question asked, his Honour has little doubt that it would be advantageous to invest, year by year, the proceeds of special famine taxation of each district in interest-bearing securities, drawing upon them, as occasion required, for the relief of extraordinary distress, or of famine when it occurred. A certain contribution, which might be 20 or 25 per cent., should be withdrawn each year from the receipts of all districts into the common fund for the construction of works protective against famine, such as canals, roads, or railways, designed and carried out under the orders of the Local Government, after having, if necessary, obtained the sanction of the Imperial Government.

6. The proper proportion would be credited to municipal or district committees, equivalent to the amount of special taxation imposed upon them; and the employment of the fund on ordinary famine works, or on the relief of extraordinary distress, should be left to the district and municipal committees. In this way alone does the Lieutenant Governor anticipate that the taxpayers would have confidence that the money collected by taxation for the relief of famine was really applied to that object.

7. With reference to that part of the question which inquires whether famine expenditure should be recovered from the district in which it has been incurred, I am to observe that the Lieutenant-Governor is

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PUNJAB.

The Lieutenant Governor.

opposed to any specially local taxation, as unsuited to the habits of the people, and as likely to increase selfish exclusiveness. The application of such a plan would, moreover, cause considerable interference by Government officials, which would be exceedingly distasteful to the people. It is impossible without a poor law and a law of settlement to localise famine taxation and relief on anything like a parochial or union system, as suggested by the Famine Commission; while any approach to a parochial system must tend to check the stream of private charity Hitherto, and until the system of State interference dislocates the habits of the community, the Indian custom has been, and will be, for each town or village to support its own poor; while professional and religious mendicants are supported by the common charity. This system necessarily breaks down in the presence of a true famine; but all measures of relief, under such circumstances, must collapse without the direct interference of the Imperial Government, drawing famine funds from the general treasury, or from the surplus resources of such provinces as are unaffected by famine. The proposal to localise insurance funds would virtually amount to the creation of a poor law, and their distribution would have to be confined by strict rules to those times only when distress, in the opinion of the Local Government, had become so intense as to be too severe a strain on private resources. It would be in every way undesirable to discourage private charity, which is in India as large and conspicuous as in any country in the world.

8. These remarks cover the question whether any plan should be suggested under which, subject to certain limitations, a municipality might be required to bear the cost of feeding its own poor. In ordinary times the municipality does feed its own poor; and in times of great distress, such as have recently affected the Punjab, the municipalities are bound—and Amritsar, Sialkot, and Rawalpindi have fully admitted the obligation within the last few months—to spend the whole of their surplus municipal revenues in the support, not only of permanent residents of the towns, but of strangers temporarily residing within their limits.

9. The Lieutenant Governor does not think that when a famine is over districts can be specially taxed to recoup Government for any extraordinary expenditure. In the first place, and supposing no change to be made in the imposition and incidence of the special taxation which has now been imposed, the money spent will not have been expended by Government at all, but will have been contributed by the people themselves for the very objects to which it has been devoted. But, even supposing that the proceeds of this special taxation have been exhausted; and that the Provincial Government is compelled to contribute to famine relief more than has been raised in the district, or that the Imperial Government has been compelled to grant more than has been raised by famine taxation in the Province, the Lieutenant Governor still does not think that, after the cessation of famine, any additional or special taxation should be imposed to recoup the Provincial or Imperial Government for the excess expenditure. Should the Supreme Government at any time determine, as it resolved and declared in the Madras famine, though unfortunately in vain, that, whatever the distress, no life should be lost by famine, and undertake measures which are far beyond the power and resources of local committees or the Provincial Government, it must itself provide the necessary funds, without hope of repayment. Nor, if the calculation of the amount required annually for famine insurance be correct, would it be necessary to ask to be recouped, as the surplus collections of one part of India would be set against the excess charges in another. To specially tax a district to recoup Government for exceptional expenditure is, in the opinion of the Lieutenant-Governor, the exact reverse of what the policy of Government should be. It would only have the effect of sinking the population further into debt, difficulty, and bankruptcy; each year they would be more impoverished, and more unable to meet the next scarcity, which would again increase their liabilities and burdens. It would, in his Honour's opinion, be far a wiser policy for the Government, after the occurrence of a famine, to remit in a particular district, rather than increase, the revenue demand, thus allowing the people to regain their elasticity and recover from their misfortunes.

BENGAL.

BENGAL.

Mr. Toynbee

Famine Finance.—None of the officers consulted have been able to propose any feasible scheme under which famine expenditure, provided in the first instance from State funds, should be recovered from the localities benefited in such a manner as to create a sense of local responsibility. If famines were due solely to causes under the control of those who suffer from them, there would probably be little difficulty in the matter. But to tax a particular district or particular tracts of country because the soil in them is drier, or because the rains of heaven are more frequently withheld from them than from other districts or tracts, is, on the face of it, unjust in the extreme. Over-population and improvident habits are certainly causes of the aggravation of the effects of a famine occasioned by drought, but they are hardly grounds for taxation or for legislative interference, unless indeed nature's laws are to be superseded and a system of State relief and poor laws substituted. The principle of such a system of local taxation would be to fix the burden on the shoulders of those least able to bear it, and it would tend to demoralise the people by making them look more than ever to Government for aid. If each district were a unit complete in itself and quite independent of other districts, the principle would not be so difficult of application. But in Bengal hardly any two districts, indeed hardly any two pergunnahs of any one district, are exactly similar in physical and economic conditions. Each would have to be treated on a separate principle to avoid inequality in incidence. The localities which benefit from famine expenditure are not solely those in which famine exists. The more fortunate and prosperous districts make a large profit by selling them their surplus stores. Why should they not bear their share of the famine taxation? Even granting that a district subject to famine should in theory be made to bear the expenses of that famine, how is the taxation, when imposed, to be realised? It is not the trader alone who is benefited; but is he to be the only person to pay? Landlords have to wait for their rents until better times come. Beyond the system of provincial taxation now in force in Bengal it seems impossible to go. In the road cess and public works cess the land already contributes its share of famine expenditure. The road cess funds are purely local in their application. When scarcity comes, work is given, at first, from them only. If scarcity ripens into famine, large works are opened under Public Works Departmental supervision. The former provide for those unable to do a full day's work; the latter for strong and professional coolies. The one class of work benefits the district in particular, the other the province at large as well. The profits of the trading classes are already tapped by the license tax. There would be no difficulty in setting aside a portion of any of these three funds for expenditure in the districts in which there was famine. But there is not a district officer in the province who would willingly incur the odium or responsibility of introducing anything beyond this in the way of direct taxation. It must never be forgotten that new modes of taxation are almost as disagreeable to the people as new taxes themselves. To modify a tax even is to unsettle the minds of the people, unless the modifica-

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BENGAL.

r. Toynbee.

tion be in the way of reduction. If, then, it be impracticable to make the district the unit of taxation-decentralisation, how much more so would it be to make the municipality? The municipalities in Bengal already pay quite as high taxes as they are able to bear without more than outward grumbling. In times of distress the poor flock to these towns, where the richest natives live, and are fed and maintained by them. The share they pay of the license tax is, of course, far greater than that paid by the rest of the district; and so they already bear their full share of the burden. It would be impossible to make a municipality provide for more than its own poor; but how would it be possible to prevent the usual influx of poor from the interior and from smaller towns? There is no doubt that there would be this further effect of any system of purely local famine taxation, that it would at once entirely dry up the springs of private charity. We must then come to a vast system of State relief founded on a comprehensive poor law. Where is the district officer, his hands already full enough of work and anxieties, who could contemplate such a prospect without a shudder? The sense of local responsibility, as far as he is concerned, is quite strong enough already; and no system of local taxation, such as that suggested, could ever affect a district officer's sense of his duty to save life and to prevent unnecessary expenditure. The individuality of no human being can be touched by a system of taxation, which cannot make him otherwise than he is. On the head of the district administration alone would it depend, in reality, whether the expenditure of funds, however raised, was lavish or parsimonious, or whether the golden mean was hit off.

All the officers consulted are generally agreed as to the general principles enunciated above, and there is no doubt that such a scheme as that indicated in the committee's 26th question would be received with disfavour and heartburning by governors and governed throughout the whole length and breadth of the land. It is hardly necessary to mention some of the alternative suggestions that have been made. One officer would resuscitate the old village communities and give landlords the power of compulsory labour, would tax tobacco, seals, ferries, and markets, and would have a committee on lands left for charitable purposes. Another would store grain on behalf of Government, tax stallions, and revive the income tax. Such proposals are hardly worth serious consideration, and are beyond the points mooted by the question.

Any attempt at further increasing the taxation of the country would be attended with the most mischievous results. The present taxes ought to provide ample means for carrying on the administration. The new license tax obtains a fair contribution from the classes who, as shown above, have reaped the greatest advantages from the influx of money into the country of late years. An income tax would tax the class least able to pay, the men with small fixed inelastic incomes—the very class which suffers most from rises in price and scarcity.

Mr. Beadon.

The subject has had my careful consideration, and I have taken every means in my power to consult native opinion on the various points which arise for consideration in paragraph 26, chapter I., of the Famine Commission's inquiries.

2. Feeling that the intelligent object of affording relief is to raise the person relieved to a position of independence in the future, I am sure this can only be attained by a well-regulated local system of charity. It has long been known that co-operation, co-operative schemes, and facilities for saving money are the best cures for poverty; but, except in the direction of the last mentioned, this country is not yet ripe for official interference and guidance so far as chronic poverty is concerned. No doubt, whatever phase of poverty has to be contended with, the chronic or the acute, what is wanted is not to diminish private charity, but to fit it to receive better organisation and to co-operate with the official systems of relief, instead of being, as at present, wasted in numberless spasmodic andill-directed efforts.

3. We should, however, have to work with threads which, for ordinary requirements, it would be impossible to weave at present into a harmonious whole with our few and over-worked officials and our want of general intelligent aid from without. At present, public opinion applauds the unsystematic and somewhat ostentatious charity which is daily indiscriminately bestowed on the deserving and undeserving poor alike. At present, relief to the hungry stomach is recognised as a duty; but no natives give thought to the incurable or painful disease, or the mis-shapen limb, of the indigent cripple. I would, therefore, dismiss at once the scheme hinted at in the questions before us for a poor law for municipalities.

4. The most we can do at present is to create an intelligent local responsibility as regards the distribution of relief in times of general distress and starvation. In ordinary times the natural liberality of the well-to-do as regards food is sufficient for the purpose of supporting those who are reduced to beggary, nor has the time yet come when even on occasions of general dearth the system could be introduced which, in England, throws the responsibility of managing for its own indigent and helpless upon each union or circle, and any attempt to introduce a system of that kind would infallibly end in jobbery and embezzlement or feuds and slander.

5. Still there is a medium between the extremely small areas in which efforts towards relief are localised at home and the practically unlimited region throughout which all measures are matured under high pressure at the time of a famine in this country.

6. The unit which I consider the country best fitted to adopt is the district.

7. In the first place the headquarters of the district, except in a few favoured subdivisions in the most advanced parts of the country, such as Serampore and Baraset, is the lowest point at which we can hope to secure any continuous public effort and non-official co-operation in raising and controlling funds for relief operations. There nearly the whole of the intelligence of the district, such as it is, collects, and communication, either public or private, with the outlying parts is constant.

8. Local responsibility may well be centred here; and if it be based upon and regulated by firm and independent lines, taxation imposed by a deliberative assembly in the district, and collected by the agency, and in the form that that assembly shall determine, would readily be submitted to, to an extent that would give rise to intense murmuring if carried out direct by the Government.

9. The disbursement of funds so collected might well be left to the control of the district assembly, subject to the same restrictions which Government might think it necessary to lay down regarding the constitution of the assembly to secure the performance of any broad lines of policy which it may have determined on. This assembly should of course contain a strong official element in it, besides being composed chiefly of native gentlemen selected on account of position, wealth, high character, or special intelligence, and taken from all classes and all parts.

10. I will now proceed to enter into some detail as to how the views sketched above might be carried out, and then to consider the form of taxation or other sources from which funds for relief may be raised in this district.

11. To meet the famine in India let the Government of India lay down the sum which it desires to reserve as a general famine assurance fund, say 10,000,000*l.*, or 10 crores of rupees. This should be partitioned out to the different local Governments and administrations, to be raised by taxation or otherwise according to the taxable means of each province and its liability to famine. The two con-

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Mr. Beadon

ditions are antagonistic, but they ought both to be considered. Say the contributions from Bengal, Behar, and Oritsa are to be two millions sterling, or two crores of rupees. It might in turn be considered proper that Cuttack, a medium district of Bengal, should contribute 4½ lakhs. This might be collected in nine years by a tax annually yielding about Rs. 50,000, *i.e.*, about as much as the present license tax. When any district has contributed the full share prescribed by Government, whatever that share may be, it should be relieved of all further taxation; in other words, after it has contributed its quota to the assurance of the whole, it should not be called on to give anything more unless the capital of the general assurance fund has to be increased, in which case a small increase to the district contribution must be made in common by each district throughout India.

12. A district relief assembly should be appointed, consisting of all the chief officials and 40 non-official members, somewhat as noted below* as regards the Cuttack district.

13. Directly the Government decides upon the portion to be contributed by the district, the assembly should be bound by legislation to prepare a scheme as to the method by which the money should be found. If the assembly be unanimous, or the question be carried by a majority consisting of ⅘ths of the whole number of members, the interference of Government should be unnecessary, and the tax might be imposed and levied by an executive order of the assembly. If there be any less majority, or even the unanimous consent of a meeting at which ⅘ths of the whole number of the assembly be not present, the report of the proposals of the assembly and the views of the majority and minority, if necessary, should be laid before Government for decision and orders.

14. When the district is first attacked by famine or there is probability of the same, the executive council of the assembly should have power upon its own responsibility to call upon Government for a moderate advance to meet immediate necessities, but the general assembly must be convened at once to determine what sum of money it should ask Government to place at its disposal for protective or relief measures; further sums from time to time being asked for in the same way, and any balance unexpended being cancelled or repaid to Government for return to the fund.

15. On the close of famine operations in a district, it should be determined by the assembly in what way the sum expended under its deliberations should be again raised, and, subject to the approval of Government, what period should be allowed to lapse previous to taxation in order to avoid any special severity attaching to its imposition. On the sum originally assessed being made full, taxation should cease.

16. The executive council of the assembly shall be composed of at least 10 members of the assembly selected by the assembly regardless whether they are officials or non-officials, but any member of the assembly shall have the right to be an additional executive member if he desires to be so. The whole of the actual distribution of relief shall be carried out by the Executive Council under the instructions conveyed at monthly meeting by the General Assembly.

17. As long as the General Assembly works unanimously, or as nearly so that ⅘ths are agreed, there should be no interference on the part of Government to any further extent than has been lately the practice in the case of relief administered from private subscriptions.

18. The assembly should have full power to appoint a salaried secretary, clerks, accountants, visitors, overseers, tax collectors, &c., as may be necessary from time to time, and all charges on account of the imposition and collection of the tax should be provided for by taxation over and above the proportional sum which has to be collected.

19. Government supervision should be exercised through quarterly reports when relief operations are in execution, but the whole management should be conducted by the assembly and its officers, and the accounts should be kept and audited in the district.

20. Any extra officers required in famine time should be supplied and paid by Government from the funds at its disposal from the interest of the accumulated capital; such officers Government would decide to send or to withhold on report from the Commissioner of the division.

21. In general terms, such should be the constitution of the fund and the assembly which should control and manage it. All such members should be public servants as defined by the Penal Code.

22. It would be easy for Government to exercise very great influence on the operations of the assembly through the influential officers who would form part of it, but it is essential that the working of the assembly should have the appearance of being promoted by free will.

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*In Cuttack**—

Officials.
- Commissioner of division.
- Judge of division.
- Collector.
- Superintending engineer.
- Civil surgeon.
- District superintendent.
- Executive engineers (two).
- Deputy collectors (two).
- Joint magistrate.
- Subdivisional officer.
- The Government pleader.

Fifteen land-owners taken from different parts of the district.
Ten makdoms or thain ryots.
Three pleaders other than Government pleader.
Five merchants, English or native.
Two money-lenders.
Two cloth-traders.
Three men specially fitted by training or intelligence.

Mr. Glazier

The question so called seems to divide itself into the following parts:—

(*a.*) Whether it is desirable that a portion of famine insurance taxation now levied should be kept in hand for local apportionment in case of need, instead of being paid wholly into the Government revenues.

(*b.*) Whether money spent in relief from State funds could be recovered from the locality in which the same had been spent.

(*c.*) What sense of local responsibility would be created when money thus accumulated in a local fund, or advanced from State funds, with a liability to be recouped from local taxation, was expended; and what effects it would have respectively on the minds of the people and of officials in the matter of securing life and ensuring economy in the administration.

(*d.*) To what extent should this local responsibility be carried, whether to a district, subdistrict, municipality, or any special class of people who had been relieved.

(*e.*) Whether any new taxation should be imposed in modification of that portion which would not be credited to Government revenue, but kept to be used locally.

I opine that I have rightly put in question (*a*) the suggestion of the Commission, where it proposes that a portion of taxation should be local in its levy and application. The famine taxation now levied in this district is public works cess and license tax. The former yields Rs. 75,000 a year, and the latter is expected to yield the same amount, making an annual total of Rs. 150,000. At present all this money goes into the State treasury. It is, I believe, proposed to spend it on public works, if not wanted for immediate famine purposes, and thereby relieve the Government of the necessity of borrowing to a certain extent; and

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in the event of famine, the Government will then be enabled to borrow to the extent that it has previously been saved from doing, and a famine fund will thus be in existence when wanted.

Under a scheme of local responsibility, we might lay down that half of this famine taxation only should be paid into Government revenue and half funded locally; and that, in the event of famine, the Government would bear half the cost of the local relief measures, and the other half would be paid for from the local funds. In this district there would thus be (half of Rs. 150,000) Rs. 75,000, raised yearly, to be locally funded. This could be invested in Government paper in the name of a strong body of local trustees.

In the event of no famine occurring for some time, and when the local fund had consequently attained respectable dimensions, that portion of the local taxation representing the local half could be reduced or remitted. Such a scheme would, I consider, be certainly desirable. Its effect I shall consider further on.

Question (*b.*)—If a famine occurred before the local fund was strong enough to support its half of the expenditure, the Government would have to advance what was required; and if the arrangements I have suggested above were adopted, that extra payment of Government could be recouped in future years from the receipts of the local funds, and, if necessary, special temporary taxation could be imposed for the purpose.

Question (*c.*)—The effects of this local arrangement *would be good. The people would see that a part of the money avowedly raised for famine purposes* was distinctly set aside for that purpose. At present all money is lost in the abyss of the Government Treasury, and no one can trace it afterwards. If, too, in the event of there being no famine, the local portion of the taxation was reduced or remitted when the fund had increased to a certain amount, the people's satisfaction would be mightily increased.

Even if, in the circumstances suggested in the answer to question (*b*) a debt was incurred to Government which had to be recouped, the taxation rendered necessary would be borne with less discontent when the debt had been incurred for a definite object than if taxation was imposed for general purposes only.

As regards the effect of this local responsibility on expenditure as far as officials are concerned, I do not think much difference would take place. As the Government would be half sharer, its control would be much the same as now. But I imagine the effect of this local funding system would be good in securing useful local effort, if the control of the local trustees was allowed to be effective. The tendency would be somewhat that of the poor law guardians in England—a tendency to economy and harshness. This, I think, would be useful to a certain extent, and the control of the Government officials would prevent such economy from being carried to a dangerous extent.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.

I do not think that it would be expedient to levy the cost of relief within the area of distress, at any rate not for four or five years after the occasion which had called for relief. Otherwise the recovery of the locality would be very greatly retarded, if not rendered impossible. I think the same objection would apply with even greater force as regards any particular classes, (the very poorest of all) of the community requiring relief. I am averse to "hitting a man when he is down."

I think the same objection applies to the making one province bear all its expenditure, at least to the rigorous enforcement of such a rule.

In good years the Central provinces do much towards supporting populations beyond our limits; for instance, Cuttack, the lower parts of the North-western provinces, Bundelkand, Malwa, and especially Berar and parts of the Bombay Presidency. These parts can never, when we are in difficulties, restore to us an equal quantity in grain for the money which we would repay. In times of distress at home we have had also the burden of supporting swarms of immigrants others than remunerative labourers from Cuttack, Berar, Central India, the North-western provinces, and above all, from the states of Bundelkand and Baghelkand. In case of future distress, I think we might fairly expect help from the adjacent British provinces, and, if there should be no obstacles of a political nature, from Berar also.

I think also that the efficiency of our own arrangements to meet the famine of 1868–69 was unfairly taken advantage of by, at least, some of the adjacent native states.

At the same time, I think that no hard and fast rules should be laid down on this subject; that, on the contrary, the Supreme Government should, on the merits of each occasion, as it may arise, apportion the shares of the expenditure which may be held to have been absolutely requisite to the neighbouring provinces which may equitably be deemed liable. In doing this, it would no doubt be recognised that in the same way that one district officer differs from another in his estimate of what is distress calling for relief at the expense of the State, of what is famine, and of what is absolutely expenditure, so will local administrations differ.

I do not think that it would be at all expedient to attempt to make the municipality bear the cost of feeding its own poor; townspeople are always ready, according to their utmost ability, to afford relief, first of all by private charity, and, in case the numbers of applicants become too great or unmanageable, by organised efforts, when supported by the countenance of the district officers. They make no distinction between the sufferers, whether fellow townspeople or outsiders.

Where there are municipal committees, these liberally afford employment and supply the machinery for organised charitable relief. State relief is scarcely asked for by townspeople, unless they are swamped by villagers crowding in.

I am of opinion that, if municipalities had to look forward to after-taxation, their charitable efforts would be grievously restricted, and that much ill-feeling might result from the drawing of a distinction between sufferers who happened to live in the town and those who live in the surrounding country, and who contribute to the octroi which forms the municipal income.

The knowledge that the cost of famine relief expended on their behalf would have to be recouped by local taxation would, I think, at the times when famine is not imminent, fail to induce any extra industry or providence. In a time of famine, I am inclined to think that on the people it would have a bad effect. At the present the "Sirkar," sometimes still spoken of as the "Company Bahadur," is a distant, vast, and vague, but beneficent power that must not be provoked. They hope that if they themselves are well-behaved, the local representatives of the Government can obtain money from the "Sirkar" to save them. And hitherto they have been wonderfully well-behaved, and have never claimed, as a right, to receive State relief. But if

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the people knew that it was not the funds of the State which would be disbursed by the district officers, but only money advanced from the Treasury to be recouped by subsequent local taxation, in a way their own money, I believe that the result would be first that private charity would dwindle, if not stop, that employment on costly tanks and works of permanent utility would, if carried on at all, be only undertaken on purely commercial considerations, that more especially the landholders, but in general all the bettermost orders of the people, would be placed in direct antagonism to those who require or look for relief, and would, while giving no relief themselves, oppose the giving of relief by Government officers, the cost of which would have to be repaid by themselves under some obnoxious form of taxation. On the other hand, among those who would not be, in their own persons, liable to direct taxation, I believe every man would be tempted to strive and scramble to get as much as he could at the common expense, and would cherish feelings of resentment towards those among his own people who would venture to oppose his clamour and importunity.

In parts of these provinces like Chhattisgarh, where the people are eminently migratory, there would be manifold greater danger, for there the lower people would get all they could from our relief so long as the famine lasted, and when the cost came to be levied, they would cross the borders into the feudatory states and into our zemindaris, and laugh at our schemes of subsequent and strictly local taxation, while the tax crushed those whose previous efforts and frugality had given them interests in the land, interests which would now chain them to their homes, and would not allow them, like the improvident ones, quietly to remove themselves beyond the jurisdiction of the tax collector.

As for the temper of the officials, I think that in the hopeless task of arriving at the truth amid the conflict of interests and misstatements, of keeping order between the opposing claimants, the one for economy, the other for lavish expenditure of the money of their betters, and being in want of the insight now afforded into the condition of the lower strata of society by the flow of charity and the result of individual efforts to give employment on works of "dharm"—they would be very unwilling to take decided steps in good time, and that eventually those whom it might be intended to benefit would be the greatest sufferers. It must not be forgotten that only those who would have to bear the after-taxation, and therefore who would be likely to oppose relief measures, could possibly make their opinions publicly known through the press. And, again, it is only by their agency that relief measures could possibly be carried out, unless we fill the country with borrowed Government officers, who could do but little good if the leading people of the rural tracts were opposed to their efforts. I think it will be an unfortunate day when the idle or improvident villager can demand as a right support at the hands of a Government officer, to be afterwards paid for by the industrious and provident inhabitants of his own village. Yet the same people, under present circumstances, though paying to some mysterious assurance fund, would be quite ready and willing to help their idle, improvident, or unfortunate fellow villagers so far as they can, if they be allowed to do it in their own way.

Mr. Neill.

It is asked what would be the effect on the minds of the people, and on the temper of officials, of the knowledge that famine relief would have to be repaid by local taxation. On the people I believe the effect (at the time when the famine is on them) would be nil. Who are those who have chiefly to be relieved? The poorest. They take no thought for the morrow; they pay no taxes (that they know of, the effect of indirect taxes and state monopolies being hidden from them); they have nothing to fear from fresh taxation, even if they thought of the matter at all. On the better classes the effect would not be greater. They would no more than the others realise that they would have to pay for the expenditure that was being incurred—they still believe the Government purse to be inexhaustible, and they cannot even now always understand why the Government is so grudging in its general expenditure. In famine times the better class of natives are liberal; they would expect the Government to be so also, and they would not count the cost, even if they could count it, and I doubt if they could even form an estimate of the rate of expenditure being incurred, and the pressure of taxation which they would subsequently have to submit to.

Neither do I think that the effect on the temper of the officials would be great. They are not permanently attached to localities. They are moved from place to place as the exigencies of the Government service demand. It is not by any means sure that they would have to raise the additional taxation which the famine expenditure involved; even if they had to do so, it would not necessarily be a concern to them. It seems to me they can have no motive in knowingly spending more money than is necessary; and if they are mistaken in their views as to the amount of relief necessary, the knowledge that the expenditure will have to be provided for by local taxation would not give them a truer insight into matters. An honest official would do what he considered necessary, regardless of consequences. I am inclined to think that lavish expenditure is not more to be feared than niggardliness; that officials are, as a rule, careful of the Government money; and that, generally speaking, they would look for and try to obtain the approbation of the Government by doing what appears much at a small cost. Officials generally take their clue from the Government which they serve, and it depends very much on the nature and tone of the instructions issued by the Government whether a famine is encountered in a calm and sober, or in a flustered and extravagant, manner. This being the case, I admit that in the interests of the Imperial exchequer it may be desirable that a province which has suffered from famine should meet from its own resources a portion of what has been expended on famine relief, and should not draw on the "mutual assurance fund" and the Imperial treasury for the whole. What proportion of the whole expenditure should be thus made good would, I think, have to be settled by the Government of India in each case as it arose, and would depend on the severity of the famine, the condition of the province, the extent to which it had permanently benefited by the famine works, and its contribution to the mutual assurance fund; and the way in which the repayment would be made would be by the Government of India demanding from the Local Government a larger contribution on account of the sources of revenue and departments made over to it, than it now receives. This larger contribution would be paid for so many years, until thereby the provincial contribution to the famine expenditure had been made up. The Local Government would then have the choice of reducing its expenditure on administration—of proceeding more slowly with public works, or of resorting to fresh taxation. In this manner provincial responsibility would, I think, be sufficiently enforced without the general principle of mutual assurance being departed from, and without the difficulties noticed as attending an attempt to localise taxation on account of famine relief being encountered.

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CENTRAL PROVINCES.

Mr. Neill.

With regard to a municipality bearing the cost of feeding its own poor, I think municipalities would generally do in that way all that could fairly be required of them. Experience has shown that in times of scarcity or famine the poor from the rural districts make their way to the towns, where they beg for relief; and in the towns not only are large numbers fed daily by private charity, but municipalities also organise relief houses. I do not think it would serve any good purpose were the duties of municipalities more strictly defined. I think there can be no doubt that they would always co-operate with Government in times of famine, and that no compulsion is necessary.

Mr. Grant.

It is a more open question whether the famine fund might not be applied so as "to bring into operation a sense of local responsibility;" but it would be perhaps difficult so to direct this sense as to combine the objects "of securing the lives of the people, and of "protecting them from unnecessary expenditure on "relief." These are almost opposite ends; and the same incentive would not work towards both of them. People spending what they knew to be their own money would, of course, be more careful of it than if they were dealing with funds coming from an unknown, and to them apparently an inexhaustible, source; but I cannot see how the sense of local responsibility, developed by localising taxation and expenditure, could possibly have the effect of stimulating the humanity and generosity of the taxpayers. Of course, if to this increase of localisation be superadded direct local responsibility for life, relief committees would be induced, both by their own respect for authority and by the pressure of the executive, to interest themselves in combating starvation; but both the incentive and the line of action would be different from those of operating in the cause of economy.

Admitting, however, that authoritative pressure might be relied upon to counteract the economical promptings of self-interest, it would be a clear gain to enlist the natural impulses of taxpayers on the side of economy. One fault of the present system of applying famine taxation is that it is over the heads of ordinary tax-payers; they cannot see, and perhaps might fail to see even if it were explained to them, how they are to gain in times of distress by the fresh imposts. To them the famine taxes must appear very much in the light of mere additions to existing taxation, and must thus fail to carry with them their proper recommendation; forming part, too, of the Imperial income, they may create a tempting, if delusive, show of surplus assets, and thus may prove a source of embarrassment to the Government. I think much stress should be laid on the first of these objections, looking to the admitted difficulties and risks, in this country, of fresh taxation and the consequent desirability, if not necessity, of carrying the people as much as possible with us in all such measures. To this end the establishment of local famine funds, visibly built up from the proceeds of the special taxation, and applied in the times of famine by members of the local tax-paying body would be serviceable, as bringing the scope and working of the new measures within the experience of all.

Of course, if these funds are to be created in order to develop a sense of local responsibility, and to satisfy the people of the good faith of the Government in its fresh taxation, they must be strictly localised, and they must be so employed as to be readily available in case of need. There would be no difficulty, with our existing organisation, in adding to existing local funds a fresh department for famine purposes, and in controlling its management, in a sufficiently representative manner, by means of some modification of the present local Committees. It might not be quite so simple to find suitable employment for famine funds. In some few cases they might perhaps be devoted to remunerative public works such, for instance, as a town water scheme, guaranteed on municipal revenues. A more appropriate way of using them would be in loans to clear off encumbrances on estates placed under the management of the collector by embarrassed landholders. Money is often wanted for this purpose, and is never procurable under 6 per cent., rarely at so low a rate. The security being excellent, famine funds might be lent out to these estates at 5 per cent., subject to withdrawal in case of famine, which it would always be possible to foresee soon enough in advance to admit of the funds withdrawn being replaced by loans taken on ordinary terms in the open market. The encumbered estates would thus gain by enjoying loans for a time, at any rate, on reduced interest; whilst the famine fund would be always capable of mobilisation with sufficient promptitude. Such projects as these, however, obviously require to be weighed and tested by local experience before they can be entertained; and I merely throw them out as suggestions for discussion should it be determined to localise famine funds, and to seek some means of employing them profitably. It must not be forgotten that, however great may be the advantages of throwing light on the objects of the special taxation, and of awaking a sense of local responsibility, by providing local insurance funds against famine, yet that any scheme of the kind must infallibly end by substituting State aid for self-help, and thus in laying the foundations of a terrible incubus on the country.* It may be that, as manufactures develop and communications increase, the poorer classes will be more and more cut off from the supports which they now find in the peculiar fabric of Indian society, and that a poor law will be forced upon us. But that time certainly does not seem to have yet arrived; and, so far as I know, the relief of the poor may still be treated as an exceptional emergency. I should much regret to see it take a visible place in the ordinary administration of the country; and for this reason it may, on the whole, be best to devote the proceeds of famine taxation to the reduction of debt,—not, as at present, indirectly, by allotments to reproductive public works, but separately and specifically, so as to interpose no complications of account between the objects of the Government and the more ignorant of its tax-paying critics.

To the minor questions in this group I have very little to add to Mr. Nicholls' replies. I see no reason why the principle of local administration, if adopted, should not be applied to tahsil subdivisions as well as to districts. At present there is a single local committee for each district; but I am aware of nothing to prevent the constitution of similar committees at the headquarters of each tahsil. They would aid the tahsildar as consultative bodies, and sometimes in executive duties. In this part of India, at any rate, the office of "panch," or committee man, is quite familiar to the people, and is not unappreciated by them. Every town has its municipal committee, and most large villages find members enough for a local school-board. The position of "tahil panch" would be more honourable and more sought after than a seat in less important committees; and, if circumstances even required it, then sub divisional "panchayats" might pave the way for some modified form of representation. They would in the meantime, to some extent, strengthen the hands of the executive in any attempt to deal with the relief of the poor by local organisation.

Municipalities cannot, I think, be charged with the cost of relieving all applicants coming within their

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* On this point I need not say much, as I have already written at length on the subject; and my views, if worth having, may be found in the 1877 volume of the "Nineteenth Century."

Central Provinces.

Mr. Grant.

limits until similar measures be extended through the length and breadth of the country. Even now, every town is, in times of famine, a focus for the collection of distress; and if the present occasionally intermittent efforts of private charity were to be replaced by an organised drain on the pockets of the townspeople, far more than their legitimate share of poor relief would be thrown upon them.

BOMBAY.

Bombay.

Colonel Anderson.—Instead of waiting entirely till famine came on, it would be preferable to anticipate it by reserving annually a certain small portion or percentage of local or provincial funds to meet at any rate the first calls of a famine year, and further, for the future realisations of the famine reserve fund to be liable up to a certain number of years' accumulations to repay the debt to the Imperial Exchequer. This would have some effect in enforcing and bringing home the sense of local responsibility for famine expenditure. I do not think that any plan for compelling a municipality to support its own poor would work; there would be extreme difficulty in discriminating between its own poor and immigrant poor.

The probable effect of a knowledge that a part of the famine expenditure would be recovered from the country by future taxation, first, on the people, would be to dry up all private charity; secondly, on the officials, it might tend to economy; but in consequence of the check to private charity, the expenditure of a larger sum on public relief would be rendered more absolutely necessary than would otherwise be the case. In every point of view, therefore, it would appear that the forestalling famine by the establishment of a reserve fund is more expedient than attempting to meet it in the main by additional and special taxation at the time or soon after.

Mr. Spry, Kaladgi.—The municipalities in this district have during the last famine borne their full share in affording relief by expending their cash balances, and even by raising loans, for the purpose. This has been done voluntarily, and probably the same has been done in other districts, and would be again. Therefore I do not see any cause for making such a burden compulsory.

The probable effects of special local taxation, and of making people think that they would be responsible for local relief, would be at once to shut up all private charity, and much more harm than good would be done; and I doubt whether it would be any check upon officials. I do not think that the public mind is sufficiently advanced to appreciate local responsibility, at least in this out of-the-way part of the country.

Mr. Ramsay, Kaladgi.—I am not prepared to recommend any scheme such as that here adverted to. It would be like an introduction of a form at least of the English poor law into India, and would be most obnoxious. The idea of municipal taxation for the support of the poor would be most repugnant to the feelings of the people. Charity is a virtue highly prized and practised in India, and taxation as above would tend to break down this feeling. The people should no doubt support their own poor, and this they do in their own way. Government interference would destroy the very springs of all private charity, and produce much more evil than now exists. In times of distress private individuals and committees have always been found ready and willing to act and to contribute, and it would be a fatal error to do anything to check this most creditable tendency on the part of the people. Government interference should be restricted as far as possible to guiding and assisting, if necessary, private efforts for the support of those unable to do anything for themselves, while its main action should be in the way of providing work for those fit and able to do it. Local and partial taxation is most obnoxious, and should, I think, as far as possible, be avoided. It is the partial nature of the recent license tax that has called forth such a very general feeling of opposition to it.

Mr. Norman, Poona.—From the purport of this question, I presume Government hope to devise some scheme under which districts or subdivisions of districts can be made to reimburse the State for famine expenditure. I do not consider this possible. The famine was most intense in that part of the district which is most impoverished, where, owing to the scanty and precarious rainfall, a good harvest is the exception. To a great extent this must be the case everywhere. The poorer districts owe their poverty either to inferior soil or to unfavourable climatic conditions. The cultivators have little opportunity of accumulating capital, and at once feel the effect of a bad season. The land is already assessed as high as it can bear and the existing settlements render it impossible to increase the land assessment even if it were possible to do so. It is true that until the imposition of the license tax the trading and artisan class had, for some years past, escaped all direct taxation; but in the poorer talukas these classes are not very numerous, and it would be impossible to compel them unassisted to bear the cost of a famine. For these reasons I consider it would be impracticable to make local communities responsible for the expenses of a famine. I do not think that any attempt should be made to apply this principle to any less area than a province; and in Bombay, I think, the Presidency limits should be accepted as the area within which an attempt might be made to insist on the people bearing the expenses of any local famine.

As to the manner in which funds should be raised for this object, I can suggest nothing better than an income tax. This is not the place to discuss the financial measures of Government, but I cannot help expressing an opinion that the present license tax will prove most unpopular with the mass of the population, and that it will yield a minimum revenue with a maximum of annoyance to the poorer classes of traders and artisans. A moderate income tax, which did not touch the lower class of incomes, would yield a much larger sum, and would be collected with much less difficulty. It would be for the financial advisers of Government to decide how this fund should be expended, and on this point it is very difficult to offer an opinion, but the greater portion should be invested in the public loans. Irrigation works, when the sources of supply are undoubted, are a great preventive of famine, but in this part of the country it is doubtful if any new schemes of this nature can be discovered. Irrigation from tanks must depend upon the rainfall, and when that fails the works become useless. No new roads are required in this district, the means of communication being ample, as was proved last year; and though many of those which have been commenced are still unfinished, the completion of them may be left to the local fund committees without aid from Government.

With regard to the liability of a town or municipality to support its own poor, I think this is a principle which might be carried to a greater extent than has hitherto been the case. In prosperous times all village communities support their own poor who live by begging, and the same is the case in towns. The people thus supported are those who are incapable of doing any work, such as lepers, cripples,

&c., a list of whom could, without difficulty, be prepared. I think the village communities might be compelled to support this class, the expenditure being in the first instance advanced by the State, to be recovered eventually by a house assessment. The relief thus afforded should be managed by the village officers or by the municipal committees, under general instructions from their superiors.

Mr. Charles, Dharwar.—The principle here mentioned seems to me exceedingly difficult of application. A very large proportion of the persons supported on relief works in the Dharwar collectorate belonged, not to the district, but to Bellary, Maisur, Raichor, Kaladgi, and the several native states, Sirhatti, Ramdrug, Kundgol, &c. It would be very unjust to the people of the Dharwar district to make them pay for the support of people who do not belong to the district at all, and, on the other hand, it would be next to impossible to either restrict the relief to Dharwar people or make an accurate estimate of the proportion of outsiders on the works, the latter varying from week to week.

The expenditure in a single subdivision should certainly not be recovered from it, as it would constantly happen (as in the case of the Kalghatgi taluka) that large and expensive works were carried on in it, not because the people of the taluka required help, but because it was a convenient and healthy place to concentrate the famine labour.

On the other hand, some of the talukas which suffered most had hardly any famine works in them, the famine labourers being sent elsewhere, partly in order to apply the distance test, partly because there was no work available in the taluka. My own feeling is against this principle entirely. No municipality could stand the expense of feeding the famine-stricken who flock into it, and it would be impossible to tell how much of the expenditure was on account of outsiders.

Mr. Percival, Sholapur.—In a district the whole of which has suffered from famine the local funds fall off and get into debt, the municipalities exhaust their balances, the cultivators lose half their cattle and most of their savings, and there is the Government revenue in arrears to be paid. If a famine covers a whole province or presidency, that province is similarly affected. To add to the arrears of revenue, a very large sum for famine expenditure would crush the district or province; it would be impossible to collect it all. There are two classes of persons to be provided for during a famine—(1) the labourers and poor cultivators who can work, and (2) the sick and feeble who cannot. It is the duty of Government, as the owner of the land, to arrange for the first either by providing them with work in their own district or elsewhere, or by encouraging and assisting them to go where they can find it. Government can turn their work to the advantage of the country, and see that a fair return is obtained for the money spent. On the other hand, the people of India are in the habit of supporting their sick and infirm; they willingly give labour, money, and grain for the purpose, and they can do it cheaply and effectually. If Government try to do it they are cheated in all directions, the tests they are obliged to enforce are hateful to many and drive them away, and the system is costly and ineffectual. It should be left to the district to provide for the incapable. The knowledge that if they failed Government might interfere and collect the cost from them afterwards would act as a stimulus, if any was wanted. Distressed persons from other districts would be kept out, and each town and large village would be forced to look after its own poor, while taluka and district committees would watch the rest of the villages and collect funds from far and near for systematic distribution. As a matter of fact, during the famine three-fourths of the charitable relief was from private sources, but it was not so systematised as it should have been.

Mr. Erskine.—I view with extreme distrust any proposals of the nature of those made in this paragraph by which it might be rendered practicable to provide that, where State funds have been expended on the relief of famine, such expenditure should be recovered from the locality which has benefited by it. It seems to me that, in case of famine, funds expended to meet the necessary charges should not be repaid by any single district. If a district has suffered from famine, it is presumably in a worse condition to repay any part of the cost than other parts of the Empire; and any attempt to make it bear such charges would, in my humble opinion, be not only unjust, but impolitic. To begin with—the expenditure incurred is so incurred without consulting the population of the district; they have no voice in the matter, neither do they exercise any control over the expenditure. Such expenditure seems to me essentially in its nature an Imperial charge incurred for the well-being of the State. It would be as just to assert that, if an expedition was fitted out to punish frontier tribes who had been plundering frontier districts, the whole cost of such military expedition should be borne by the frontier districts concerned, as they "benefit by it," or that the whole cost of an expedition to suppress pirates should be borne by the merchants whose trade was affected by the acts of piracy, as they benefit by it. Yet I have never heard such an idea broached. The suppression of a famine is quite as much an Imperial matter as the punishment of frontier tribes or the extirpation of pirates, and the cost should equally come out of general revenues.

Private charity steps in to supplement public expenditure, and to the credit of the natives of the country be it said that they have always come forward liberally to aid the distressed; but were any endeavour made to tax localities in consequence of famine, the springs of private charity would inevitably dry up, and much unnecessary odium would be incurred by Government in raising by taxation those sums that are now voluntarily paid.

In like manner, I do not think a municipality in times of famine should be compelled to bear the cost of feeding its own poor. Scarcely any municipality has sufficient funds to do this, and extra taxation would therefore be necessary at a time when, owing to increased expenses of living, such increase would be unusually unpopular, and would be looked on as a great hardship. Were any attempt made to compel municipalities to feed their own poor, they would be sure to refuse to feed non-residents, and these, who form in many cases the larger number of applicants for relief, would still have to be provided for from State funds. Were such a system in force, it would lead, I fear, to those who require relief being sent frequently from one relief-establishment to another, and would give rise to confusion and complaints. Not having had any experience in a district where real famine prevailed, I am unable to say whether the sense of local responsibility could be brought to bear, but I am inclined to think it could not be so with any real advantage.

It appears to me that the system of local responsibility for the relief of famine sketched in this question amounts in principle to nothing more or less than a poor law. In my humble opinion, the introduction of a poor law in India would be the most fatal error we could commit, and would be equally ruinous to the finances of the empire and to the character of the people. At present, every family, every locality, every community, is by custom responsible for the care of its own helpless or destitute; and the readiness and thoroughness with which the responsibility is accepted is one of the best traits in Hindu character. When, in the case of famine, the people cease to take care of their own poor, it is simply because they are no longer able to do so; and I fail to see how any enforced system of local responsibility will restore to them the power they have lost.

Mr. Pedder.—We—being apt to adopt any phrase that happens to be current in England—usually think

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that the native habit of almsgiving demoralises the people. I very much doubt it here. The people know each other's circumstances very well; and a family will not maintain a member who could work for himself, nor neighbourhood a person whose own family are able to maintain him. With the single exception of religious mendicants (and their case could not be touched by a poor law), I believe that all the people who live on the charity of the public are really destitute, who would otherwise have to die, or under a poor law to be supported by the public, no matter what tests might be applied.

But once we declare the principle of local responsibility for relief,—that is, as the people will understand it, that Government are going to take care of the poor,—we shall find in a few years that the people will decline to take care of their own poor. "Why," they will argue, "should I maintain my own halt and "blind, and also pay taxes to maintain other people's?" Then the charge on local revenues will be ruinous; the people will be demoralised, because Government agency can never distinguish real destitutes as the people now do themselves; and from imperfection of agency, and from the desire of avoiding indiscriminate relief of the undeserving, the really destitute will not be half as effectually supported as at present, and there will be constant scandals and complaints of a cruel Government which allows the poor to starve.

But even supposing that this local responsibility can be restricted solely to the case of actual famine, the result of the principle, it seems to me, is simply to throw the burden on those localities which are least able to bear it, and thus to check the natural recovery, when better times come, of a famine-stricken tract.

As for the effect on the temper of the officials of the principle of local responsibility, I should imagine that a worldly-wise official would try to prevent deaths from famine, no matter at what cost; and, on the strength of his success, would endeavour to get promoted somewhere else before the *mauvais quart d'heure* of payment arrived.

In fact, it seems to me that the old rule is safest—that, when one member suffers, all the members shall suffer with it. I must say I do not believe in nostrums like this of local responsibility against famine. We had best, it seems to me, stick to the straightforward plan; admit that there will from time to time be heavy charges on account of famine relief; economise the resources of the Empire, so as to be able to meet these occasional extra demands; not start a famine till we are sure that the distress is such as cannot be met by the ordinary resources of the people; then meet the local calamity with the power of the country generally; and get what set-off we can against the misfortune by utilising the labour-test to provide those public works which, from not being directly remunerative, cannot be afforded under ordinary circumstances.

MADRAS.

MADRAS.

Sir W. Robinson.

I do not myself appreciate the principle of a mutual assurance fund as applied to the financial exigencies of a tropical famine; the principle of a local poor rate seems to me more in keeping with precedent and circumstances. The moral obligation that a population must not be permitted to let its poor starve to death under any circumstances holds good in India, as it does elsewhere It is, of course, more difficult of administration here, from the spasmodic and large proportions of the occasional demand for poor law aid; but it is not on the whole an impossible matter to meet it with some moderate success, either as respects the administration of relief or adjustment of the consequent poor rate burden. This is, as it appears to me, a matter of distribution. The poor in India get on fairly well under ordinary circumstances without taxational aid, and we do not need a regular poor rate as yet. But a famine comes, and the accumulated obligation appears at once in a very aggravated form, and the additional burdens cannot be borne by the people while the calamity is running its course. The question seems to me to be:—How best to arrange for the recovery of the necessary expenditure. The collection of a practical poor rate by taxation in advance does not commend itself to my judgment; and always must, I think, be (as in the case of the license tax) received with feelings of distrust by the people. I confess that I cannot devise a more practical solution of the financial matter than to advise that the fisc advance the needful poor rate from the public purse as a local loan, to be recouped with interest as the country recovers after the disaster has passed. I have stated my views on this point somewhat more fully in my answer to Mr. Ballard's questions. The mutual poor rate should be provincial, and of course the necessity of repayment would have the usual effect on the minds of the people and of the Executive; and, what is equally important, I think that there would be less anxiety on the part of the fisc than has ruled of late. Do what we may, famine rescue must be costly and long-protracted.

REPORT OF THE INDIAN FAMINE COMMISSION.

APPENDIX.

VOL. IV.—EVIDENCE IN REPLY TO INQUIRIES OF THE COMMISSION—(*continued*).

Chapter II.—Relief during Earliest Stages of Distress.

Chapter III.—Famine Relief.

Chapter IV.—Famine Prevention.—Preparation of Schemes of Work for Future Use.

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APPENDIX.

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CHAPTER II.

RELIEF DURING EARLIEST STAGES OF DISTRESS.

1. Indications of Approaching Drought.

How does distress consequent on drought first make itself felt among the people, and how is it first brought to the notice of the district officers? What are the indications by which the district officer would judge whether the distress is due to temporary or local scarcity, or is likely to be the forerunner of very severe general distress ending in famine? What steps should be taken to ensure that such indications are brought to his notice? To what extent does the existing district organization suffice to ensure early and trustworthy reports, and if not sufficient, what other measures are suggested as requisite? - - page 1.

2. Classes of Rural Population first Affected.

Which classes of the rural population are first affected by serious failure of crops likely to produce famine? In what way are they affected, and how is the effect manifested? Do the early applicants for relief consist of whole families or of isolated individuals? Are all sexes and ages equally represented, or do women and children preponderate among them? So far as the applicants are field labourers deprived of employment, does this arise because the employers have no money or grain to spend on wages, or because there is nothing to do in the field? - - - - - - - - - - page 10.

3. Classes of Urban Population first Affected.

What classes of the urban population are the first to feel the effects of famine, and in what way do those effects operate on them, and how do they manifest themselves? How may they best be watched and met in their first stage? - - - - - - - - - - - page 19.

4. Proportion of Population Supported by Private Charity.

There is a considerable number of poor and infirm persons who in ordinary years are supported by their richer relations and friends or caste fellows, and of habitual mendicants, but who become claimants of State relief when scarcity or famine arises. What is approximately the proportion of this class to the total population, and at what stage do the springs of private charity begin to dry up? - - - page 22.

5. Forecast of Condition and Requirements of District.

It is obvious that if an accurate forecast of the condition of the people during the approaching season, following any more or less serious failure of the ordinary harvest, could be made by the district officer, it would be of great utility; in what way could he make it, and on what data should his calculations be based? Suppose, for instance, that he estimates that half the average food crop has been lost; for the support of how many people does the balance that is saved suffice? How are the rest of the people to be fed? He must form an estimate of the food stocks in the country and of the power of trade to bring in more. Supposing these two elements sufficient to supply what is wanted there would be no famine of food. But there may be lack of money to purchase food; how is an estimate to be framed of the number of persons who would probably be able to purchase, and of the number who [illegible] assisted by the State, either by employment which will bring them wages, or by food if they [illegible]? These would consist mainly of the classes indicated in questions 2, 3, 4, viz., the field labourers, [illegible] poor, and infirm dependants or mendicants. What numbers approximately of these classes would you expect to have on your hands if the food crops in your district failed to the extent of ⅓, ½, or ¾? and if this happened in two consecutive years? - page 25.

6. Measures to be Adopted to meet Temporary Distress.

What measures should the district officer adopt for relief supposing that he believes the distress to be temporary, or is not satisfied that it is indicative of approaching famine? Should applicants be first employed as far as practicable on the ordinary works in progress, whether under provincial or local officers, or under agents of the Public Works Department or municipalities? Under what tests should applicants be admitted? Under what circumstances may it be desirable to open special works? How should such special works be arranged? Whether so as to collect the applicants in comparatively large numbers at a few localities, or to give them employment in smaller bodies at many places in the distressed region and in the vicinity of their homes? May such works be best placed under the Public Works Department or under civil supervision? State the arguments in favour of and against either course. How may the Public Works officers be best placed in communication with the district officers for these purposes? How should the Public Works officers be guided in their selection of works for relief? And on whom should the responsibility rest in the district for seeing that all needful steps are taken by all branches of the public service concerned?
page 41.

7. Poor-house Relief without Labour Test.

Under what circumstances should poor-houses be opened to give relief without a labour test? Are there any other practical ways of affording relief at this stage except through private charity? - - page 62.

8. Field for Private Charity at Early Stage of Distress.

Is there at this stage of the operations any field specially appropriate for the intervention of private charity? If so, what is that field, and how should the charity be organized and directed? - page 67.

9. LOCAL COMMITTEES AND NON-OFFICIAL CO-OPERATION.

To what extent and in what manner may the organization of municipalities and local fund committees, so far as they exist, be utilized in this stage? In the absence of such local bodies how could the co-operation of influential non-official persons be best organized and utilized either in connexion with the regular district authorities, or otherwise? State specifically what plan would be suitable in your district? - - page 70.

10. VILLAGE INSPECTION.

Have cases occurred in which such measures as those referred to in paragraph 31 *of chapter III., regarding village inspection, could properly be introduced during this, the earliest stage of distress?* page 77.

11. LOCAL CHARITIES FOR DISTRIBUTING FOOD.

What local charities exist in your district for distributing food to the people? Are they appropriated to any particular class, or are they available in times of distress for feeding people of all classes? What is their annual value, and how many people are benefitted by them? How are they managed? Could they be made more effectual for charitable purposes in times of famine? - - - - - page 80.

12. INDICATIONS OF DISTRESS HAVING BEEN UNDERRATED.

It is assumed in question 6 *that the district officer believes the distress to be temporary, or is not satisfied that it is indicative of approaching famine. But it is possible that he may be mistaken in his appreciation of the facts he at first observed. What indications would lead him to conclude that he had been mistaken and that famine is imminent? What steps should he take to have any such indications brought to his notice? The most obvious points would be such as these: to obtain the best information as to the character and progress of the crops on the ground; as to the prices and the kind of grain exposed for sale in the markets; as to the fullness of stocks in the market, and the quarter whence they come; as to police returns of lawlessness and crime; mortuary returns of deaths; reports of deaths by starvation in villages, and more especially roadside deaths; emigration or movements of the people in any direction; sales of ornaments and jewels. Are there any other such indications, and in what way should he secure that such facts should be immediately brought to his notice?* - - - - - - - - - page 83.

13. INDICATIONS OF DISTRESS HAVING BEEN OVERRATED.

On the other hand, the distress which the district officer has held to be serious, though temporary, may turn out to be so slight as to require no special measures of relief. What are the indications which would lead to the conclusion that this is the case, and what steps should he take when he comes to that conclusion? Are any precautions requisite to guard against an erroneous estimate of the necessity for offering relief other than those which are supplied by the application of suitable labour or other tests? - - - page 87.

CHAPTER III.

FAMINE RELIEF.

N.B.—*In answering this and all other questions in this chapter, remember to draw the distinction (where necessary) between the three periods of famine—its beginning, height, and decline—and also between P. W. D. and civil relief-works.*

It may be assumed that the State is responsible for offering the means of support to all persons not able to provide for their own maintenance during time of famine, subject to the imposition of such tests as will prevent relief being given to persons not really in want, and will protect the public finances as far as is practicable. The methods of affording direct famine relief to persons in want in time of famine hitherto adopted by Government are—

(1.) *Relief given subject to a labour test or in return for labour.*
(2.) *Gratuitous relief not subject to any labour test.*

Relief work may be divided into that which involves—

(1.) *Unskilled labour, commonly earth-work.*
(2.) *Skilled labour for artizans.*

Gratuitous relief may be divided into—

(1.) *Relief given at poor-houses.*
(2.) *Relief at home.*

SECTION 1.

2. Public Works Department and Civil Agency Works.

The first division of relief-works for unskilled labourers may be into works supervised by officers of the Public Works Department and works supervised by the civil officers; the former will generally be works of greater permanent utility, requiring more skilled supervision, and taking a longer time to complete; the latter will usually be less important, less generally useful, and simpler in character. State what are the circumstances under which either class of work is preferable. Referring to the considerations mentioned in paragraph 7 of the Resolution of the 16th May 1878, quoted in the margin, state also if you consider that there is any class of labourers to whom the one kind of work is more suitable than the other, and what are your reasons for this division? - - - - - - - - - - - page 90.

“ Officers trained in the Public Works Department should possess the knowledge and experience necessary for keeping order among crowds of relief labourers, for exacting from them adequate tasks, and for turning their work to the best advantage; but works conducted under their agency are not free from the danger of providing insufficiently for those who are feeble or unable to give a fair out-turn of labour. District officers without professional training do not ordinarily possess the above qualifications in the same degree, and are commonly occupied with other duties. On the other hand, it is peculiarly the province of district officers to make arrangements for receiving applicants and admitting them to relief, for classifying them according to their strength and capacity for labour, for organizing them into gangs, and thus encouraging members of the same village to keep together.”

3. Large and Small Relief Works.

Relief-works again may be conveniently divided into small and large, that is to say, works employing (say) 300 *or* 500 *labourers for about one month only, and works employing a larger number of labourers for a longer period. Though this division generally corresponds with the division into civil and Public Works Department works, it does not necessarily do so; a small work might be under a Public Works Department officer, and a large one under a civil officer. State under what circumstances you consider small works to be admissible, and what the advantages and disadvantages attached to them are at different periods of a famine* page 106.

4. Tests for Admission to Works.

The three main tests hitherto adopted to justify the admission of persons to relief-works are—

The Distance Test.—Under which the need of relief is proved by willingness to go a certain distance to obtain it.

The Wage Test.—Under which the need of relief is proved by willingness to accept a wage which is little more than a bare subsistence.

The Labour Test.—Under which the need of relief is proved by willingness to do a fair day's work according to the strength of the labourer.

Would you propose to adopt any other tests than these? If so, describe them. Would you reject applicants for labour because their appearance, clothing, or the ornaments they wear do not indicate penury? If so, would you do this equally at the beginning, during the height, and in the decline of a famine? - page 111.

5. The Distance Test.

State how this test has been applied within your experience of famine, and how you think it should be applied. What amount of distance has been considered sufficient for the test? Was it enough that the labourers should have to go some distance to and from the work? Or was it insisted on that they should live away from their homes? If A is a work near village Z, and B is another work 10 *miles off, have the inhabitants of Z been refused admittance at A and directed to go to B? If so, what measures were taken to ensure that they did go to B? If the test has been relaxed, state under what circumstances. Has the test been effectual, and has it kept away persons who were not in distress? Has it been too severe and kept away people who were in distress? What modifications would you, from the experience now gained, propose in applying the test?* - - - - - - - - - - page 116.

6. THE WAGE TEST.

Where relief is given in the form of money wages, the wage will be chiefly based on the quantity, kind, and price of food required to support life, with a margin for condiments and contingencies. What are the assumptions as to the quantities of food to be given to labourers of different ages, sexes, and capacities for labour, and the extra allowance for condiments, &c.? Have you any data by which to test the accuracy or error of the assumption made as to the quantity of food required? State your experience as to the physical condition of labourers who have for some time subsisted on any given relief wage, giving the amount of that wage, and the quantity of food it supplies? What have you ascertained as to the actual kind and quantity of food purchased by labourers with their wage? How is the price ascertained of the standard kind of food on which the wage is based? How would you, with your present experience, formulate the conditions of the wage test? - - - - - - - - - - - page 128.

7. SYSTEM OF PAYMENT.

What is the best way of paying wages, daily or less frequently; at morning before work begins, during the day, or at evening when work is over; by calling out nominal rolls, or by tickets, or by a combination of these? To whom should the payment of wages be entrusted? Explain the system of supervision most approved by experience of checking payments and of preventing laxity and fraudulent practices in the disbursement of wages? Have labourers been paid in grain, or partly in grain and partly in money? Under what circumstances is this desirable, and, if necessary, how is it best arranged? Have wages ever been paid by tickets, on presentation of which at a trader's shop food would be delivered? What would you advise in this respect? - - - - - - - - - - page 155.

8. PREVENTION OF FRAUD.

What system do you recommend to prevent frauds by persons on the works, such as the receipt of wages by those who have not worked? What steps should be taken in the case of persons who have been absent at any of the roll-calls, or who have worked part of the day, but not all of it, or who, having worked during the day, are accidentally absent when wages are paid? - - - - - - page 165.

9. WAGES IN SICKNESS.

What wage should be given to those who are prevented from working by sickness (1) *when there is a hospital attached to the work,* (2) *when there is none?* - - - - - - page 167.

10. THE LABOUR TEST.

What are the principal descriptions of work on which fixed daily tasks are applicable, and what tasks have been insisted on? How are the labourers classified according to their physique; by whom and in how many classes? What steps are taken for raising labourers from one class to another, according as their physique improves, or vice versâ? How are they ganged, and into how large gangs? How is their work measured up; by whom, and how often? How are they punished for not completing their tasks? What steps should be taken to test the report of the measuring official to secure that the labourers are justly punished or deservedly paid in full? What steps are necessary to compel persons receiving relief to work? In those sorts of work on which it is impossible to apply the task test, what test can be applied to ensure that the labourers earn their wage properly? - - - - page 168.

11. PIECE-WORK.

Under what conditions, if any, is payment by piece-work practicable on relief-works, that is, payment for quantity of work done at a fixed rate, irrespective of the amount of daily earnings? What are the advantages and disadvantages of the system? When it is advantageous, how can it be best adopted on a large scale, and what precautions would be necessary to prevent its abuse? - - - page 176.

12. HOUSING, SANITARY ARRANGEMENTS, AND DISCIPLINE ON RELIEF WORKS.

What is the best form of hut for labourers on a relief-work, and what the best method of arranging them in a camp? What is the cost of hutting per head? Should the huts be erected by specially hired labour or by the relief labourers themselves? What points require consideration in selecting a site for such a camp? What sanitary arrangements should be prescribed in it, especially as regards latrines? What establishment is necessary to look after these arrangements? What Police or other establishment is necessary to preserve discipline and to prevent robberies? How should this be organized? - - - page 185.

13. BAZAAR ARRANGEMENTS IN CONNECTION WITH RELIEF WORKS.

What arrangements do you recommend for a bazaar? Should an arrangement be made with one man to supply the labourers on certain specified terms, or should any traders who wish to do so be permitted to open shops? If the supply of traders is for any cause insufficient, what steps should be taken to induce persons to open shops, or otherwise to provide for the sale of food, &c.? Where should the bazaar be located? Should the huts be erected for the traders at the cost of Government, or at their own cost? Should any supervision be exercised over what they sell (for instance, to exclude luxuries or unwholesome food), or over the prices at which they sell? and, if so, in what way? Should they be allowed to keep their shops open all the day, or only when the labourers are off work? - - - - - - - - - page 189.

14. HOSPITAL ARRANGEMENTS IN CONNECTION WITH RELIEF WORKS.

In what cases should a hospital be attached to a relief-work? What system of sanitary inspection of the labourers is desirable? How far should the sick be treated without being sent to hospital? If there is no hospital what arrangements should be made for those who fall sick? When a hospital is necessary, what should be the shape and material of the sheds, what space should be allowed to each patient, what clothing, bedding, &c., what provision should be made and what class of people entertained for cooking and nursing?

What professional supervision should be provided over the Hospital Assistant? What authority should be exercised over him by the Public Works Department officer, or the civil officer in charge of the work, if there is one? - - - - - - - - - - - - - - page 192.

15. RELIEF WORKS.—ADMISSION, CLASSIFICATION, AND PAYMENT OF APPLICANTS.

What system do you recommend for the admission of applicants for relief on works for securing that no hindrances are placed in the way of their coming, and no bribes taken for admission? How would you provide for classifying them and placing them on gangs? If payment is not made daily how would you arrange for their receiving advances till the first wage day comes round? And, if paid daily, what pay should be given to those who come on during the day and work for a broken period? - - page 196.

16. THE KEEPING OF REGISTERS ON RELIEF-WORKS.

What registers should be kept up of the number and classes of persons on the works, the numbers who are daily admitted, or who leave, the wages paid, the number punished by fine, the quantity and value of the work done? - - - - - - - - - - - - - page 200.

17. ORGANIZATION OF RELIEF-WORKS.

Describe the organization of a well-managed relief-work, the number of gangsmen and of labourers in each gang, of overseers over the gangsmen, of registering clerks and paying clerks or cashiers, and how the upper supervising staff is constituted. State also in what form, and at what periods, progress and other reports are sent up to higher authorities - - - - - - - - - page 201.

18. DISCHARGE OF LABOURERS FROM RELIEF-WORKS.

What arrangements would you propose for discharging labourers from relief-works when the famine is declining, or over, or when the work is closed? Has it been customary to give money to persons discharged to enable them to reach their homes and start again in their ordinary way of life? How have persons been dealt with who to the end continue in a physical state in which they are unable to support themselves?
page 206.

19. DESERTIONS FROM RELIEF-WORKS. MOVING BODIES OF MEN TO WORKS OVER LONG DISTANCES.

Has it been found that persons after admission to relief-works wilfully desert from them, and to what extent do such desertions commonly indicate excessive severity in the application of tests, insufficiency of food, or improper treatment of other sorts? Are they often due to other causes, and if so what? How should such results be guarded against? Under what circumstances would you recommend moving bodies of men to works over considerable distances? Should this ever be done as a preventive measure to weed out those who are not in absolute want of relief or only as a step that is expedient for the sake of transferring them from less useful to more useful work, or to admit of their being more easily fed or supervised, or to prevent sickness and the like? If the distance is more than one day's march, what arrangements should be made for hutting them for the night and for paying them or feeding them on the march? Narrate the history of any case within your knowledge in which more than 500 people were moved, or attempted to be moved, more than 20 miles, and state any difficulties the movement involved, and how they might best be avoided - - - page 210.

20. ASSOCIATION OF CIVIL WITH PUBLIC WORKS DEPARTMENT OFFICER ON A RELIEF-WORK.

Under what circumstances should a civil officer be associated with a Public Works Department officer in the management of a relief-work? What is the proper field of duties of the civil officer? What parts of the duties should be wholly under him and what parts should be entirely beyond his sphere? If it is proper for him in any way to interfere with or control the discipline of the labourers, the management of the camp and bazaar, the tasking, the measuring, and the payment of wages, state how this can best be done without undue friction and annoyance - - - - - - - - - - page 216.

21. THE REGULAR EMPLOYMENT OF ORDINARY IN CONJUNCTION WITH RELIEF LABOUR.

Besides the persons to whom employment is given with the special object of affording them relief, the Public Works Department usually employs on the works it carries out a large number of both skilled and unskilled labourers, who are dependent for their regular livelihood on the receipt of wages more or less all through the year. State how the continued employment of these may best be made compatible with relief labour if the works on which this class of men is employed are closed or turned into relief-works - page 221.

22. RELIEF-WORK FOR ARTIZANS, WEAVERS, &C.

Have you had experience of any kind of relief-work other than earth-work? If so, describe it. Has any attempt been made to employ artizans, such as weavers, smiths, carpenters, &c., in pursuing their own professions, and with what success? In the case of weaving or spinning when raw material is given out, and thread or cloth received back, is it best to pay the difference of price between the raw and the worked-up material, or to pay daily wages to the workers? State your views as to the best method of distributing the raw material and exacting a proper tale of work, and make any general suggestions on this subject that occur to you - - - - - - - - - - - - page 223.

SECTION 2.—GRATUITOUS RELIEF.

23. The Poor-house.

The commonest mode of administering gratuitous relief is through the poor-house. What is the proper situation for a poor-house so as to secure accessibility, discipline, space, water, and proximity to food supply? Is an enclosure wall or fence necessary, and of what should it be made? What total area is desirable in proportion to the whole number of inmates? What shape and material are best for the huts, and what sleeping space (in superficial area) should be provided for each inmate? How may they best be arranged with a view to ventilation, &c.? How should the latrines be placed and managed? What is the maximum number you would accommodate in one poor-house? How should the inmates be separated and classed together so as to provide for the requirements of caste, for the keeping of families together, and for the separation of the sexes in the case of persons who do not belong to families? - - - page 227.

24. Conditions of Admission to Poor-house Relief.

What should be the conditions of admission to relief in a poor-house? The usual conditions are (1) *inability to work on a relief-work;* (2) *willingness to reside within the enclosure;* (3) *willingness to accept cooked food. Under what, if any, circumstances may these be relaxed, or may the food be distributed without residence, or may uncooked food be given? What arrangements should be made for the admission of applicants, and to whom should the duty of selection be assigned?* - - - - page 236.

25. Compulsory Detention in Poor-house.

Under what circumstances does it appear desirable that entry into a poor-house should be made compulsory on persons who appear to be starving, or to be in such a state of want as to show that relief in some form is essential to the preservation of their lives? and under what circumstances would you allow them the discretion of refusing to submit to this? If compulsion is used to take them in, what steps are required to ensure their stopping there? How should such a rule be applied to vagrants, and how to persons on relief-works, or seeking relief otherwise? Does it appear necessary or expedient to obtain legislative authority for such action as may be desirable in these respects? If so, suggest what seems most suitable. Would there be any special objections to such legislation, having in view the risk of exciting fears in the population, or for other reasons? - - - - - - - - - - - - page 239.

26. Rations in a Poor-house.

What ration should be given to the ordinary inmates of a poor-house, and what special diet to those who are much reduced by innutrition? Have you any experience of the effects of the ration for adults which consists of 1 *lb. of raw flour with condiments? What is the proper quantity of condiments? State the results of your experience, as fully as possible, whether this ration has or has not shown itself sufficient to support life.* page 243.

27. Organization of a Poor-house.

Give as fully as possible your views as to the organization of a poor-house. State how the food should be purchased and stored; what stock register of it should be kept, and by whom; how given out to be ground; what the grinding task should be; how it should be received back and tested when ground; how given out to the cooking department; how information is to be given to the store-keeper or the head of the cooking department as to the number of rations required for adults and children, for ordinary, special, or sick paupers; in what way and in what vessels the food should be cooked; with how much water and fuel; what the weight of the cooked ration should be; whose duty it should be to test it; how it should be served out to the people; what discipline should be enforced among them while it is being served out and eaten. What precautions should be taken to see that it is eaten when received and not sold or exchanged, and that the children's portions are not taken from them by their parents or other adults? Under what circumstances should warm clothing be given, of what description, and at what probable cost per head? State what the rules of the poor-house should be as to the hours of rising, ablution, calling the roll-call, distributing food, going to and returning from work, and going to sleep. What arrangements should be made for personal ablution and washing clothes? What supervision is necessary to separate and take in time to hospital those who begin to sicken, or to distribute medicine to such as require it but are not sick enough for hospital? State what work the paupers can be set to, what is most suitable, for what cases, and how labour is to be enforced. What establishment is required (per hundred paupers) for cooking, grinding, sweeping the enclosures, cleaning the latrines, maintaining discipline, fetching water, or wood or grass for thatching, removing the sick to hospital, or carrying out and burying the dead? To what extent may such duties be performed by the stronger of the paupers, and in case suitable persons cannot conveniently be obtained from among them, how should the necessary establishment be paid? What amount of general supervision is necessary? What registers should be kept up as to cash outgoings, stores in stock and issued, daily number fed, and daily expenditure of food, sickness, and death? page 252.

28. Poor-house Hospital.

Refer to the questions regarding a hospital attached to a relief-work, and consider how far the arrangements suitable for such an establishment would also be applicable to a hospital attached to a poor-house. If any difference of system seems desirable, state in detail what seems requisite - - page 271.

29. Drafting of Inmates of Poor-house to Relief-works.

What system would you pursue for drafting into a relief-work those inmates of a poor-house who recover strength and health there and become fit for labour? - - - - - page 274.

30. Relief of Parda-nashin Women.

There are two classes who ordinarily receive gratuitous relief without being inmates of poor-houses. The first is parda-nashin, or gosha, women. What test can be applied to prove their necessity? Would you inquire into their cases through an official or a non-official? Supposing they have hitherto been dependent on a person who now refuses to support them, would you admit them to relief, or require him to support them if he is able to do so (1) *if they have close natural ties to him,* (2) *if they have not? Supposing the necessity of relieving them to be established, how would you relieve them, with money or food, or by giving work, such as cotton to spin, or grain to grind? How often should this relief be given, and in what quantity? When, and under what circumstances, should this relief cease? Have cases occurred in which dependants of persons in easy circumstances have claimed or obtained relief, and how have such cases been dealt with?* page 275.

31. Village Relief of Infirm or Sick.

Another class consists of the sick, infirm, cripples, and bedridden folk, in towns or villages, who cannot leave their homes. How would you organize a system for relieving them? How inquire into and ascertain their cases? How convey relief to them when they are put on the registers, and what relief should it be? When should relief of this kind be closed? - - - - - - - - page 280.

32. Orphans and Deserted Children.

What has been held to be the duty of Government in respect to orphans or deserted children, and what appears to be the correct principle to follow? What number of such children have been thrown on the State during the recent famine? What arrangements have heretofore been made for receiving and supporting them, and what has been their ultimate destination? What have been the practical results of the measures thus taken in the past? What appears to be the best system to adopt in the future? - - - page 285.

33. Purchase of Grain by Government and Sale Below Market Rate.

Another form of relief, independent of a labour test, is by purchasing grain and selling it at or below cost price, and consequently below the retail market rate. Was this measure resorted to in your district, under what circumstances, and with what results? Do you consider that there are any conditions under which it is proper for Government to have recourse to such a step? (*This question does not refer to the propriety of Government importation generally, but of importing or purchasing in order to sell cheaper than the market rate*) - - - - - - - - - - - - page 288.

SECTION 3.—MISCELLANEOUS.

34. Proportion of Persons Relieved to Whole Population.

State as nearly as practicable the proportion that the whole number of persons that were in receipt of relief in any form in your district on a selected day, or on the average of some week, when the recent famine was at its height, bears to the whole population. Of the whole number so receiving relief, what were the proportions under the following heads:—

1. *On relief works* - - - - -	*Adult males.* *" females.* *Children.*
2. *Artizans specially employed* (*if any*) *as such* - -	*Adult males.* *" females.* *Children.*
3. *In poor-houses* (*resident*) - - - - -	*Adult males.* *" females.* *Children.*
4. *Relieved non-resident (para.* 30) - - - -	*Adult males.* *" females.* *Children.*
5. *Relieved in villages (para.* 31) - - - -	*Adult males.* *" females.* *Children.*
6. *Others, not resident* - - - - - -	*Adult males.* *" females.* *Children.*

page 293.

35. Emigration.

Has Government ever attempted to organize emigration, permanent or temporary, from districts suffering from famine to other parts of India, or foreign countries, as a relief measure? If so, with what success? Under what circumstances could any such emigration be organized or encouraged? To what extent has emigration been resorted to by the people voluntarily? Have any gone beyond sea? Have any permanently gone off to settle in other parts of India? How many (*approximately*) *left their district on a temporary expedition to search for food or employment elsewhere during the recent famine? Did they go alone or with all members of the family, and with their cattle and property? Where did they go to, and were their hopes of alleviating their distress realized? How many* (*approximately*) *have not come back, and how many are supposed to have died?* - - - - - - - - page 297.

36. THE CONTROL OF AIMLESS WANDERING.

If famine-stricken people begin to emigrate to a part where it is known they would not find things better than in the country they left, or if they wander aimlessly from their homes, settling nowhere, should steps be taken to stop this, and how? Would you employ the police under any circumstances to turn them back, or to compel them to go to relief-works or poor-houses? or would you let them learn by their own experience? If they crowd into a town, say the head-quarters of the district or the province, would you do anything to stop them on the way, or to prevent their begging and straggling about the town when they get there? Refer to paragraph 25 in answering this question, and add anything that seems requisite in relation to the points now raised - - - - - - - - - - - page 304.

37. REMISSION AND SUSPENSION OF THE REVENUE DEMAND.

Is it a recognized feature of the Revenue administration in your district to give relief by the remission or suspension of the demand for land revenue when the crops fail? If there are any established rules, quote them. Is the land revenue assessment based on the principle that profits of good years should cover losses in bad years? Is it assumed that a sufficient margin of profit is left to the landholders to admit of the regular payment of the revenue under all vicissitudes of season, or only in the ordinary fluctuations that occur, excluding seasons of extreme drought? What is the practical state of the case? How far is it found to be possible to collect the land revenue in a year when the crops have totally failed, without pressing unduly on the landowners? What amount of failure of crops is held to justify what amount of leniency in collection? Where the occupier of land pays rent to a landlord, how is the payment of such rent affected by failure of crops, and to what extent does the remission or suspension of land revenue lead to corresponding treatment of rent? What are the arguments in favour of giving relief in the form of remission or suspension, respectively? To what extent has it been customary in actual practice in your district or province to remit or to suspend in such cases? Up to what limits do you consider that it is practicable to recover in future years the postponed demand of bad years, or does suspension practically mean remission in all but a few cases? - page 307.

38. VILLAGE INSPECTION. DISINCLINATION TO SEEK RELIEF.

Is the duty of searching out distress in time of famine in the villages and the people's homes one that properly belongs to Government, or is it sufficient for Government to offer means of obtaining relief, and to expect that the famine-stricken will come of themselves and make use of those means? If it is proper to depute special officers to inspect villages and urge the people to accept the relief offered, what steps do you consider necessary for strengthening the ordinary district staff and enabling them to carry out this duty? What class of officers should be selected for such duties, and what areas assigned to them? May these officers best be servants of Government, or should they be taken from the non-official class? What should be their precise duties, and what supervision should be provided to see that they carry out those duties? At what period may it become expedient to organize such an extra famine establishment? To what extent, and under what general circumstances, has there been any tendency on the part of the people in distress to reject measures of relief offered to them? Where determined disinclination has been shown by any portion of the population to leave their villages and go to relief-works or poor-houses, what has been the probable cause of such a state of things? Can it be traced to improper arrangements for the reception of applicants for relief, or for admitting them to employment on works, to an insufficient allowance of food, or wages, or to any such causes? Can any other causes be named which may have conduced to the disinclination to seek relief, such as physical prostration, or habitual want of confidence in officials, &c.? - - - - - - page 318.

39. EXPEDIENCY OR OTHERWISE OF STORAGE OF GRAIN BY GOVERNMENT.

Did you in the recent famine lay in any stores of Government grain for the purpose of feeding labourers or inmates of poor-houses? Was anything done to stimulate trade by offering advances of money or any kind of assistance or bonus to merchants? Did the Government purchase grain, import it, and sell it again to the general public with the object of keeping the local markets supplied? If any such measures were taken, state the circumstances under which the transactions occurred, the reasons which led you and your superior officers to think them necessary, the manner in which grain was purchased and imported, the quantity, cost, and price at which it was disposed of, and the monetary gain or loss realized; or the nature of the advance or bonus given to traders: whether it checked private imports; also the general effect of the whole transaction. If you did not take any such step, do you now consider that it would have been better to do so? If you did it, or it was done, do you think any error was committed in so acting? And generally what are the conditions under which such measures are proper and necessary? - - - - page 327.

40. ABILITY OF THE ADMINISTRATION TO COPE WITH FAMINE EMERGENCIES.

Do you consider that the events of the last famine have shown that the system of civil administration in your district is strong enough to bear the unusual strain laid upon it, or that any defects have been discovered which might be obviated? Is the area of your district too large for one man to supervise, or of a convenient size? Are your official relations with the officers of the Public Works Department in your district such as are most conducive to the carrying on of relief work? What staff of civil officers have you to carry out your orders, and what duties and responsibilities attach to each? Is that staff of the proper strength and organized in the best possible way, or can you suggest any improvements? Have your native subordinates as a class shown energy, capacity, humanity, and physical activity in carrying out relief measures, or have they been wanting in these qualities? Give a general outline of the manner in which the relief operations in your district were conducted. To what extent did your control go, to what extent was there local independence of action? How was the chain of responsibility maintained between the superior and subordinate officers? How far were you yourself controlled in the relief administration, and how far left to act on your own discretion?
page 335.

41. SYSTEM OF CORRESPONDENCE AND CHAIN OF OFFICIAL RESPONSIBILITY.

Through what channels have orders relating to famine relief reached you from the Government? If references were sent by you, and orders received by you, from the Government or its representative in the

Famine Department direct, state whether you think that course operated well, whether the necessary business was rapidly conducted with consistency and precision, and with due attention to the exigencies of special circumstances and localities, &c.? Do you think this course best, or that the work would have been more effectually done had there been an official (whether Commissioner or Member of the Revenue Board, or by whatever name called) who should have been in administrative charge of a group of districts, and would thus have become acquainted with their wants and circumstances by personal inspection? If, on the other hand, you received the orders of the head of the Government through any intermediate authority, state if, in your opinion, there were any disadvantages attaching to this course, such as weakening the sense of personal responsibility in the local executive officers, delay in replying to references, or want of uniformity of method in different parts of the province, and so forth? - - - - - - - - page 346.

42. Financial Control and Audit of Expenditure.

Under what financial control were the operations placed as to the supply of funds and authority to spend money, or sanction and commence works? State generally the system adopted, and what you think of it? Mention if any irregularities or frauds took place in the application of money, or were supposed to have taken place, and how and to what extent? Is it anywhere currently reported that any persons of any class engaged in the relief operations have become subsequently enriched, or is there reason to think that peculation or malversation were rare and exceptional? Were sufficient means available for checking the expenditure and rendering and auditing the accounts? How was this part of the operations conducted and with what general results; has the whole of the outlay been satisfactorily accounted for or not, and if not, what deficiencies have arisen and in what manner, and how have they been dealt with? - - page 349.

43. Proper Field for Private Charity in Various Stages of Famine.

What do you consider the proper field for private charity in the beginning, at the height, and in the decline of a famine? To what objects should it be applied, and through what channels? Should the funds be expended by Government servants who are also at the same time carrying out relief measures? Should they be expended in saving life and giving food? or should that be left entirely to Government, and the charitable funds confined to other objects, such as setting people up again in their pre-famine position, starting them again with a little capital, and thus assisting them with appurtenances which, though not luxuries, are not absolute necessities of life? - - - - - - - - - page 353.

44. After Effects of Famine on the Country.

What has the effect of famine been in your experience on the subsequent condition of a district? Where villages were deserted have they been permanently depopulated, or has the population returned to them? Has much land been thrown out of cultivation, and for how long has this decrease in the cultivated area continued? Has it been due to want of cultivators, of plough bullocks, or of capital and of seed grain? - page 355.

45. After Effects of the Recent Famine.

In the case of the recent famine what effects, such as those just referred to, have been produced? How many villages have been deserted, how many have been seriously affected; what is the reduction in the area under cultivation now compared with what it was two years ago? How many holdings have been abandoned? Have the landlords, or ryots with whom the settlements are made, been permanently impoverished in a serious degree? Is there any reason to anticipate increased difficulty in realizing rents or land revenue for the next few years by reason of the recent pressure, if the seasons are favourable? What proportions of landlords or ryots are likely to be dispossessed of their holdings through the action of the Revenue or Civil Courts, as a consequence of distress produced by the famine? Has the agricultural population, which has no beneficial interest in the land, suffered more in proportion than other classes? - - - - page 358.

CHAPTER IV.

FAMINE PREVENTION.—PREPARATION OF SCHEMES OF WORK FOR FUTURE USE.

1. Practical Use of such Schemes.

After 1868 *the Government of India gave instructions that schemes of works should be prepared, suitabl for execution in the event of famine. Were such schemes ever prepared? If so, have they been found o practical use during the recent pressure?* - - - - - - - - page 362

2. Difficulties of keeping them up.

Do there appear to be any difficulties in the way of keeping up such schemes in a form which will be really useful in the future? - - - - - - - - page 364.

3. Class of Works to be included.

What classes of works would be included in them? Would the works differ in character from the ordinary works of utility brought forward for execution from time to time? And, if so, how? Give a practical example of works now considered suitable to be taken up as elements of such a scheme in two or three districts, if possible - - - - - - - - page 367.

4. Authority for their Execution.

Should the works in such a scheme be looked on as immediately available for giving employment as relief works at the discretion of the local Governments, or under what circumstances might the authority of the Government of India be held to be required? - - - - - - page 375.

5. Responsibility for their Maintenance.

If severe drought, calling for the employment of labour on a very large scale, and in an exceptional manner, occurs at comparatively long intervals, how will it be best practicable to arrange for suitable projects, which, though suspended, must yet be fit for early execution? On whom should the responsibility of maintaining such schemes in an efficient state rest, and how could it be enforced? - - - page 376.

6. Their Relation to Numbers requiring Relief.

What number of persons is likely to be thrown on relief works in an extreme case, and how should such a scheme be framed as to indicate what portions of it should be taken up on any particular occasion in order to provide for the employment of the anticipated numbers and for the length of time required? - page 378.

7. Should they include Works of doubtful Financial Value?

Should the works include only such as had been sanctioned for construction under the regular rules on such subjects, or would it under any circumstances be right to include in such a scheme large works to which sanction had not been given on account of their doubtful financial value, and their not being of a character that would justify their execution under ordinary circumstances? How far might there be risk of the Government being led into unprofitable expenditure in the completion of works of this sort begun under plea of famine pressure? - - - - - - - - - - page 385.

8. Value of Unskilled Labour during Famine.

Is it probable that the amount of work executed by unskilled labour on any large work during the pressure of famine would be such that the exclusion of the expenditure on it would reduce the ultimate cost of such a work in any important degree, so as to be likely to render it remunerative, though if otherwise executed it would not have been remunerative? Can any illustration be given of such a case as that last referred to? - - - - - - - - - - - page 387.

9. Should large Works not sanctioned by proper authority be included.

Could large works not sanctioned by proper authority, for whatever reason, be properly included in the scheme of works, and if so, what preliminary steps should be regarded as requisite before actually putting them in hand if severe scarcity arose? - - - - - - - - page 390.

10. Risks attending Absence of prepared Schemes.

Considering the circumstances under which labour is applied on relief works, is the risk of waste by reason of there being no regularly prepared scheme ready really great? Is there danger, in the absence of suitable projects ready for immediate execution, of the suffering population being left without proper relief until the necessary relief works have been prepared for execution? How far might the intelligent action of the several branches of the Public Works Department be made to supply, from among projects in course of execution or ripe for it, what was requisite? Could this end be sufficiently secured by distinctly making the Public Works Department responsible for bringing forward suitable works whenever pressure from scarcity arose; and, so far as was necessary and practicable, setting aside or postponing the ordinary work not suitable for relief purposes? - - - - page 392.

11. Difficulty of finding suitable Relief Works.

Has there been practical difficulty in finding suitable relief works during the recent pressure? If so, where and how? Make any suggestions on the subject of providing relief works which may aid in meeting the difficulties that are found to arise in practice - - - - - - - page 396.

IRRIGATION WORKS.

12. Cost of Construction and Maintenance. Area Irrigated and Value of Crops.

What is the capital expended to date in the construction of the principal canals in your province, and what the yearly interest on that capital? What is the annual cost of maintenance? What is the present acreage irrigated? From this calculate the several corresponding rates per acre. What is the average local value per acre of the chief crops raised by irrigation from these canals? What is the difference between this and the average value of such crops raised without irrigation? - - - - page 400.

13. Water Rate and Increased Rent, Revenue or Owners Rate.

What is the amount per acre paid for the use of water for the chief crops by the occupier in the shape of water rate? What is the ordinary increased rent on irrigated over unirrigated land? What is paid by the proprietor per acre in the shape of land revenue or owner's rate? Is there any reason why a proprietor, whether paying land revenue or not, the yearly value of whose lands is increased by irrigation from canals constructed and maintained at the public cost, should not contribute to the State in return for the advantage he thus obtains? What seems to be the best way of obtaining such a contribution from him, first, where the land revenue is liable to revision; secondly, where it has been permanently settled; and thirdly, where the land is not charged with revenue? - - - - - - - - - - page 410.

14. Collection of Canal Dues. Distribution of Water.

In what way, and under what law, are the canal dues recovered in your district? Has there been found to be any difficulty in applying the law in any particular, and if so, how? And what better system can be suggested? It is commonly said that water is used in too lavish a manner by agriculturists when the charge is made on the irrigated area, or otherwise than by the quantity supplied. Is this the case, and what remedies can be applied? Will raising the water rate have the effect of preventing this? To what extent is this likely to have a tendency to throw the poorer crops out of cultivation, or to confine irrigation to the more paying crops? Is water charged for by quantity, and can this be done? Is it ever charged for on a contract system, a whole village or the proprietors or cultivators of a certain portion of the village lands paying a lump sum periodically for the water supplied to those lands through a given aperture? Is this system a good one? What are the difficulties attending it? Where it is adopted what arrangement is made for distributing the water among the cultivators? Have complaints practically arisen where the system has been in force, and how could they best be guarded against? Does there appear to be any objection to making such a system of contract compulsory where the general advantage of the cultivating community calls for increased economy in the use of a limited supply of water? - - - - - - page 419.

15. Water Rate in relation to Cultivator's Margin of Profit.

Having reference to the margin of profit on irrigated crops commonly left to a cultivator after payment of the existing water rates, could these rates be increased without trenching unduly on that margin of profit? How would raising the water rates operate on a cultivator under a lease, and how on the revenue-paying proprietor, if it took place during the currency of the lease or settlement respectively? - page 425.

16. Preparation of Statistics.

How are the statistics of irrigation recorded, and are revenue reports of the chief irrigation works prepared by the canal administration, and in what form? Do you think them necessary? To what extent do you think the record of such statistics valuable or necessary for the proper administration of irrigation works? To what degree of detail may the record usefully go, and how may the facts be best collected and recorded? - - - - - - - - - - page 428.

17. Some mischievous Effects of Canal Irrigation.

What evidence is there as to any mischief being caused by canal irrigation, such as by increasing sickness, or injury to the land by raising the water level, or production of efflorescent surface salts, &c.? To what extent has drainage accompanied, or ought drainage to accompany, canal irrigation? Has the provision of needful drainage been neglected? Is additional drainage needed to meet the effect of the increased quantity of water thrown on the surface, or to remove obstructions caused by canals, channels, water-courses, &c.? - - - - - - - - - - page 430.

18. Purification of Soil.

Has canal irrigation anywhere been combined with attempts to improve soils previously unfit for cultivation from the presence of noxious salts? - - - - - - page 433.

19. General Effect of Irrigation on the Character of Cultivation.

What has been the general effect of continued canal irrigation on the character of the cultivation? Has the irrigated area of the poorer grains, which supply the chief part of the food of the people, been gradually diminished, and has the area of the better crops been increased? If the area of poorer crops has been reduced, is this due to conditions of soil or position of lands and difficulties of access from the water supply, or to the relative profits in the one case being greater than in the other? State the general facts as *to the changes in the areas irrigated during the last* 10 *or* 12 *years, and make any comments that seem desirable. Is there reason to suppose that prolonged irrigation damages the land under any circumstances? Is there any evidence of a reduced production?* - - - - - - page 434.

20. INUNDATION CANALS AND WELLS.

Under what conditions is an inundation canal, giving water only during the rainy season, found to be useful? To what extent is it probable that such irrigation could be usefully attempted in the North-Western Provinces, or elsewhere where not now applied, and where a water supply is available? How far would such irrigation be useful for rabi or kharif cultivation? How far may wells be depended on to supplement the deficiencies of supply in such a canal during the dry season? - - - page 440.

21. CANAL ADMINISTRATION.

What is the system of canal administration? Who is responsible for distributing the water and for collecting the dues? May the functions of the engineer in charge of the works and the technical business of the water supply, and those of the officer responsible for seeing that the available water is distributed equitably to the land that most requires it, and securing water to the extension of irrigation and the realization of the canal revenues and their due assessment and increase, be best combined, or should they be kept separate? State the reasons for your opinions - - - - - - - page 442.

22. CANAL ADMINISTRATION.

What system actually prevails in your province, and if you think it susceptible of improvement, say how? Do you think a special canal law necessary to admit of proper administration? And have you such a law, and is it satisfactory? - - - - - - - - - page 442.

23. SLOW EXTENSION OF USE OF CANAL WATER.

Why has the extension of the use of canal water been commonly so slow? What has been the nature of the obstacles, and how can they best be avoided or removed? Are any of the canals now in an unsatisfactory condition in these respects, and can any sufficient explanation be given of the want of progress? This question would specially apply to the Orissa canals, and to the works of the Madras Irrigation Company, with reference to which last see question No. 30. *Have any of your canals practically reached the state in which any further extension is not likely, or is likely to be small? Say how far this is the case in each. Are difficulties met with in preparing land for irrigation for the first time, in the way of subdividing fields, or levelling the surface, or formation of water-courses, which require more time and money than can be supplied by a limited population otherwise than slowly? If such difficulties are met with, how may they best be removed? Does the existing system provide sufficiently for making advances to cultivators to adapt their land to irrigation, and if not, what changes are desirable? Does shortness of supply during the hot season materially affect progress of canal irrigation?* - - - - - page 449.

24. MODE OF MEETING CHARGES ON UNREMUNERATIVE BUT NECESSARY WORKS.

Where the financial prospects of projected irrigation works are not such as to appear to justify the outlay of public money on them, in the expectation of the income being at an early date sufficient to cover all the expenses, including the charge of interest on capital outlay, do you think that a special rate to make good the deficiency might properly be charged on the district for the benefit of which the works are designed, or on the land that would be protected, and if so, under what conditions? If not, what are your objections? How would you meet the case put in this question if not by some such special rate? Is it more equitable to place a compulsory charge on other districts, which can probably derive no advantage from the works, or only on the districts or lands that can benefit? If the protection to be given by such works to particular districts is deemed of great importance, under conditions such as have been above stated, what course do you think should be taken, having regard to the necessity for protecting the general finances of the country? page 454.

25. EXISTENCE OF CUSTOMARY CLAIMS TO USE OF WATER.

Have any customary claims or prescriptive rights in the use of water from tanks or canals or water-courses grown up in your district? What is their nature and history? Have they led to inconvenience in respect to the general utility of such works to the agricultural community that might benefit by them? Would it, in any case that you know, be desirable to buy out such rights as exist, and to prevent the accretion of others? Have such claims or rights to the use of the water in the upper parts of rivers obstructed the application of the water in the lower parts to purposes of irrigation, or vice versâ? If this has happened in any case, could any remedy be applied which would be equitable? How should disputes on such points be settled? In cases in which the action of the ordinary courts would be impossible or inapplicable, what principles should govern decisions in such disputes? - - - - - - page 459.

26. MAINTENANCE OF CERTAIN WORKS BY CULTIVATORS.

If anywhere it be found that the tanks, &c. are so small and numerous that Government cannot practically carry out their supervision and maintenance, would it be expedient that steps should be taken for imposing on the cultivators or proprietors who benefit by the water the duty of carrying out all necessary repairs or works for securing the irrigation in an efficient condition? Do you think this principle should apply to all tanks, great and small alike? Might the obligation equitably be held to attach without any corresponding relief being given, or should any privileges (such as lowered rent) be conceded to the ryots, if they are charged with the duty of repair? To what extent should the liability go, whether only to minor works not requiring engineering skill, or to all work? How could such a duty be best enforced, and any neglect of repairs checked at its inception? And what penalties should be legalised to punish such neglect when it does occur? Is there any local or other fund from which to pay for such work if it consisted of more than ordinary earth-work? Could such a fund, in case of need, be established? - - - page 464.

27. OBLIGATION OF ZEMINDARS TO MAINTAIN TANKS, &C.

How far do obligations rest on zemindars or other superior landholders to maintain tanks or other irrigation works? Are such obligations properly recognized where they exist, or is any additional power called for to enforce them? Where they do not now exist, are there circumstances or localities in which it would be expedient to impose them on some such basis as that referred to in question No. 26, *and if so, on what general system should it be done?* - - - - - - - - page 469.

28. MADRAS ACT NO. VII. OF 1865 (WATER CESS).

What are the rules made under Madras Act No. VII. of 1865? *Give a statement of the works to which this Act has been applied, and what is the revenue realized by means of it? Give an illustration of the cases in which exemptions are granted under section* 4 *of the Act. What is the nature of the receipts entered in the Miscellaneous Land Revenue under the head "Cess for repair of tanks?"* - - page 471.

29. DISTRIBUTION OF WATER WHERE SUPPLY IS DEFICIENT.

How has the distribution of water been fixed where the supply is less than the demand? Do customary or other established rights interfere with the extension of irrigation from any Government canal, and if so, where and to what extent, and what remedy should be applied? Is it the duty of anyone to see that the available water is made use of to the best possible advantage for the community as a whole, and on whom does the duty fall? Is there any difference in the system of supplying canal water to lands under ryotwari settlement and under zemindari settlement, where the two exist, and what is it? - - - page 472.

30. MANAGEMENT BY PRIVATE AGENCY.

Is there any special difficulty introduced into the spread of irrigation by the intervention of the agency of a company in the management of a canal, and how could such difficulties be best overcome? - page 473.

31. DIRECT AND INDIRECT RETURNS.

In reckoning the return obtained from the outlay on canals or other irrigation works, is full credit given them under the existing system of accounts? Where separate water rates are charged on the cultivators, is the indirect profit obtained by the increase of land revenue properly taken into account? Where there has been no distinction made in the payment to Government between the charge made as land revenue and that for the supply of water, is the canal revenue fairly estimated at present, and if not how do you think it would be best reckoned? - - - - - - - - - - page 474.

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Mr. J. C. Macdonald, C.S.	Superintendent, Tarai -	- - - -	IV.—Q. 3, p. 368.
Captain G. F. L. Marshall, R.E.	Executive Engineer, Saharunpur.	- - - -	III.—Q. 3, p. 106. Q. 7, p. 156. Q. 8, p. 165. Q. 9, p. 167. Q. 15, p. 196. Q. 20, p. 217.
Mr. C. W. Mellor, C.S. -	Officiating Collector, Bareilly.	- - - -	II.—Q. 2, p. 12. Q. 3, p. 20. Q. 6, p. 45. Q. 7, p. 63. III.—Q. 32, p. 286.
Surgeon E. Mulvany -	Civil Surgeon, Rae Bareli	- - - -	III.—Q. 26, p. 244.
Mr. W. E. Neale, C.S. -	Settlement Officer, Hamirpur.	- - - -	III.—Q. 37, p. 309.
Captain D. G. Pitcher, B.S.C.	Judge, Small Cause Court, Lucknow.	- - - -	II.—Q. 1, p. 4. Q. 4, p. 23. Q. 7, p. 64. III.—Q. 35, p. 298. IV.—Q. 3, p. 367.
Surgeon-Major C. Planck	Sanitary Commissioner -	- - - -	III.—Q. 6, p. 134. Q. 23, p. 228. Q. 26, p. 246. Q. 27, p. 257.
Mr. W. C. Plowden, C.S. -	Commissioner, Meerut -	- - - -	II.—Q. 4, p. 23. Q. 5, p. 26. Q. 7, p. 63. IV.—Q. 1, p. 362. Q. 2, p. 365. Q. 4, p. 375. Q. 5, p. 377. Q. 6, p. 379. Q. 7, p. 385. Q. 10, p. 393.
Surgeon-Major C. Prentis -	Civil Surgeon, Gorakhpur	- - - -	III.—Q. 6, p. 132. Q. 28, p. 272.
Mr. J. Quinn, C.S. - -	Deputy Commissioner, Hardoi.	- - - -	II.—Q. 5, p. 30. Q. 6, p. 48. Q. 7, p. 64. Q. 8, p. 68. Q. 9, p. 72. III.—Q. 5, p. 118. Q. 6, p. 132. Q. 21, p. 221. Q. 30, p. 276. Q. 31, p. 281. Q. 35, p. 299. Q. 36, p. 305.
Colonel J. Reid, B.S.C. -	Commissioner, Lucknow	- - - -	II.—Q. 2, p. 13. Q. 5, p. 29. Q. 6, p. 47.
Mr. M. W. Sandys, C.S.	Collector, Budaon - -	- - - -	II.—Q. 1, p. 2. Q. 2, p. 12. Q. 3, p. 20. Q. 4, p. 23. Q. 5, p. 27. Q. 6, p. 44. Q. 8, p. 68. Q. 9, p. 71. Q. 10, p. 78. Q. 11, p. 80. Q. 12, p. 84. Q. 13, p. 88. Q. 19, p. 211. Q. 27, p. 254. Q. 29, p. 274. Q. 30, p. 276. Q. 37, p. 307. III.—Q. 2, p. 91. Q. 4, p. 111. Q. 6, p. 130. Q. 7, p. 156. Q. 10, p. 169. Q. 11, p. 178. Q. 15, p. 196. Q. 20, p. 217. Q. 24, p. 236. Q. 25, p. 239. Q. 26, p. 244. Q. 32, p. 285. Q. 34, p. 293. Q. 35, p. 297. Q. 36, p. 304. Q. 38, p. 318. Q. 39, p. 327. Q. 40, p. 336. Q. 41, p. 346. Q. 42, p. 349. Q. 43, p. 353. IV.—Q. 8, p. 388. Q. 9, p. 391. Q. 10, p. 394. Q. 11, p. 397.
Mr. A. Sells, C.S. - -	Collector, Muzaffar	- - - -	II.—Q. 2, p. 12. Q. 3, p. 20. Q. 6, p. 43. Q. 7, p. 63. Q. 8, p. 68. Q. 9, p. 71. Q. 12, p. 84. Q. 13, p. 87. IV.—Q. 3, p. 369. Q. 4, p. 375. Q. 7, p. 385. Q. 9, p. 391. Q. 10, p. 394. Q. 11, p. 398.
Mr. J. Sheldon - -	Executive Engineer -	- - - -	III.—Q. 15, p. 196.

Name.	Office.	Experience.	——

NORTH-WEST PROVINCES—*continued.*

Name.	Office.	Experience.	——
Mr. R. D. Spedding, C.S.	Officiating Collector, Gorakhpur.	- - - -	II.—Q. 5, p. 29. III.—Q. 35, p. 298. IV.—Q. 1, p. 362. Q. 11, p. 297.
Mr. T. Stoker, C.S.	Assistant Collector, Mirzapur.	- - - -	II.—Q. 2, p. 13. Q. 4, p. 23. Q. 9, p. 72. Q. 11, p. 81. III.—Q. 2, p. 91. Q. 4, p. 111. Q. 6, p. 131. Q. 18, p. 207. Q. 24, p. 236. Q. 26, p. 246.
Mr. R. H. Story, C.S.	Deputy Commissioner, Jalaun.	- - - -	III.—Q. 19, p. 211. Q. 22, p. 224. Q. 24, p. 236. Q. 26, p. 244. Q. 30, p. 276. Q. 32, p. 286. Q. 33, p. 289. Q. 34, p. 294. Q. 35, p. 297. Q. 44, p. 355.
Dr. T. M. Sullivan	Civil Surgeon, Basti	- - - -	III.—Q. 6, p. 131.
Captain R. P. Tickell, R.E.	Executive Engineer, Ganges Canal.	- - - -	IV.—Q. 19, p. 438.
Mr. T. B. Tracy, C.S.	Collector, Moradabad	- - - -	II.—Q. 2, p. 12. Q. 3, p. 20. Q. 5, p. 27. Q. 6, p. 44. Q. 7, p. 63. Q. 9, p. 71. Q. 13, p. 88. III.—Q. 5, p. 118. Q. 6, p. 130. Q. 7, p. 156. Q. 10, p. 169. Q. 19, p. 211. Q. 31, p. 280. Q. 34, p. 293. Q. 36, p. 304. Q. 38, p. 319. Q. 39, p. 327.
Vikar Ali Bey	Deputy Commissioner, Saharunpur.	- - - -	III.—Q. 25, p. 239.
Surgeon-Major W. Walker	Inspector General of Prisons.	- - - -	III.—Q. 6, p. 137, 138.
Mr. R. Wall, C.S.	Late Officiating Collector, Banda.	- - - -	III.—Q. 5, p. 118. Q. 25, p. 240. Q. 30, p. 276. IV.—Q. 8, p. 287.
Mr. G. E. Ward, C.S.	Officiating Collector, Jaunpur.	- - - -	IV.—Q. 11, p. 397.
Mr. C. W. P. Watts, C.S.	Collector, Faruckabad	- - - -	IV.—Q. 3, p. 369. Q. 8, p. 387. Q. 11, p. 397.
Mr. H. B. Webster, C.S.	Commissioner, Jhansi	- - - -	II.—Q. 1, p. 4. Q. 2, p. 13. Q. 5, p. 28. Q. 6, p. 45. Q. 7, p. 63. Q. 9, p. 72.
Mr. P. Whalley, C.S.	Officiating Collector, Mainpuri.	- - - -	II.—Q. 3, p. 20. Q. 4, p. 23. Q. 6, p. 45. Q. 7, p. 64. Q. 9, p. 72. Q. 10, p. 78. Q. 11, p. 80. III.—Q. 18, p. 207. Q. 22, p. 224.
Mr. P. J. White	Deputy Commissioner, Jalaun.	- - - -	II.—Q. 6, p, 46.

BENGAL.

Name.	Office.	Experience.	——
Mr. H. E. Abbott	Manager, Indigo Factory, Muzaffargarh.	- - - -	II.—Q. 2, p. 15. Q. 8, p. 68. III.—Q. 5, p. 120. Q. 33, p. 290. Q. 39, p. 330.
Mr. J. P. Armstrong	Executive Engineer, Irrigation Department.	Agra, 1860-61. Behar, 1874. Threatened scarcity, Mudhoobunnee and North Bhagulpore, 1875-76. Nellore (Madras), 1877-78.	III.—Q. 4, p. 112. Q. 5, p. 120.
Mr. G. N. Barlow, C.S., C.S.I.	Commissioner, Bhagulpore.	Orissa, 1866. Behar, 1873-74, but never in charge of relief operations.	II.—Q. 1, p. 5. Q. 2, p. 14. Q. 3, p. 21. Q. 5, p. 31. Q. 6, p. 49. Q. 7, p. 64. Q. 9, p. 72. Q. 10, p. 78. Q. 12, p. 84. Q. 13, p. 88. III.—Q. 25, p. 240. Q. 32, p. 286. Q. 33, p. 289. Q. 34, p. 294. Q. 35, p. 300. Q. 37, p, 313. Q. 38, p. 320. Q. 39, p. 327. Q, 44, p. 356.
Mr. F. G. Brookes	Executive Engineer, Irrigation Branch, P.W. Department.	Orissa, 1867. Bengal, 1874. Madras, 1877, in charge of portion of East Coast Canal.	II.—Q. 2, p. 15. Q. 6, p. 52. III.—Q. 5, p. 120. Q. 6, p. 142.
Colonel J. Burn, B.S.C.	Manager, Durbhunga Estate.	Bengal (Durbhunga), 1873-75.	II.—Q. 5, p. 31. Q. 9, p. 73. III.—Q. 5, p. 119. Q. 10, p. 170. Q. 13, p. 189. Q. 30, p. 276. Q. 39, p. 328. Q. 44, p. 356.
Colonel Cadell, R.E.	Officiating Chief Engineer, P.W. Department.	- - - -	IV.—Q. 1, p. 362. Q. 2, p. 366. Q. 3, p. 369. Q. 5, p. 377. Q. 7, p. 386, Q. 8, p. 388. Q. 9, p. 391. Q. 10, p. 394. Q. 11, p. 398.
Mr. M. Finucane, C.S.	Settlement Officer, Durbhunga.	Bengal, 1873-74. Scarcity, Durbhunga, 1875-76.	II.—Q. 5, p. 33. Q. 6, p. 50. Q. 7, p. 65. Q. 8, p. 68. Q. 10, p. 78. III.—Q. 2, p. 98. Q. 5, 119. Q. 6, p. 139. Q. 10, p. 170. Q. 31, p. 281. Q. 37, p. 313. Q. 38, p. 320. Q. 39, p. 328. Q. 42, p. 350. Q. 44, p. 356.
Colonel F. Haig, R.E.	Chief Engineer, Irrigation Branch, P.W. Department.	- - - -	IV.—Q. 1, p. 362. Q. 2, p. 366. Q. 3, p. 369. Q. 4, p. 375. Q. 7, p. 386. Q. 8, p. 388. Q. 9, p. 391. Q. 10, p. 394. Q. 13, p. 412. Q. 14, p. 423. Q. 15, p. 427. Q. 16, p. 429. Q. 17, p. 432. Q. 20, p. 442. Q. 21 and 22, p. 446. Q. 23, p. 451. Q. 24, p. 456. Q. 25, p. 461. Q. 26, p. 465. Q. 30, p. 473. Q. 31, p. 475.

Name.	Office.	Experience.	——
BENGAL—*continued.*			
Babu Hari Mohan Chandra	Deputy Magistrate and Deputy Collector, Dinagepore.	- - - -	II.—Q. 5, p. 36. Q. 7, p. 65. Q. 9, p. 74. III.—Q. 5, p. 121. Q. 6, p. 142. Q. 22, p. 224. Q. 37, p. 314.
Babu Harish Chandra Roy	Superintendent of Estates of Moharanee Surnomoye, Rungpore.	- - - -	II.—Q. 10, p. 79.
Mr. E. R. Henry, C.S.	Assistant Commissioner, Rajmahal.	Bengal (Durbhunga), 1874.	II.—Q. 2, p. 14. III.—Q. 3, p. 107. Q. 5, p. 121. Q. 6, p. 142. Q. 22, p. 224. Q. 37, p.
Mr. G. J. S. Hodgkinson, C.S.	Officiating Magistrate and Collector of Sarun.	Bengal, 1866 and 1874	II.—Q. 1, p. 6. Q. 2, p. 14. Q. 5, p. 32. Q. 6, p. 50. Q. 7, p. 64. Q. 9, p. 73. Q. 10, p. 78. Q. 12, p. 85. III.—Q. 5, p. 119. Q. 25, p. 240. Q. 30, p. 276. Q. 33, p. 289. Q. 34, p. 294. Q. 39, p. 328. Q. 42, p. 349. Q. 44, p. 356.
Mr. A. J. Hughes, C.E.	Executive Engineer, Irrigation Branch.	Madras, 1877–78	III.—Q. 5, p. 120. Q. 8, p. 141.
Moonshee Ishri Pershad Rai Bahadur.	Deputy Collector, Mozufferpore.	Bengal, 1874	III.—Q. 5, p. 119. Q. 6, p. 139.
Mr. T. M. Kirkwood, C.S.	Joint Magistrate, Moorshedabad.	Orissa, 1866, Behar, 1874–75.	II.—Q. 1, p. 7. Q, 2, p. 15. Q. 3, p. 21 Q. 5, p. 35. Q. 6, p. 51. Q. 7, p. 65. Q. 8, p. 68. Q. 9, p. 74. Q. 10, p. 78. Q. 11, p. 81. III.—Q. 2, p. 98. Q. 3, p. 107. Q. 4, p. 112. Q. 5, p. 119. Q. 6, p. 140. Q. 13, p. 189. Q. 14, p. 193. Q. 15, p. 196. Q. 16, p. 200. Q. 17, p. 204. Q. 18, p. 207. Q. 23, p. 232. Q. 24, p. 237. Q. 25, p. 241. Q. 26, p. 247. Q. 27, p. 262. Q. 29, p. 274. Q. 30, p. 277. Q. 32, p. 286. Q. 33, p. 290. Q. 36, p. 305. Q. 38, p. 321. Q. 39, p. 329. Q. 41, p. 347. Q. 43, p. 353. Q, 44, p. 356.
Mr. H. M. Kisch, C.S.	Officiating under Secretary to Government of Bengal.	Behar, 1874. Madras (Bellary) 1877–78.	III.—Q. 5, p. 120. Q. 6, p. 141. Q. 10, p. 171. Q. 11, p. 178. Q. 31, p. 281. Q. 33, p. 290.
Mr. E. E. Lowis, C.S.	Commissioner	Bengal (Dinajpur), 1873–74.	III.—Q. 6, p. 142. Q. 11, p. 178. Q. 34, p. 295. Q. 39, p. 330.
Mr. A. P. MacDonnell, C.S.	Officiating Magistrate and Deputy Collector.	- - - -	III.—Q. 23, p. 233.
Mr. A. Mackie, C.S.	Joint Magistrate, Backergunge.	Madras (Nellore), 1877–78.	II.—Q. 2, p. 14. Q. 6, p. 51.
Mr. C. F. Magrath, C.S.	Officiating Collector of Monghyr.	Bengal, 1873–74	II.—Q. 2, p. 14. Q. 3, p. 21. Q. 4, p. 24. Q. 5, p. 32. Q. 6, p. 49. Q. 7, p. 64. Q. 8, p. 68. Q. 9, p. 73. Q. 12, p. 84. Q. 13, p. 88. III.—Q. 2, p. 97. Q. 4, p. 112. Q. 5, p. 119. Q. 6, p. 138. Q. 7, p. 157. Q. 10, p. 170. Q. 14, p. 192. Q. 16, p. 200. Q. 17, p. 203. Q. 18, p. 207. Q. 19, p. 212, Q, 22, p. 224. Q. 33, p. 290. Q. 34, p. 295. Q. 39, p. 330. Q. 42, p. 350.
Mr. C. R. Marindin, C.S.	Assistant Magistrate and Collector, Shahabad.	- - - -	II.—Q. 4, p. 24. III.—Q. 24, p. 237, Q. 25, p. 241. Q. 35, p. 300. Q. 38, p. 320. Q. 40, p. 339. Q. 43, p. 353.
Captain J. May	Executive Engineer	Bengal, 1873–74	III.—Q. 5, p. 119. Q. 10, p. 170. Q. 11, p. 178. Q. 20, p. 217. Q. 21, p. 221.
Mr. C. T. Metcalfe, C.S., C.S.I.	Magistrate and Collector, Durbhunga.	- - - -	II.—Q. 1, p. 6. Q. 2, p. 15. Q. 4, p. 24. Q. 5, p. 35. Q. 9, p. 74. III.—Q. 4, p. 112, Q. 5, p. 119. Q. 6, p. 139. Q. 17, p. 203. Q. 19, p. 212. Q. 21, p. 221. Q. 23, p. 231. Q. 33, p. 289 Q. 35, p. 300. Q. 38, p. 321. Q. 43, p. 353.
Mr. C. J. O'Donnell, C.S.	Sub-Divisional Officer, Sarun.	Behar, 1874	II.—Q. 5, p. 33. III.—Q. 2, p. 97.
Babu Ramani Mohan Chandari, Rai Bahadur.	Zemindar, Rungpore	Bengal, 1874	II.—Q. 4, p. 24. Q. 9, p. 74.
Mr. G, Taynbee, C.S.	Officiating Collector of Patna.	Orissa, 1867–68	II.—Q. 5, p. 32. Q. 6, p. 50. Q. 7, p. 65. Q. 9, p. 73. Q. 10, p. 78. III.—Q. 24, p. 237. Q. 25, p. 240. Q. 29, p. 274. Q. 30, p. 277. Q. 31, p. 281. Q. 32, p. 286. Q. 33, p. 289. Q. 35, p. 300. Q. 37. p. 313. Q. 38, p. 320. Q. 40, p. 339. Q. 44, p. 356.
Mr. Whinfield, C.S.	Magistrate and Collector, Burdwan.	Bengal, 1874	III.—Q. 34, p. 296. Q. 39, p. 330.
Mr. C. F. Worsley, C.S.	Collector of Mozufferpore	Behar, 1873–74	II.—Q. 1, p. 5. Q. 2, p. 14. Q. 4, p. 24. Q. 5, p. 31. Q. 6, p. 49. Q. 8, p. 68. Q. 12, p. 84. Q. 13, p. 88. III.—Q. 3, p. 107. Q. 4, p. 112. Q. 17, p. 203. Q. 34, p. 294. Q. 38, p. 320. Q. 39, p. 328. Q. 40, p. 337. Q. 42, p. 349. Q. 44, p. 356.

Name.	Office.	Experience.	—
		CENTRAL PROVINCES.	
Mr. G. J. Nicholls, C.S.	Assistant Commissioner	Central Provinces, 1868–69. Bengal, 1874–75.	II.—Q 2, p. 15. III.—Q. 4, p. 112. Q. 6, p. 142. Q. 17, p. 205. Q. 22, p. 225. Q. 25, p. 242. Q. 33, p. 291. Q. 35, p. 301. Q. 44, p. 357.
		BOMBAY.	
Colonel W. C. Anderson, Bo. S.C.	Commissioner of Survey	- - - -	II.—Q. 4, p. 24. Q. 5, p. 37. Q. 7, p. 66. III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 5, p. 122. Q. 6, p. 145. Q. 7, p. 159. Q. 8, p. 166. Q. 9, p. 167. Q. 11, p. 186. Q. 13, p. 190. Q. 14, p. 194. Q. 15, p. 198. Q. 18, p. 208. Q. 19, p. 213. Q. 21, p. 222. Q, 22, p, 225. Q. 23, p. 235. Q. 25, p. 242. Q. 27, p. 267. Q. 31, p. 282.
Mr. Appajee Raojee	Mamlutdar of Pandharpur	- - -	III.—Q. 5, p. 124.
Mr. L. Ashburner, C.S., C.S.I.	Member of Council	- - - -	III.—Q. 31, p. 283.
Mr. T. Bosanquet, C.S.	Collector, Belgaum	- - - -	II.—Q. 3, p. 22. Q. 8, p. 69. Q. 9, p. 75, Q. 10, p. 79. Q. 11, p. 81. Q. 12, p. 85. Q. 13, p. 89. III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 5, p. 123. Q. 6, p. 146. Q. 7, p. 159. Q. 8, p. 166. Q. 9, p. 167. Q. 14, p. 194. Q. 18, p. 209. Q. 19, p. 214. Q. 22, p. 225. Q. 31, p. 282. Q. 32, p. 287.
Mr. C. T. Burke	Executive Engineer	- - - -	III.—Q. 10, p. 172.
Mr. R. E. Candy, C.S.	Assistant Collector of Ahmednagar.	- - - -	III.—Q. 5, p. 124. Q. 6, p. 149. Q. 11, p. 179.
Mr. Charles, C.S.	Assistant Collector, Dharwar.	- - - -	II.—Q. 1, p. 7. Q. 2, p. 16. Q. 6, p. 53. Q. 7, p. 65. Q. 8, p. 69. Q. 9, p. 75. Q. 10, p. 79. Q. 13, p. 88. III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 5, p. 122. Q. 6, p. 144. Q. 9, p. 167. Q. 13, p. 190. Q. 15, p. 197. Q. 19, p. 213. Q. 20, p. 218. Q. 22, p. 225. Q. 25, p. 241. Q. 39, p. 332.
Mr. W. Clerke	Executive Engineer for Irrigation.	- - - -	III.—Q. 6, p. 151. Q. 11, p. 180.
Mr. H. Erskine, C.S.	Commissioner, Northern Division.	- - - -	IV.—Q. 24, p. 457. Q. 25, p. 461.
The Rev. S. P. Fairbank	American Mission, Ahmednagar.	- - - -	III.—Q. 6, p. 150.
Mr. A. R. Fforde	Assistant Superintendent, Revenue Survey.	- - - -	III.—Q. 6, p. 150.
Mr. J. Gibbs, C.S.I.	Member of Council	- - - -	III.—Q. 2, p. 103. Q. 36, p. 306.
Mr. Hamilton, C.S.	Assistant Collector, Ahmednagar.	- - - -	II.—Q. 1, p. 8. Q. 2, p. 16. Q. 3, p. 22. Q. 9, p. 75. Q. 11, p. 81. III.—Q. 2, p. 103. Q. 4, p. 113. Q. 6, p. 144. Q. 7, p. 158. Q. 9, p. 167. Q. 10, p. 172. Q. 11, p. 186. Q. 13, p. 190, Q. 18, p. 208. Q. 19, p. 213. Q. 22, p. 225. Q. 44, p. 358.
The Rev. C. Harding	Congregational American Mission.	- - - -	III.—Q. 5, p. 124. Q. 6, p. 149. Q. 8, p. 166.
Mr. I. H. E. M. Hart, M.I.C.E.	Acting Chief Engineer for Irrigation.	- - - -	II.—Q. 6. p. 53. III.—Q. 2, p. 102. Q. 5, p. 121. Q. 7, p. 157. Q. 8, p. 165. Q. 9, p. 167. Q. 10, p. 171. Q. 11, p. 179. Q. 12, p. 186. Q. 20, p. 218. Q. 21, p. 221. IV.—Q. 2, p. 366. Q. 3, p. 370. Q. 4, p. 376.
Surgeon Major Hewlett, C.I.E.	Sanitary Commissioner	- - - -	II.—Q. 3, p. 21. Q. 4, p. 24. Q. 5, p. 36. Q. 6, p. 52. Q. 7, p. 65. Q. 8, p. 69. III.—Q. 2, p. 102. Q. 3, p. 108. Q. 4, p. 112. Q. 6, p. 143. Q. 9, p. 167. Q. 10, p. 171. Q. 12, p. 185. Q. 13, p. 190. Q. 14, p. 193. Q. 15, p. 197. Q. 23, p. 234. Q. 24, p. 237. Q. 25, p. 241. Q. 26, p. 248. Q. 27, p. 266. Q. 29, p. 275. Q. 31, p. 282. Q. 36, p. 305. Q. 38, p. 321. Q. 40, p. 340.
Mr. W. C. Hughes	Assistant Chief Engineer for Irrigation.	- - - -	IV.—Q. 1, p. 363. Q. 8, p. 388. Q. 12, p. 407. Q. 13, p. 413. Q. 14, p. 423. Q. 16, p. 429. Q. 19, p. 439. Q. 20, p. 442. Q. 21 and 22, p. 446. Q. 23, p. 452. Q. 24, p. 458. Q. 25, p. 461. Q. 26, p. 465. Q. 29, p. 473. Q. 31, p. 475.
Colonel Jenkin Jones	Superintending Engineer, Central Division.	- - - -	II.—Q. 6, p. 53. III.—Q. 4, p. 112. Q. 5, p. 121. Q. 6, p. 143. Q. 7, p. 157. Q. 8, p. 165. Q. 9, p. 167. Q. 10, p. 171. Q. 11, p. 186. Q. 17, p. 204. Q. 18, p. 208.

BRANCH OF THE ASIATIC SOCIE

Name.	Office.	Experience.	—
		Bombay—*continued.*	
Mr. A. Keyser, C.S. -	Assistant Collector, Poona	- - - -	III.—Q. 3, p. 109. Q. 4, p. 113. Q. 7, p. 159. Q. 31, p. 282.
Mr. J. G. Moore, C.S. -	Collector, Satara - -	- - - -	II.—Q. 1, p. 8. Q. 2, p. 16. Q. 4, p. 24. Q. 5, p. 37. Q. 6, p. 54. Q. 9, p. 75. Q. 10, p. 79. Q. 11, p. 82. Q. 12, p. 86. Q. 13, p. 89. III.—Q. 2, p. 103. Q. 4, p. 113. Q. 5, p. 122. Q. 6, p. 144. Q. 7, p. 158. Q. 8, p. 166. Q. 9, p. 167. Q. 11, p. 186. Q. 14, p. 194. Q. 15, p. 198. Q. 18, p. 208. Q. 19, p. 213. Q. 20, p. 218. Q. 21, p. 222. Q. 31, p. 282. Q. 38, p. 323. Q. 39, p. 332. Q. 40, p. 341. Q. 41, p. 347. Q. 44, p. 358. IV.—Q. 11, p. 398.
Mr. G. Norman, C.S. -	Collector, Poona - -	- - - -	II.—Q. 1, p. 8. Q. 2, p. 16. Q. 3, p. 21. Q. 6, p. 54. Q. 7, p. 66. Q. 8, p. 69. Q. 9, p. 75. Q. 10, p. 79. Q. 11, p. 81. Q. 12, p. 85. Q. 13, p. 89. III.—Q. 2, p. 102. Q. 3, p. 108. Q. 4, p. 112. Q. 5, p. 121. Q. 7, p. 158. Q. 8, p. 165. Q. 9, p. 167. Q. 11, p. 179. Q. 13, p. 190. Q. 14, p. 193. Q. 15, p. 197. Q. 16, p. 201. Q. 18, p. 208. Q. 19, p. 212. Q. 20, p. 218. Q. 21, p. 221. Q. 22, p. 225. Q. 23, p. 234. Q. 24, p. 237. Q. 29, p. 275. Q. 32, p. 287. Q. 33, p. 291. Q. 35, p. 301. Q. 36, p. 305, Q. 37, p. 314. Q. 38, p. 322. Q. 40, p. 340. Q. 43, p. 354.
Mr. E. H. Percival, C.S. -	Collector, Sholapur -	- - - -	II.—Q. 6, p. 53. Q. 9, p. 75. III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 6, p. 144. Q. 7, p. 158. Q. 9, p. 167. Q. 13, p. 190. Q. 14, p. 194. Q. 15, p. 198. Q. 18, p. 208. Q. 19, p. 213. Q. 20, p. 218. Q. 32, p. 287. Q. 33, p. 291. Q. 35, p. 301. Q. 40, p. 341. Q. 45, p. 359.
Mr. W. H. Propert, C.S. -	Collector, Khandesh -	- - - -	II.—Q. 1, p. 8. Q. 2, p. 16. Q. 3, p. 21. Q. 4, p. 24. Q. 5, p. 36. Q. 6, p. 54. Q. 9, p. 75. Q. 10, p. 79. Q. 11, p. 81. Q. 12, p. 85. Q. 13, p. 88. III.—Q. 2, p. 102. Q. 3, p. 108. Q. 4, p. 112. Q. 5, p. 121. Q. 6, p. 144. Q. 7, p. 158. Q. 8, p. 165. Q. 9, p. 167. Q. 10, p. 171. Q. 13, p. 190. Q. 14, p. 193. Q. 15, p. 197. Q. 20, p. 218. Q. 21, p. 221. Q. 22, p. 225. Q. 34, p. 296. Q. 39, p. 331. Q. 44, p. 358. IV.—Q. 6, p. 379. Q. 11, p. 398. Q. 12, p. 407. Q. 13, p. 414. Q. 15, p. 427. Q. 17, p. 432. Q. 19, p. 439. Q. 21 and 22, p. 447. Q. 24, p. 458. Q. 25, p. 462. Q. 26, p. 465.
Mr. E. P. Robertson, C.S.	Commissioner, Central Division.	- - - -	II.—Q. 1, p. 8. Q. 2, p. 16. Q. 4, p. 24. Q. 5, p. 37. Q. 6, p. 54. Q. 7, p. 66. Q. 8, p. 69. Q. 9, p. 75. Q. 10, p. 79. Q. 12, p. 86. Q. 13, p. 89. III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 5, p. 122. Q. 6, p. 145. Q. 7, p. 159. Q. 8, p. 166. Q. 9, p. 167. Q. 11, p. 179. Q. 12, p. 187. Q. 13, p. 190. Q. 14, p. 194. Q. 15, p. 198. Q. 16, p. 201. Q. 18, p. 209. Q. 19, p. 213. Q. 20, p. 219. Q. 22, p. 225.
Mr. W. Ramsay, C.S. -	Collector, Nasik - -	- - - -	II.—Q. 2, p. 16. Q. 7, p. 65. Q. 11, p. 81. Q. 12, p. 85. III.—Q. 35, p. 301. Q. 37, p. 315. Q. 38, p. 323. Q. 40, p. 342. IV.– Q. 25, p. 462. Q. 29; p. 473.
Mr. A. H. Spry, C.S. -	Collector, Kaladgi -	- - - -	II.—Q. 1, p. 7. Q. 2, p. 16. Q. 3, p. 21. Q. 4, p. 24. Q. 5, p. 36 and 37. Q. 6, p. 53. Q. 7, p. 65. Q. 8, p. 69. Q. 9, p. 75. Q. 10, p. 79. Q. 11, p. 81. Q. 12, p. 85. Q. 13, p. 88. III.—Q. 2, p. 102. Q. 3, p. 108. Q. 4, p. 112. Q. 5, p. 122. Q. 6, p. 144. Q. 7, p. 158. Q. 8, p. 165. Q. 9, p. 167. Q. 10, p. 172. Q. 11, p. 179. Q. 12, p. 186. Q. 13, p. 190. Q. 14, p. 193. Q. 15, p. 197. Q. 16, p. 201. Q. 17, p. 205. Q. 18, p. 208. Q. 19, p. 212. Q. 20, p. 218. Q. 21, p. 222. Q. 22, p. 225, Q. 23, p. 234. Q. 24, p. 238.

BOMBAY—*continued.*

Name.	Office.	Experience.	—
Mr. A. H. Spry, C.S.—*cont.*	Collector, Kaladgi	- - - -	Q. 25, p. 241. Q. 27, p. 266. Q. 28, p. 273. Q. 29, p. 275. Q. 31, p. 282. Q. 32, p. 287. Q. 33, p. 291. Q. 34, p. 297. Q. 35, p. 301. Q. 36, p. 305. Q. 37, p. 314. Q. 38, p. 322. Q. 39, p. 331. Q. 40, p. 341. Q. 41, p. 347. Q. 42, p. 350. Q. 43, p. 354. Q. 45, p. 359.
Mr. W. P. Symonds	Assistant Collector, Poona.	- - - -	III.—Q. 24, p. 238. Q. 31, p. 282.
Sir R. Temple, G.C.S.I.	Lieutenant Governor	- - - -	IV.—Q. 1, p. 363.
Lieutenant R. de Villamil, R.E.	Assistant Engineer	- - -	III.—Q. 2, p. 103. Q. 3, p. 108. Q. 4, p. 113. Q. 6, p. 149. Q. 7, p. 159.
Mr. J. E. Whiting	Executive Engineer, Poona.	- - - -	III.—Q. 5, p. 124. Q. 11, p. 180. Q. 20, p. 219.
Major-General St. Clair Wilkins, R.E.	Superintending Engineer, Southern Division.	- - - -	II.—Q. 7, p. 65. III.—Q. 2, p. 102. Q. 3, p. 108. Q. 5, p. 121. Q. 6, p. 144. Q. 7, p. 157. Q. 8, p. 165. Q. 9, p. 167. Q. 10, p. 171. Q. 11, p. 179. Q. 12, p. 186. Q. 13, p. 190. Q. 14, p. 193. Q. 15, p. 197. Q. 16, p. 201. Q. 17, p. 204. Q. 18, p. 208. Q. 19, p. 212. Q. 20, p. 218. Q. 21, p. 221. Q. 22, p. 225. Q. 34, p. 296. Q. 41, p. 347. Q. 42, p. 350. IV.—Q. 2, p. 366. Q. 3, p. 370.
Mr. A. Wingate, C.S.	Assistant Secretary to Famine Commission.	- - - -	II.—Q. 6, p. 55. III.—Q. 5, p. 124. Q. 6, p. 151. Q. 31, p. 282. Q. 35, p. 301.

MADRAS.

Name.	Office.	Experience.	—
Abdul Karlem Khan	Sub-Divisional Office, Public Works Department, North Arcot.	- - - -	III.—Q. 5, p. 128.
Mr. W. Austin	Acting Sub-Collector, North Arcot.	- - - -	II.—Q. 9, p. 76. Q. 10, p. 79. Q. 12, p. 86. III.—Q. 2, p. 105. Q. 4, p. 114. Q. 31, p. 284. Q. 38, p. 325. Q. 43, p. 354.
Captain A. Awdry, R.E.	Executive Engineer, Salem.	- - - -	III.—Q. 4, p. 115. Q. 7, p. 163. Q. 10, p. 174. Q. 11, p. 182. Q. 20, p. 220. Q. 21, p. 222. Q. 25, p. 243. Q. 41, p. 348. Q. 42, p. 352. IV.—Q. 5, p. 378. Q. 6, p. 384.
Major C. D. Baynes, M.S.C.	Government Agent, Chepauk.	Madras (Salem), 1877–78	II.—Q. 2, p. 18. Q. 6, p. 57. Q 10, p. 79. III.—Q. 7, p. 161. Q. 12, p. 187. Q. 13, p. 191. Q. 14, p. 194. Q. 16, p. 201. Q. 17, p. 205. Q. 18, p. 209. Q. 19, p. 215. Q. 25, p. 243. Q. 26, p. 250. Q. 27, p. 268. Q. 29, p. 275. Q. 33 p. 292.
Captain R. R. E. Brockman, R.E.	Executive Engineer, Tanjore.	- - - -	IV.—Q. 3, p. 374. Q. 18, p. 434.
The Right Reverend Bishop Caldwell.	- - - -	- - - -	III.—Q. 31, p. 284.
Major S. C. Clarke, R.E.	Executive Engineer, Buckingham Canal Works.	- - - -	III.—Q. 6, p. 154.
Mr. J. H. Cook	Special Assistant	Madras (Coimbatore), 1877–78.	II.—Q. 1, p. 10. Q. 8, p. 70. Q. 39, p. 335.
Mr. W. Cotton	Executive Engineer	- - - -	III.—Q. 5, p. 127.
Mr. C. S. Crole, C.S.	Acting Collector of Kurnool.	Madras (Nellore), 1877–78	III.—Q. 2, p. 105. Q. 3, p. 109. Q. 4, p. 114. Q. 5, p. 126. Q. 7, p. 161. Q. 12, p. 187. Q. 24, p. 238. Q. 25, p. 242. Q. 26, p. 249. Q. 29, p. 275. Q. 37, p. 316. Q. 43, p. 354. Q. 45, p. 360. IV.—Q. 13, p. 416. Q. 15, p. 428. Q. 26, p. 468.
Mr. G. W. Fawcett	Acting Head Assistant Collector of Kurnool.	- - - -	III.—Q. 3, p. 110. Q. 4, p. 115. Q. 5, p. 126. Q. 7, p. 160. Q. 39, p. 334.
Colonel E. A. Foord, R.E.	Chief Engineer, Public Works Department.	- - - -	IV.—Q. 3, p. 373. Q. 4, p. 376. Q. 5, p. 378. Q. 7, p. 386. Q. 8, p. 389. Q. 9, p. 392. Q. 11, p. 398.
Mr. W. S. Foster, C.S.	Collector of Godavari District.	- - - -	IV.—Q. 13, p. 418. Q. 14, p. 425. Q. 15, p. 428. Q. 17, p. 433. Q. 23, p. 454. Q. 27, p. 470.
Mr. Gillon	- - - -	- - - -	III.—Q. 22, p. 226. Q. 38, p. 325.
Surgeon H. A. C. Gray, M.B.	- - - -	Madras (Chingleput and Kurnool), 1877–78.	III.—Q. 6, p. 154. Q. 23, p. 235. Q. 26, p. 249. Q. 27, p. 267.
Mr. J. Grose	Collector of Nellore	- - - -	II.—Q. 8, p. 69. Q. 9, p. 76. Q. 10, p. 79. Q. 11, p. 82. Q. 12, p. 86. III.—Q. 2, p. 104. Q. 3, p. 109. Q. 4, p. 114. Q. 5, p. 126. Q. 9, p. 168. Q. 10, p. 173. Q. 12, p. 187. Q. 13, p. 191. Q. 19, p. 215. Q. 20, p. 219. Q. 26, p. 249. Q. 38, p. 324. Q. 39, p. 333. Q. 40, p. 345. Q. 41, p. 348.

Name.	Office.	Experience.	——
MADRAS—*continued.*			
Honourable G. N. Gujpatirao.	- - - -	Madras (Vizagapatam), 1877–78.	III.—Q. 18, p. 210.
Lieutenant-Colonel J. O. Hasted, R.E.	Superintending Engineer, Kistna.	- - - -	II.—Q. 1, p. 10. Q. 7, p. 66. III.—Q. 5, p. 127. Q. 12, p. 188. Q. 20, p. 220.
Mr. Hayes -	- - - -	Madras (Nellore, East Coast Canal), 1876–78.	III.—Q. 5, p. 128. Q. 11, p. 182.
Lieutenant C. B. Henderson, R.E.	Assistant Engineer, Public Works Department.	- - - -	III.—Q. 5, p. 128. Q. 35, p. 303.
Mr. D. K. Homan -	Famine Relief Officer, Coimbatore District.	Madras (Coimbatore), 1877–78.	III.—Q. 3, p. 110.
Mr. J. G. Horsfall - -	Acting Collector, Kistna -	- - - -	II.—Q. 1, p. 9. Q. 2, p. 17. Q. 4, p. 21. Q. 5, p. 40. Q. 6, p. 56. Q. 9, p. 76. Q. 11, p. 82. Q. 12, p. 86. Q. 13, p. 89. III.—Q. 4, p. 113. Q. 7, p. 160. Q. 13, p. 191. Q. 18, p. 209. Q. 31, p. 283. Q. 32, p. 287. Q. 36, p. 306. Q. 37, p. 317. Q. 39, p. 333. Q. 41, p. 348. Q. 42, p. 351. Q. 45, p. 360.
Mr. T. M. Horsfall -	Assistant Collector of Madura.	Madras (Madura), 1876–77.	II.—Q. 8, p. 69.
Lieutenant-Colonel J. Hunter, R.E.	Executive Engineer, Bellary.	- - - -	IV.—Q. 3, p. 374. Q. 6, p. 384. Q. 8, p. 390. Q. 9, p. 392. Q. 27, p. 470.
Mr. Hurry Row - -	- - - -	- - - -	III.—Q. 6, p. 154. Q. 33, p. 292. Q. 39, p. 335.
Mr. A. M. Jones - -	Deputy Collector and Magistrate, Chingleput.	- - - -	II.—Q. 10, p. 79. III.—Q. 2, p. 105. Q. 3, p. 110. Q. 5, p. 126. Q. 10, p. 173.
Mr. Knox - -	- - - -	- - - -	II.—Q. 4, p. 24. Q. 8, p, 69. III.—Q. 2, p. 105. Q. 3, p. 110. Q. 4, p. 115. Q. 9, p. 168. Q. 15, p. 199.
Surgeon John Lancaster -	Acting Zillah Surgeon of Salem.	- - - -	III.—Q. 28, p. 273.
Mr. J. Lee Warner, C.S. -	Principal Assistant Collector, Vizagapatam.	Madras (Ramnad and Vizagapatam), 1877–78.	II.—Q. 8, p. 69. Q. 10, p. 79. Q. 12, p. 86. III.—Q. 4, p. 115. Q. 38, p. 325.
Mr. C. T. Longley, C.S. -	Collector of Salem -	- - - -	II.—Q. 1, p. 9. Q. 2, p. 18. Q. 5, p. 38. III.—Q. 2, p. 104. Q. 3, p. 109. Q. 6, p, 151. Q. 7, p. 160. Q. 10, p. 173. Q. 11, p. 180. Q. 12, p. 187. Q. 13, p. 191. Q. 14, p. 194. Q. 15, p. 198. Q. 18, p. 209. Q. 19, p. 214. Q. 20, p. 219. Q. 21, p. 222. Q. 22, p. 226. Q. 24, p. 238. Q. 25, p. 242. Q. 31, p. 283. Q. 33, p. 291. Q. 35, p. 303. Q. 36, p, 306. Q. 37, p. 315. Q. 38. p. 323. Q. 39, p. 332. Q. 40, p. 342. Q. 41, p. 348. Q. 42, p. 351. Q. 43, p. 354. Q. 45, p. 359. IV.—Q. 12, p. 408. Q. 13, p. 415. Q. 19, p. 440. Q. 25, p. 463.
Mr. J. Macartney - -	Agent to Raja of Sundoor	- - - -	II.—Q. 7, p. 66. Q. 8, p. 70. III.—Q. 6, p. 154.
Surgeon McNally, M.D. -	Sanitary Inspector - -	Madras (Cuddapa), 1877.	III.—Q. 12, p. 188. Q. 14, p. 195. Q. 26, p. 250.
Mr. G. McWatters - -	Sub-Collector of Coimbatore.	- - - -	IV.—Q. 6, p. 383. Q. 12, p. 408. Q. 13, p. 418.
Captain G. Maitland -	Executive Engineer -	- - - -	III.—Q. 6, p. 154.
Mr. C. W. W. Martin, C.S.	Acting Sub-Collector of Madura.	- - - -	II.—Q. 1, p. 9. Q. 4, p. 24. Q. 5, p. 40. Q. 7, p. 66. Q. 10, p. 79. III.—Q. 2, p. 104, 105. Q. 3, p. 109. Q. 4, p. 114. Q. 37, p. 317. Q. 38, p. 325. Q. 39, p. 333.
Major H. R. Mead, R.E. -	Superintending Engineer	- - - -	II.—Q. 7, p. 66. III.—Q. 5, p. 127. Q. 11, p. 182. IV.—Q. 3, p. 373. Q. 4, p. 376. Q. 5, p. 378. Q. 6, p. 384. Q. 7, p. 386. Q. 8, p. 390. Q. 9, p. 392. Q. 11, p. 400.
Major R. Montgomerie, R.E.	Acting Deputy Chief Engineer for Irrigation.	- - - -	IV.—Q. 2, p. 366. Q. 3, p. 372. Q. 4, p. 376. Q. 5, p. 378. Q. 6, p. 381. Q. 7, p. 386. Q. 8, p, 389. Q. 10, p. 395. Q. 11, p. 398. Q. 14, p. 425. Q. 15, p. 427. Q. 21 and 22, p. 448. Q. 27, p. 470.
Mr. Lewis Moore, C.S. -	Acting Head Assistant Collector, Trichinopoly.	Madras (Trichinopoly), 1877.	III.—Q. 39, p. 334.
Captain R. F. Morris, R.E.	Executive Engineer, Trichinopoly Division.	- - - -	III.—Q. 7, p. 163. Q. 10, p. 174. Q. 18, p. 209. Q. 19, p. 216.
Lieutenant-Colonel J. Mullins, R.E.	Chief Engineer for Irrigation.	Madras (Coimbatore), 1877–78.	IV. Q. 1, p. 364. Q. 2, p. 366. Q. 3, p. 472. Q. 4, p. 376. Q. 5, p. 377. Q. 6, p. 381. Q. 7, p. 386. Q. 8, p. 389. Q. 9, p. 391. Q. 10, p. 395. Q. 11, p. 398. Q. 14, p. 424. Q. 15, p. 427. Q. 16, p. 429. Q. 17, p. 433. Q. 18, p. 434. Q. 19, p. 440. Q. 20, p. 442. Q. 21 and 22, p. 447. Q. 23, p. 453. Q. 24, p. 459. Q. 25, p. 463. Q. 26, p. 466. Q. 27, p. 470. Q. 29, p. 473. Q. 30, p. 473. Q. 31, p. 477.

Name.	Office.	Experience.	—
		MADRAS—*continued.*	
The Rev. G. O. Newport -	London Missionary Society.	Travancore, 1869–70. Madras (Salem), 1877–78.	II.—Q. 9, p. 76. III.—Q. 7, p. 164. Q. 33, p. 292.
Mr. K. F. Nordmann -	District Engineer, Kurnool.	- - - -	III.—Q. 6, p. 153.
Mr. W. B. Oldham, C.S. -	Collector and Special Famine Officer, Bellary.	Orissa, 1866–68. Chumparun, 1869. Behar, 1874. Madras, 1876–78.	II.—Q. 7, p. 66. Q. 8, p. 70. III.—Q. 5, p. 126. Q. 6, p. 153. Q. 7, p. 163. Q. 8, p. 166. Q. 10, p. 173. Q. 11, p. 181. Q. 15, p. 199. Q. 17, p. 206. Q. 18, p. 209. Q. 19, p. 215. Q. 21, p. 222. Q. 25, p. 242. Q. 31, p. 284. Q. 32, p. 288. Q. 38, p. 325. Q. 39, p. 335. Q. 41, p. 348. Q. 42, p. 352. Q. 45, p. 361.
Mr. J. O'Shaughnessy -	District Engineer, Nellore.	- - - -	IV.—Q. 1, p. 364. Q. 3, p. 373. Q. 6, p. 384. Q. 7, p. 386. Q. 8, p. 390. Q. 9, p. 392. Q. 10, p. 395. Q. 11, p. 399.
Mr. T. Pattabhiram Pillay	Huzur Sheristadar, Trichinopoly.	- - - -	III.—Q. 32, p. 388.
Mr. J. B. Pennington -	Collector of Tinnevelly -	Madras (Tinnevelly), 1877–78.	II.—Q. 11, p. 82.
Major Pennycuick -	Executive Engineer, Salem.	Madras, 1877 - -	IV.—Q. 5, p. 378. Q. 6, p. 384.
Lieutenant-Colonel H. L. Prendergast, R.E.	Superintending Engineer	Madras, 1877 - -	III.—Q. 2, p. 105. Q. 3, p. 110. Q. 4, p. 115. Q. 5, p. 127. Q. 7, p. 163. Q. 10, p. 173. Q. 11, p. 182. Q. 21, p. 222. IV.—Q. 3, p. 374. Q. 4, p. 376. Q. 5, p. 378. Q. 6, p. 384. Q. 7, p. 386. Q. 8, p. 390. Q. 9, p. 392. Q. 10, p. 395. Q. 11, p. 400.
Mr. J. F. Price, C.S. -	Collector of Chingleput -	- - - -	II.—Q. 1, p. 8. Q. 2, p. 17. Q. 3, p. 22. Q. 5, p. 40. Q. 6, p. 56. Q. 7, p. 66. Q. 12, p. 86. Q. 13, p. 89. III.—Q. 2, p. 104. Q. 3, p. 109. Q. 4, p. 114. Q. 5, p. 125. Q. 6, p. 152. Q. 7, p. 161. Q. 8, p. 166. Q. 9, p. 168. Q. 10, p. 172. Q. 15, p. 198. Q. 18, p. 209. Q. 19, p. 215. Q. 20, p. 219. Q. 21, p. 222. Q. 22, p. 226. Q. 23, p. 235. Q. 24, p. 238. Q. 25, p. 242. Q. 31, p. 283. Q. 32, p. 287. Q. 35, p. 303. Q. 36, p. 306. Q. 38, p. 324. Q. 39, p. 332. Q. 40, p. 343. Q. 41, p. 348. Q. 42, p. 351. Q. 45, p. 360. IV.—Q. 6, p. 381. Q. 11, p. 399. Q. 26, p. 467.
Sir. W. Robinson, K.C.S.I.	Senior Member of Council, Madras.	- - - -	II.—Q. 1, p. 8. Q. 12, p. 86. III.—Q. 2, p. 104. Q. 19, p. 214. Q. 35, p. 302. Q. 36, p. 306. Q. 38, p. 323. Q. 39, p. 332. Q. 40, p. 342. Q. 41, p. 348. Q. 43, p. 354.
Mr. H. T. Ross - -	Assistant Collector, Bellary.	- - - -	III.—Q. 7, p. 161. Q. 11, p. 180. Q. 20, p. 220. Q. 39, p. 334.
Major G. C. Ross, 16th Bengal Cavalry.	Madras (Coimbatore), 1877–78.	- - - -	III.—Q. 3, p. 153. Q. 10, p. 173. Q. 11, p. 181.
Mr. J. W. Rundall, M.I.C.E.	Acting Superintending Engineer.	- - - -	III.—Q. 2, p. 105. Q. 3, p. 110. Q. 5, p. 127. Q. 6, p. 154. Q. 21, p. 222. IV.—Q. 3, p. 374. Q. 10, p. 396.
Mr. A. S. Russell - -	Assistant Engineer -	Madras, (Nellore and Coimbatore), 1876–77	III.—Q. 5, p. 127. Q. 10, p. 174.
Mr. Ruthnasabapathy Pillay.	Assistant Engineer, North Arcot.	- - - -	III.—Q. 4, p. 115. Q. 7, p. 164.
Mr. Seetharamiah - -	- - - -	- - - -	II.—Q. 2, p. 18. Q. 4, p. 25.
Mr. Sewell - -	- - - -	- - - -	II.—Q. 3, p. 22, Q. 6, p. 56. Q. 10, p. 79. Q. 11, p. 82.
Mr. C. W. Simson -	Chairman, Chamber of Commerce, Coconada.	- - - -	IV.—Q. 3, p. 374.
Mr. P. Soobien - -	Deputy Collector -	- - - -	II.—Q. 2, p. 18. Q. 9, p. 76. III.—Q. 32, p. 288. Q. 37, p. 317.
Serjeant C. Stewart -	Supervisor, P. W. Dept. -	- - - -	III.—Q. 6, p. 154.
Mr. H. J. Stokes, C.S. -	Acting Collector of Madura.	- - - -	II.—Q. 11, p. 83. III.—Q. 22, p. 226. Q. 35, p. 303. Q. 37, p. 316.
Mr. H. E. Sullivan, C.S. -	Acting First Member, Board of Revenue, Member of Famine Commission.	- - - -	IV.—Q. 6, p. 379. Q. 12, p. 408. Q. 13, p. 414. Q. 15, p. 427. Q. 18, p. 434, Q. 21 and 22, p. 447. Q. 23, p. 453. Q. 24, p. 458. Q. 25, p. 462. Q. 26, p. 466. Q. 27, p. 470. Q. 28, p. 471.
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CHAPTER II.—REPLIES.

QUESTION 1.—INDICATIONS OF APPROACHING DISTRESS.

How does distress consequent on drought first make itself felt among the people, and how is it first brought to the notice of the district officers? What are the indications by which the district officer would judge whether the distress is due to temporary or local scarcity, or is likely to be the forerunner of very severe general distress ending in famine? What steps should be taken to ensure that such indications are brought to his notice? To what extent does the existing district organization suffice to ensure early and trustworthy reports, and if not sufficient, what other measures are suggested as requisite?

Punjab.—7 officers have answered. The purport is the same as for Bombay. The district organization is considered sufficient by the majority.

North-Western Provinces.—30 officers have answered the question.

The purport of the replies is similar to that of the Bombay answers.

Bengal.—17 officials and others have answered.

The views as to the way in which distress shows itself do not much differ from the foregoing. As to the sufficiency of existing district organization, opinions differ, but in some cases the opinion is very strongly expressed that it is quite insufficient. The police are the agency for supplying information, supplemented by a large non-official class. Agricultural and trade statistics are wanting.

Bombay.—12 officers have answered the question.

The substance of their answers is—

Distress shows itself first by a rise in prices and simultaneous decrease of employment for labour.

It comes to the notice of the district officers by personal observation and from the reports of the village and taluka officers, and returns of prices and rain-fall, and of crime.

The district officer would judge whether the distress is temporary by considering the time of the season at which it begins, the condition of crops in adjoining districts.

He would cause all subordinate officials to travel in their charges, and report periodically, and, if needful, would himself make a tour of observation. The existing district organization is considered sufficient.

Madras.—21 European and 4 Native gentlemen have furnished replies, the general tenor of which is as follows:—

Distress consequent on drought first makes itself felt amongst the poorer classes by the enhancement of prices, the scarcity of drinking water for man and beast, the contraction of the labour market consequent on the suspension of agricultural operations, and a difficulty in negotiating the petty loans which in favourable years the village money-lenders are in the habit of granting on the security of the season's crop.

The district officers are first apprised of the condition of matters by the reports they receive from their subordinates stationed in different parts of the district of the state of the crops and season, by the rain-fall and price returns, and by petitions from the smaller landholders praying for a remission of the Government assessment. It does not, however, follow that because prices have risen, and the labouring classes experience difficulty in finding employment, that anything in the shape of a famine is to be apprehended. In many cases the distress is merely local, and may be traced to the failure of the crops in the vicinity, and will disappear with the next rainy season; but should this prove unpropitious, and inquiries show that the surrounding districts are similarly affected, if prices continue to rise throughout the country, if the markets generally are not so plentifully supplied as usual, if the police returns show an increase in crime, if there are panics in the bazaars leading to the closing of the grain dealers' stores, it will be reasonable to conclude that distress is becoming general, and will be followed by famine more or less intense according to circumstances.

So far as Madras is concerned there is a general unanimity of opinion that the existing district organisation is sufficient to ensure trustworthy reports of imminent distress and possible famine.

Central Provinces.—Mr. G. J. Nicholls, C.S., who has been employed in various capacities in the Central Provinces since 1865, and Surgeon-Major J. F. Barter, the Sanitary Commissioner, whose services in the Provinces extend over a period of 14 years, were selected by the Chief Commissioner to reply to the questions circulated by the Famine Commission.

The replies to Chap. II. are from the pen of the former officer.

Mysore.—9 European officers have replied to this chapter of questions. The summary made of the Madras answers is applicable to these replies.

The evidence of Colonel Sankey, Major Moncrieff, Colonel Johnson, and Mr. Ricketts has been selected for publication.

PUNJAB.

CH. II. QN.
PUNJAB.

Captain Wood.—I believe that the official reports of the present *tahsil* agency, together with intercourse with the leading men of the sub-division, were sufficient to furnish me with reliable information with regard to the state of the sub-division.

Lieutenant-Colonel Parsons.—(*a.*) Distress consequent on drought first makes itself felt among the people in increase of price of necessaries of life; the poorer classes, village menials and labourers being unable to provide sufficient food for themselves and families, itinerate in quest of charity. In Gujrat the distress has been chiefly among immigrants from the famine-stricken Jummoo territory, and its indications, the daily arrival of paupers seeking employment and charities at the larger towns and villages, principally in the Gujrat *tahsil.* (*b.*) Earliest indications are afforded to the district officer by reports of *tahsil* and police officials.

(*c.*) In this province all instances of distress are owing to temporary or local scarcity, the probable extent of distress being estimated by severity of the drought, and condition of the people with reference to immediate preceding harvests. (*d.*) The existing district organization has, in the writer's experience, been practically sufficient for obtaining early information in regard to distress, reports being made by *tahsil* and police officials; but it would seem advisable that distinct specific instructions should be circulated for general adoption to secure early reports at sadr head-quarters, and also to Government.

Mr. Roberts.—Distress consequent on drought first makes itself felt by the rise of prices which always takes place in anticipation of the failure of the ensuing harvest, and in this district last year it was first brought to my notice by petitions pouring in from all parts for grants of money for the employment of agricultural labourers and other village servants upon village tanks. This was soon followed by a remarkable increase in offences against property, and by migration from the villages in search of employment, or of pasture for cattle. It is impossible at the beginning of a bad season to judge from the circumstances of any one district whether the famine is likely to be partial or general, as everything depends on the extent of country over which the drought prevails, and on the rainfall of succeeding months, which cannot be estimated beforehand. The failure of one crop, though it will cause a rise of prices, and consequent privation to the poorer classes, will not produce an actual deficiency of food grains; but the failure of two or three harvests in succession, or the total failure of one followed by deficient out-turn in several, will necessitate imports, and absolutely deprive many thousands of the poorer agriculturists, proprietors as well as tenants and labourers, of the means of purchasing, unless they are saved from destitution by timely suspensions or remissions of the land tax. The district officer can best form a forecast of the future by noting the meteorological reports and crop returns of other districts and provinces of India. The *Zaildár* system, introduced with the new settlement, is well adapted for securing the necessary information of the condition of a district, and when it comes into regular working, will, if properly utilized, ensure an early supply of trustworthy information.

Mr. Benton.—From what I have said elsewhere it will appear that I consider something altogether beyond district organization necessary to secure the information requisite for dealing with distress or famine, inasmuch as local distress is nowadays so much influenced by scarcity or plenty elsewhere. To speak, however, of district organization, I think that the utmost attention should be given to securing correct information as to the out-turn of each crop, by determining the exact area under each crop; and the proper average produce to be employed for bringing out the out-turn. This is a laborious work, and the Patwári is the chief agent for performing it. During settlement he has no time or opportunity of attending to it. One half of this district will be seven years under settlement, and the other half may be as long in addition. During all this time this important work must be more or less neglected under present arrangements. I think that provision ought to be made for its performance at all times. Further, distress adds to mortality; and the present mortuary returns, except perhaps for the towns, are so untrustworthy as to be useless except for the sake of making a guess by comparing the untrustworthy returns of one period with those of another. I think in the Punjab the *Chaukídárs'* rules should be altered so as to enable a *Chaukídár* who could read and write to be appointed for the purpose of reporting vital statistics for a circle of villages. This would secure accurate returns at small cost. At present the returns are not submitted through the Deputy Commissioner, but he might obtain perusal of them from the police before they are sent in. A yearly return showing results for each week or month for each locality should be published by the Sanitary Commissioner, to enable comparisons to be made if it were suspected that mortality was due to distress.

NORTH-WESTERN PROVINCES AND OUDH.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. A. Colvin.—By high prices and difficulty of getting food or labour. It is brought to the notice of district officers by their own observation of the changes coming over the people's habits, by petitions addressed to them, by the people asking for employment, and by the reports of their subordinates.

The indications I should look to are the more or less general area of drought, or the severity of drought and the character of the season in neighbouring districts. Information as to rain-fall, area sown, area in which seed is germinating, stocks, and state of imports will give him the information he wants. The existing district organization is good, but statistics as to quantity of out-turn might be improved.

Mr. Sandys.—Distress consequent on droughts makes itself felt, and is brought to notice by the influx of hired labourers into the larger towns, by the state of destitution to which the poorest amongst the weavers and others of the artizan class are reduced in the towns, by the numerous complaints against the grain merchants of refusing to make the customary advances for food, by the increase in the number of cases of thefts and gang robberies of any edible articles, and by the frequent complaint that the export of grain from villages had been opposed by the villagers.

Whether the distress is temporary or is likely to end in a famine depends on what the out-turn of the last crop has been, what the prospects of the ensuing harvest and the state of the stocks are throughout the district, the province, and adjoining provinces.

The district officer's local knowledge as to the out-turn of the last crop and prospects of the next harvest, the weekly weather and rain-fall reports published in the Government Gazette, and the prices current are the best guide the district officer has as to whether the drought will result in distress only, or end in famine. The rain-fall reports might easily, and with advantage, be published up to a much later date than they are at present.

Mr. Kennedy.—The first economic effect of a drought is to restrict the circulation of capital and credit. Among the agricultural community more than three-fourths of the total population is engaged in the actual cultivation of the soil. The principal economic feature in all agricultural communities is the necessity of a large outlay of capital in advance, and the slowness with which it repays itself. All agricultural communities are therefore large borrowers; but while the agriculturists in the more advanced countries of Europe require to borrow capital only for the actual working of their farms, the Indian cultivator needs to borrow for his own subsistence. He thus forestalls yearly the greater part of his crops. Should the prospects of the crops fail, he must fall back on his own resources. The severity of the famine depends so far as the agricultural community are concerned upon the amount of capital which the cultivator has saved, or the amount of credit which he can command, notwithstanding the failure of the year. The proportion which this class bears to the rest of the cultivating population will be the main factor deciding the fate of the district. If the agricultural community as a body can bear the pressure, the district will speedily recover its former prosperity, but if it cannot, the district must become demoralized.

All other classes of rural community depend upon the agricultural class, and although the poverty of these subordinate members of rural society makes distress to be first visibly felt among them, the distress is due to the restriction of the annual credit required by the cultivators. Capital is extremely sensitive of any prospect of disaster, and the system upon which loans are arranged in this district increases the natural restriction of credit at the commencement of a famine. The sums lent by the baniya are from time to time repaid in kind. But the annual settlement of accounts does not take place until an average rate of prices is struck for the whole district. This is done by a meeting of the principal traders, landlords, and cultivators at Baragaon. When the Baragaon *katauti* is struck, the rate for transactions in every other part of the district during the past year becomes immediately known.

This settlement takes place about a month after the monsoon is due, and when the prospects of the young sugar-cane are assured. By this time also the failure or success of the monsoon is certain. The cultivator has already parted with his produce in anticipation of the annual settlement, the baniya has no interest in supporting the cultivator any longer if the speculation appears attended with risk. The first effect therefore of the failure of the monsoon is to withdraw the credit upon which the whole agricultural population subsists.

If we consider that three-fifths of the population depend upon agriculture, that 90 per cent. of this class require to forestall one-half to two-thirds of their annual production, and that the capital invested in household necessaries or luxuries, or in farm stock and implements, becomes utterly unsaleable, it is easy to perceive the calamity which a sudden collapse of credit must create. The agriculturists form two-thirds of the population. The field labourers and the other classes of rural society who depend upon them for employment and subsistence form two-thirds of the remainder. The means of this class are of course smaller than those of the poorest cultivators. The male members of these classes are accustomed to leave home in search of employment. When the rains failed in 1877 and the cultivators were unable to give them employment they usually afforded, a general migration began among the field labourers; this soon extended from individual to families.

This class did not frequent the towns at first, but wandered from village to village. Mendicants and helpless persons also joined in the stampede and were the first to flock to the towns in large numbers. This migration is the first too visible sign that famine has overtaken the country. Two other ordinary effects of famine follow shortly after. The one consists in the general depreciation of every article except food, and the impossibility of finding purchasers for ordinary goods even at the lowest price. I have entered a house of a weaver who had died from starvation and found cloth enough to support him and his family for weeks in ordinary times.

Mr. Leeds.—Distress resulting from drought makes itself felt amongst the people by a rise in prices and a consequent contraction of the demand for labour. It is brought at once to the notice of the district officer not only by the reports of his *tahsildars* and police subordinates, but also by the evidence of the price current, and of his own eyes and ears. It is difficult to specify the indications which would lead a district officer to judge whether the distress were merely temporary, but in practice I think he could scarcely ever be at a loss to decide. He is kept steadily informed of the state of the crops, of prices, and of all other circumstances which affect the condition of the masses in his own district, and has ready means of access to information regarding what is passing elsewhere. The main indication of the extent and severity of distress must always be the price of food grains. When wheat rises from 25 seers, its normal rate to 12 seers for the rupee, and other food grains in proportion, there can be no doubt that very severe distress must be suffered by the labouring classes, whose remuneration at the best of times is not in excess. In the North-Western Provinces the existing district agency appears to me amply sufficient to meet the requirements of the case and to ensure early and sufficiently trustworthy information.

Mr. Cornwall.—In a district like Cawnpore, partly canal-irrigated and partly dry, *i.e.*, practically unirrigable from wells on account of the depth to water, distress first makes itself shown in the dry portion. The reason for this is that in the dry villages the crops, if any were sown, have failed from want of rain, and as the season advances the village *Baniya* plainly perceives that if he allows the cultivators food as usual, upon the understanding that he will be repaid when the crop is cut, he will be the loser. He consequently refuses to sell except for ready money, and thus throws the whole of the tenantry and their dependents, amongst whom I class the petty non-agriculturists, upon the hands of the landlord for support. In some instances the landlord has sufficient resources at his disposal to accept the burden; in others, and especially in *bhaiác-hára* villages, the whole population is thrown upon charity for support.

In the canal-irrigated villages distress does not appear so soon, as there is generally a good area under indigo and sugar-cane, for the former of which a good price is available at an early period of the season, and the latter can be sold as required for fodder of cattle, as was the case with nearly all last year's crop. In these villages there is consequently a certain degree of security for the *Baniya*, and he continues therefore to give assistance so long as that security exists; so that distress is postponed for some time, and may, as was the case last year, not appear at all.

Distress in the villages is very soon brought to the notice of the tahsildar by one of the *tahsíl* establishment, or by the supervisor, *kanúngo* or *patwári*, and through him to the district officer. But the influx of poor people to the sudder station, the unusual number of beggars on the roads, and the increase in petty thefts and burglaries, must also attract early notice.

The nature of the distress and its probable duration depend largely upon the past harvests. To compare this year with last, when the rain failed last year, there was in the early months of June and July no apprehension of scarcity. There had been good harvests, both *kharíf* and *rabi*, and the high prices obtainable for grain of all kinds in consequence of the demand for wheat for export and for other grains for the Madras and Bombay famine districts had enabled the cultivators, or at any rate such portion of them as are not encumbered with debt, to dispose of their produce advantageously. There was therefore considerable purchasing power in the villages, and if more discretion had been used and less grain exported, I think it is highly probable that the distress could have been tided over. The cultivators, moreover, had their seed grain in hand for both *kharíf* and *rabi* harvests. In spite of the failure of the *kharíf* sowings, in some *parganas* almost total, there was little distress except in the dry southern unirrigated *parganas*; and then only in villages where the Baniyas absolutely refused all help, and when the *zemindars* had not the means to assist. This lasted throughout August and September; but with the October rain the Baniyas resumed operations, and distress disappeared to a great extent; and when the December rain fell, and the *rabi* was believed safe, it disappeared entirely. This year the condition of things is very different. Last year's *kharíf* was inappreciable, and the *rabi* was a disappointment. The large area in excess of that ordinarily sown has contributed its quota to the food stock, but the grain of all descriptions is so light and wizened that in actual weight I doubt the crop of wheat and barley being above average, and grain and peas are very bad. In addition to this the failure of the kharíf has left the cultivator without seed, and for the ensuing rabi sowings he will have to obtain seed elsewhere, for none of that grown this year, except perhaps barley, is fit for use as seed grain; and above all this, the rabi has had to bear more than its usual weight, as from it the cultivator has had to pay his full rent, and also the cost of food for his family during the past eight months, both of which would have been ordinarily provided for in a great measure from the kharíf. Now he finds himself with little money and

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no seed, whereas last year he had more money than usual and the full quantity of seed, as well as some grain in store. As last year the distress under the circumstances related was only temporary, so this year, under the vastly altered conditions, there appears, in the event of rain being withheld, every probability of a severe famine. Such comparisons as these seem to force themselves into notice, and require no special steps to bring them forward. The present district staff, both revenue and police, contributes information each in its own sphere, and is quite sufficient to ensure early reports of anything deserving of notice being made. The accuracy and value of these reports must depend upon the reporters. A good tahsíldar's information is invaluable, but there are only a few such in each district. The remainder seem to take no pains or to think what they are writing, and so the result of their reports are sometimes remarkable. As a rule, the best men seem to be those who have gone early in life to active work; but the less active office men, who have worked up step by step, rarely make such good tahsíldars, though there are occasional exceptions.

Mr. Webster.—The increase of (so to speak) non-professional beggars, as it is the first, so it is the most unmistakeable sign of distress. At present—I say " at present," for I discern signs that the exceeding liberality with which Government has relieved the wants of the people at the very first sign of distress of late has tended to induce habits of pauperism, and the people are beginning (only beginning as yet) to take to begging and to clamouring for Government relief under circumstances which formerly would not have induced them to do so; between harvests when work is slack, day labourers, and when trade is bad, weavers and the like, are beginning to take to begging. This is a serious sign, and one that the Government would do well to take heed of. The consequences of pauperizing a population like that of the North-Western Provinces and leading them to rely on Government for their support at the first approach of hard times would be ruinous; and I think our famine policy does tend in some slight degree in that direction in one point; in all others I think it wise and prudent as well as beneficent and generous. The point I refer to is the suggestion (for I believe it is not more at present) that any adult able-bodied male should receive gratuitous relief from the Government because his sense of personal dignity renders him averse to working with his hands to support his life. I consider that if this principle be admitted, and if the State undertake not only to save the lives of those in danger of starvation, but consents also to allow the recipients of its bounty to dictate the terms on which they will accept that bounty, then we have taken the first step, and a very long one it is, towards the demoralization and pauperization of the population. Let this idea that Government will gratuitously support anyone able to work be once confirmed, and every man, woman, and child who does not in ordinary times earn his or her livelihood by manual labour on road or field will find personal dignity in the way of accepting anything but gratuitous relief from the State.

Captain Pitcher.—Distress cannot fail to come under the notice of any intelligent district officer from the outset, in the bare fields, in the unwonted spectacle of whole families on the tramp with want stamped in their faces; in a sudden irruption into the station of begging and starved looking children, sent out to beg by parents who are scarcely yet bold enough to venture on the unaccustomed thing; in the spectacle of men harnessed by the dozen to well ropes in the place of bullocks; by the high prices of grain; by noticing that the streams of the grain traffic are reversed, and that instead of flowing into towns the grain is flowing out; by constant reports from thánahs and tahsíls.

Mr. Lumsden.—The exact shape in which distress consequent on drought first makes itself felt among the people would depend to a considerable extent on the particular season at which it began to be felt; dearth of work for the labouring classes; a steady, if gradual, rise in prices; difficulty on the tenant's part in meeting the landlord's demands for rent, and on the landlord's part in meeting his engagements with Government; a contraction of private charity among the middle and even well-to-do classes of native society, and a visible increase of declared pauperism applying for public relief—these are some of the ways in which distress *consequent* on drought makes itself felt at a very early stage, and are at the same time certain indications to the local officers that distress, more or less severe, is prevalent in the district.

No doubt sometimes first appearances of distress are exaggerated and its severity misrepresented, but there is no risk of their escaping early notice; the risk rather is that, with the knowledge of the existence of distress, the local authorities may either propose measures of Government relief prematurely or delay doing so too long, both errors certain to be productive of evil and involve the State eventually in unnecessary expenditure.

Sir Digbijai Singh, G.C.S.I., Mahárája of Bulrampur.—At the commencement of famine the causes of the first appearance of distress to the people are apparent. The sowing process being over, a very small portion of the grain in store is left to the cultivators. When the rains fail in the month of " Sawán " (*i.e.*, from the middle of July to the middle of August) the prices of food grain in the markets begin to rise, and the poor people that are not cultivators at once begin to feel the effect of famine. The poorer among the cultivators, who depend upon work for their support, having spent away the whole or a greater portion of their grain in store, and seeing no good prospects for the future, are put to much trouble, and are compelled to ask their landlords for loans of grain for their support. The landlords, on their part, do not dare to part with their stores in such times. The cultivators are then subjected to more and more distress, and they keep with great care the small quantity of grain of which they are possessed at the time, so much so that they do not distribute the usual alms to the poor beggars, who are consequently reduced to the most wretched condition, as if near to death. When the report of these circumstances reaches the Government, orders are issued for the organisation of relief works and poorhouses for the support of the distressed people.

In great towns and cities the effect of famine is felt, first of all, by the poor people who depend upon work for their subsistence; for the dealers in grain, as soon as they find the prospects for the future unfavourable, begin to raise the price of food grain, which becomes at once a source of evil to the poor. In this case, if the market rates be carefully regulated by the proper officers of the Government, the distress may be, in a great measure, mitigated. In such towns and cities there are many old and poor people who depend for their support on their wealthier relatives and friends, and there are numerous beggars who depend upon public charity. In times of famine, when public charity vanishes away, such people are left helpless, and they then hang on Government for assistance. Many of them migrate to other districts, and life becomes a burden on them. In this circumstance the Government only can take care of such persons. It will be well to obtain, through a trustworthy official, the census of such afflicted persons, and send those who are able to work to the relief works opened for the purpose, and those who are old or unable to work to the poorhouses.

If it appear to the Deputy Commissioners of the districts that the famine is likely to last for a short period, and there is no fear of it in the future, it will be well to keep open the public and municipal works till the termination of the famine. At the same time it will be advisable to superintend the rates of the market, and keep them on a just scale, and to require the dealers in grain to lessen the price according to the nature of the crops and the supply of grain in the markets. Then such labourers on the relief works as may seem able to earn their bread somewhere else may be dismissed from the works; but those that are employed solely for the purpose of being supplied with food should be retained. When the harvest be gathered in, the market be abundantly supplied with grain, and the rates revert nearly to the original state, the relief works may be closed.

But when the famine be of a formidable nature and do not appear to vanish after a short duration, and the number of helpless persons be so great as not to be supported by the ordinary district poorhouses, the Government should open poorhouses on a large scale, at proper places, and therein feed such persons without extracting any labour from them. For such persons as cannot leave their place of abode, for several reasons, it will be proper to keep, in every great "muhalla" or village, depositories of grain, and to distribute them tickets, by showing which they should be supplied with their daily rations from the said depositories.

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Mr. Barlow.—So far as working upwards and forcing themselves upon the notice of the district officer is concerned, the actual sufferings of the people in the very early period of distress disclose but the smallest outward and visible signs. Close and continued personal observation of individual cases can alone be relied upon to secure their detection. Referring to the Orissa famine, and omitting the case of one particularly isolated tract between the sea and the Chilka Lake, where symptoms of actual famine were discovered as early as November 1865, the state of actual distress, which must have prevailed generally in all districts was not discovered by the officers who were anxiously and carefully watching for it. It was not until May 1866, when the people began to come into towns, and actually famine-stricken objects showed themselves, that the reality and magnitude of the calamity was fully recognised and acknowledged.

Similarly, in February 1874 I made a tour in North Bhagulpore in company with the Collector, to examine into the state of affairs. We had no difficulty in ascertaining the fact that the crops had failed and all classes were freely predicting distress, present and to come; but beyond an unusual congregation of beggars at our camping places, which might be explained by the knowledge of these people that we were prospecting famine and the hope of something to be gained thereby, our opinions as to the existence and extent of distress had to be based more upon the theory of what must be the effect of the failure to the crops than upon conditions of actual suffering amongst the people generally that we were able to discover. This fact is probably explained by the circumstance that the poorer classes concerned are at all times in a comparatively destitute condition. They live from hand to mouth. They have no property, nor anything in respect of which distress or famine can operate until it touches their bodies. Emaciation takes some time to appear. The lowest classes always supplement their food with an admixture of herbs procured from field or jungle. The proportion of these is increased as pressure increases, and even after the consumption of wholesome food has entirely ceased, life is preserved by subsistence upon *sag*, &c., until prostration.

A district officer would, I suppose, judge whether distress is due to temporary or local scarcity, or likely to be the forerunner, of very general severe distress ending in famine, by observing the extent of failure of crops and the range of prices in his own district and elsewhere. He would also consider whether the last year or two had been years of plenty or otherwise, the state of stocks, trade, &c. As regards the state of crops and prices, I think that existing means are sufficient for keeping officers informed of what is going on; what with weekly notifications in the Gazette, newspaper reports, and communications (personal) between officers, and lastly, the action of Government itself early in the season, when times become very threatening. The state of stocks and trade under the Bengal system is a knowledge to which the district officer cannot attain. Government are collecting statistics of river trade at registering stations, and they receive the railway traffic returns. These may be conveniently supplied to local officers as soon as a means has been devised whereby they may know something about the produce of their districts, but not beforehand. This point will be noticed in detail under question 5.

My opinion is most distinctly that the existing district organization is not sufficient to ensure early and trustworthy reports as to distress. The direction in which it fails has been indicated above. The information which comes before all officers alike is vague, wanting in detail, and often inaccurate. This naturally produces a similarity of views and tone amongst officers of all grades, and with the tremendous responsibility involved, no man can take a line of his own with any confidence, whether it be in the direction of raising an alarm or resisting one. The remedy which naturally suggests itself for this state of things seems to be to reduce the unit of administration. Given a year to prepare beforehand for certain famine, I suppose that by sub-dividing sub-divisions and districts, and putting officers to work under active supervision, in areas of a moderate size, we should be able to make a list of the names and numbers of people that would be likely to require relief. In the absence, however, of any possibility of keeping up a permanent organization of this kind, while we wait for famine, there is no alternative open but to try to render the present agency (which should be strengthened wherever and whenever opportunity permits) as efficient as possible. I think that the way in which this may be best helped forward is by putting into the hands of the district officers accurate statistics regarding the food supply, and the economic condition of the agricultural and labouring population of their districts. If this was done it should lighten the difficulty of dealing with matters when bad times come. The district officer should then have a fair idea at least in what quarters to look for loss and distress, and by a system of closer inquiry within limited tracts, calculations more approximately correct than the general ones heretofore adopted might be worked out. This is probably the idea that the late Lieutenant-Governor, Sir G. Campbell, had in view when he created the Subordinate Executive Service in Lower Bengal; but owing to the occurrence of the famine of 1874 immediately after, and the staff becoming from the first swamped in the general administrative work of the country, statistical inquiries have been hardly touched up to date.

Although the staff available is small, I think that a beneficial result would soon be apparent in this part of the country if they were steadily kept at work upon the subject in hand. In order to effect this, I would constitute a Statistical Department in charge of the officers of the Subordinate Executive Service in each district in Bengal, and I would put a stop to the miscellaneous administrative work done by them, which was heretofore performed by the ordinary district staff. New measures, like taxation, &c., should pay for the agency necessary to introduce them.

Mr. Worsley.—Distress, consequent on drought, first makes itself felt among the people by compelling them to reduce their daily consumption of food grains, and to part with such property as they may possess in the shape of clothes, trinkets, &c., in order to obtain money for the purchase of food. If the district officer be a man of active habits, his own personal observations will apprize him of the existence of distress, but in any case the distress will be soon brought to his notice by the police.

The three harvests of Behar are *bhadoi*, *aghani*, and *rabi*. The first two rarely fail in an equal degree in the same year, and I should say generally that the total failure of any one harvest would not in itself cause famine. I have never myself known any instance of a *bhadoi* harvest falling below eight annas, and a failure of the crops to this extent would not cause me any anxiety. It is the combined failure of the *aghani* and *rabi* crops that causes famine, and a failure of the latter harvest usually follows a failure of the former.

When the latter rains, *i.e.*, the rains of August, September, and October, have generally failed and a very short rice crop has been reaped; when little or no rain has fallen during the winter months, and *rabi* prospects are poor; when the reports of neighbouring districts are unfavourable, prices high, and importations small, the appearance of distress under such circumstances would lead me to apprehend severe general distress in the future. If on the other hand the failures of the rains and harvests have been confined to my own district and one or two neighbouring districts, and if prices be kept down by importations of food, I should fear nothing more than temporary scarcity. But even with the worst prospects in February or March, a favourable change in the weather, such as to admit of "*cheena*" being widely sown and a fine mango season later on might serve to avert severe general distress. From the time when the failure of the rains is an ascertained fact, the attitude of the district officer and his subordinates should be one of constant watchfulness, and the former should make a point of visiting every portion of his district during the ensuing winter. In this district there are unusual facilities for obtaining early and accurate information regarding the state of the crops and the condition of the people, owing to the large number of indigo factories scattered about the district. The information supplied by planters, sub-divisional officers, and the police, and my own thorough knowledge of the district and frequent excursions into the interior at all seasons of the year, make it very improbable that distress should take me by surprise at any time.

Mr. Hodgkinson.—It is not in the appearance of the people themselves that a district officer will look for the earliest indications of distress. At the best of times the poorer classes live very sparingly, and the deterioration of their condition in times of dearth is very gradual. After they have been reduced to half rations, or to one meal a day, for some time, signs of want and emaciation may be traced in the persons of the children. But long before this period is reached the existence of distress ought to be recognised and measures to relieve it commenced, unless indeed a new harvest is just at hand. The distress in 1866 was taken in hand too late; relief works opened at an earlier stage would undoubtedly have mitigated much suffering and saved not a few lives. So silently was the distress borne, and so slight were the outward signs of it, that few in the district had any conception of the extent to which it had grown when relief depôts were opened.

The district of Sarun was at the Census of 1872 found to be the most densely inhabited agricultural district in the Lower Provinces. The population averaged 778 per square mile, varying from 605 in Baragaon *Thana* to 984 in Musruckh. The people, except in some half a dozen of the principal towns and trade centres, live almost exclusively by agriculture. Though the fertility of the district is extraordinary, the area is limited, and by the pressure of requirements of the ever-increasing families of petty maliks and the more influential cultivators, as well as by the growth of indigo cultivation, principally on the *zuraut* system, large numbers of the poorer classes have lost their lands altogether; and holdings have become small by sub-division. There is therefore, an unusually large labouring population, a population, for which even in good years the district barely affords adequate employment. It is naturally amongst this class that in years of dearth distress first makes itself felt. Employed ordinarily in field labour, a long drought at agricultural seasons of the year restricts their subsistence. If the former harvests have been good and they have been able to put by a little store, or if prices are moderate, some time will elapse before anything like actual general distress shows itself; but distress more or less severe must be the necessary concomitant of a continuance of the drought for any lengthened period. High prices and the difficulty of obtaining labour are the consequences of drought first felt by the people. The returns furnished from the district bazaars are sufficiently good evidence of the prices; and the resort of unusual numbers to the ordinary road repairs if going on, as well as an unusually active emigration from Sarun in search of temporary employment in Cooch Behar and eastern districts, will generally prove the short demand for labour in the district.

In order to form an estimate of the character of the distress, the safest indications may be ordinarily derived from a consideration of the prices at the different bazaars of the district taken in connection with a general estimate of the food supply of the district and of the country generally, as well as with the prospects of any crops which may be or should be on the ground. The power and direction of trade will also have to be considered, and the quantity and distribution of the rainfall. Special circumstances will also affect the estimate. Thus the hailstorm of February 1866 directed attention to probable intensity of distress in a particular tract, and the failure of the poppy in the present year points to the unusual impoverishment of a particular class. The existing district organization is supplemented by a large non-official class in this district, and the receipt of early and trustworthy reports is fairly secured. But undoubtedly something could be done, and I think ought to be done, to obtain agricultural and trade statistics. Our estimates of stocks in hand are the veriest guesses. In Behar the *ptwaris* might well be made by law to file statistics of cultivation. They might not be very accurate at first, but they would be at least better than nothing. I obtained statistics through the *ptwaris* when at Hutwah for a portion of the estate, and found them, as far as I was able to test them, a fair approximation to the truth. In the bazaars a *chowdry* might be appointed at a very inconsiderable cost, and with a little training and supervision at first from some of the district staff, tolerable estimates of exports and imports might be arrived at.

Mr. Metcalfe.—If the police or sub-divisional reports state that the lower classes are beginning to leave their homes and wander about; that petty grain thefts are increasing; that the village markets are scantily attended; that beggars are increasing; that ornaments are being pledged, it is to be taken for granted that local distress has actually commenced. It is a very remarkable fact that, as soon as the pressure of famine is felt in a village, the inhabitants proceed to wander over the country, partly in search of vegetable roots, and partly in the hope of finding food which they cannot obtain in their own villages or fields. It is to my mind one of the most painful signs of the scarcity of food to see women and children wandering restlessly, silently, with downcast faces, through the mango topes and jungles searching for food, knowing that none will be found, yet still hoping to find some vegetable food or berry to appease the pangs of hunger. It will depend very much upon the character of the sub-divisional officers and their active habits, how far the district officer can be guided by

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their reports as to the exact extent and magnitude of the impending scarcity. In most instances he will do well personally to visit the places indicated without any loss of time. The district officer will be warned, too, by the advent of beggars into grain marts and towns that the scarcity has already affected the very poorest of the population.

It should be an important part of the duty of every police officer to submit weekly reports of the agricultural prospects of his police station. The police in Behar have been gradually instructed to do this, but my experience is that it is still difficult to obtain accurate information from them. As a rule, police reports are too general in their character to be of much practical use in conveying accurate information. For many years the police have regarded themselves as a body for the suppression of crime only, and are backward in reporting on many general subjects which it would be useful for the district officer to know. The districts which have a patwari agency are far in advance of those districts which have only the police information to guide the district officers. In my opinion, the existing district organization in Behar is sufficient to ensure early and trustworthy reports in agricultural matters. The police and sub-divisional officers have now by experience learnt to regard weather prospects as important a part of their duties as criminal work.

So many of the larger districts have been sub-divided that there are few tracts beyond the personal supervision of a magisterial officer. The reports on rain-fall, submitted weekly to the district magistrate, keep him informed of the condition of the crops and of the agricultural prospects of his district. Within the last few years the local police have been gradually worked up to the importance of reporting on agricultural prospects. Formerly little attention was paid to this subject of crops and weather by either sub-divisional or local police; but even under the existing district organization it is quite possible for high prices to rule in parts of a district, virtually reducing the poorest class to great distress without immediate attention being called to this subject. Zemindars, even in cases where their tenantry are concerned, are found to be dilatory in conveying information.

Previous to the Behar famine of 1873–74, there were five occasions in which local scarcity of food grains prevailed within a period of 17 years; on each occasion there was more or less loss of life amongst the pauper population; yet these partial failures of crops at the time attracted no marked attention. The agricultural poor accepted the distress with that marvellous patience and meekness characteristic of the native in famine years almost without a murmur. My opinion is that the district officer must trust chiefly to his own energy and activity to ascertain exactly the area and extent of scarcity. Although much may be done—

(*a*.) By training police officers that their attention must be directed to the agricultural prospects, as well as to the detection and prevention of crime.

(*b*.) By raising the position of the subordinate officers of police, and introducing a better class of men as inspectors.

(*c*.) By encouraging correspondence between district officers and landed proprietors on agricultural matters. Letters addressed by collectors to zemindars asking specific information invariably meet with a ready response, though the information given is not always accurate or sufficiently in detail.

Mr. Kirkwood.—In Bengal (Lower Provinces) the existing ordinary district staff, if well turned to account, is quite sufficient to ensure early and trustworthy reports. People now-a-days are so well aware that it is the desire of Government to aid the famine stricken in their affliction that they are not slow in bringing to light any features of an alarming nature. Even at the end of 1865 in Orissa they did so, though the Government policy was not then so certain, and they for some time, even in the face of discouragement, persisted in not remaining silent.

BOMBAY.

Bombay.

Mr. Spry.—Distress consequent on drought first makes itself felt,—

(*a*.) By a rise in the price of all the necessaries of life.

(*b*.) By the demand for labour decreasing below the supply.

This distress is first brought to the notice of the district officers,—

(*a*.) By personal observation.

(*b*.) By perusal of the returns of rain-fall, of the prices current furnished by the different *taluka officers*; of the reports respecting the condition of the people and crops furnished by the same officers, and of the police reports on the subject of crimes, especially dacoities, gang robberies, and thefts.

A district officer might judge whether the distress is due to temporary scarcity by considering the time of the year when such distress takes place. For instance, if it breaks out say in April, he might reasonably conclude that the ordinary break of the south-west monsoon in June would bring down the prices of grain, and would also afford occupation in field work. He would judge whether it was due to local scarcity, by ascertaining the prevailing prices of grain in surrounding and accessible districts.

He would judge whether the distress was likely to be the forerunner of very severe general distress ending in famine,—

(*a*.) By considering the season of the year. If it broke out after a failure of the monsoon rains and during the time when the crops are being or should be harvested, the presumption would be that it would continue increasing until the next harvest came in, unless measures were adopted for mitigating it.

(*b*.) By ascertaining whether similar conditions prevailed in surrounding accessible districts.

To ensure that indications of distress are brought to his notice, the district officer should insist on all his subordinate *taluka* officers moving actively about in their charges, and punctually reporting the condition of the people, prices, &c. He might also invite the opinions of intelligent *inamdars*, landholders, and other natives of position.

The existing district organization is, in my opinion, sufficient to ensure reasonably early and trustworthy reports, I will not say entirely trustworthy reports, because a margin must always be allowed for exaggeration and sensation. I cannot suggest any other measures, nor do I think them requisite.

Mr. Charles.—Distress first shows itself by an increased number of beggars and strangers coming into the larger towns.

The existing organization is quite enough to bring the fact to light if the *Mamlutdars* do their duty, and are constantly warned to report all indications. The question whether the distress will develop into a famine or not depends mostly on the crops of the area from which the district draws its supplies, whether within or without its own borders, and, further, on the condition of the surrounding districts.

Thus if the crops in Bellary and Kaladgi had failed a scarcity in Dharwar would be nearly sure to turn into a famine, because not only would a large part of our supplies go to these districts, but we should also have to feed large bodies of Kaladgi and Bellary people, who would be sure to leave their homes. An inter-

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change of information between contiguous districts would seem necessary.

Mr. Propert.—On drought becoming apparent, the demand for field labour ceases, and consequently a very large number of persons throughout the country lose their occupations. The grain merchants, who carefully watch the prospects of the season, on the appearance of drought at once raise prices of food in the bazaar. This, of course, quickly affects the poor Musalman population of the towns. Employment and assistance are at once demanded, and the district officials naturally bring the state of affairs to the notice of their superiors.

At the outset no district officer can tell whether the distress is simply due to temporary scarcity. Local limits must of course depend upon circumstances. Experience can alone show the probable result of the distress. If drought commences very early in the season, and no rain falls subsequently, so as to enable sowing operations to proceed, it may safely be inferred that severe distress will ensue.

No special steps are necessary; the district officers are frequently inundated with complaints concerning the prospects of the season when no real cause for anxiety exists. When distress is really imminent there is certainly no chance of information on the subject being in any way withheld.

As before stated, in this part of the country no difficulty whatever is experienced in gaining information concerning scarcity. The village and *taluka* establishments, are quite sufficient for the purpose.

Mr. Norman.—Distress is first brought to the notice of the local officers by crowds of people flocking to the head-quarters of each *taluka* and clamouring for relief. Distress is first caused by a general rise in prices and the absence of the usual field labour, such as weeding, cutting grass, sowing, &c. Local officers can only judge whether distress is likely to be local and temporary or permanent and severe by the accounts received of rainfall in the surrounding districts and provinces. Rain returns are periodically received by Government and published. The existing district organization is ample to ensure early and trustworthy reports.

Mr. Hamilton.—It would not be before all hope of a sufficiency of rain had passed that apprehensions regarding a famine would be felt. If the first S.W. monsoon failed entirely there would be undoubtedly scarcity for a few months, but the later crops might turn out first-rate, and in such a case no famine would be feared. I do not think a district officer could fail to observe the first symptoms of a famine in this district. The village officers are constantly attending the taluka head-quarters, and then would report to the *Mamledars* the state of their respective villages, whether sowing operations had commenced, or whether there was distress among the people. Summarised reports are submitted weekly by the *Mamledars* to assistant collectors, so that in any case of doubt no delay need arise in making preparations for meeting temporary distress.

Mr. Moore.—The withdrawal of private charity, and the consequent appearance of beggars, who collect together and must be supported. Then the lowly paid village servants and the poorer class of cultivators and labourers begin to feel uncomfortable, and the latter to wander about in a state of uncertainty, getting into bad condition gradually; for, unless Government provides it, there is no work for them, and food is withheld by those who possess it.

The district officer can judge by the nature of the season whether distress will be local or temporary or general.

The revenue and police subordinate officials would be warned to be on the alert, *Mamlatdars* and chief constables would make daily reports; and on the appearance of any distress village inspection would be organized.

The existing district organization is sufficient to ensure early and trustworthy reports; it is only when distress becomes widespread, and house-to-house visitation is necessary, that extraneous aid is required.

Among the existing district organization I include schoolmasters and sub-registrars and municipal servants.

Mr. Robertson.—Distress consequent on drought first makes itself felt by the rise in the price of food grains, and the absence of employment for the labouring classes.

As we have a *Mamlatdar* or local officer in each *taluka*, and again *patels* and *kulkarnis* in each village, the village officers soon bring to notice the fact that the times are hard. The *Mamlatdar* immediately makes his inquiries, and reports to the assistant collector in charge of a *taluka*. No local scarcity can bring on a famine in the locality in which such scarcity exists, as, thanks to railways and roads, grain would pour in at once.

If the rains should hold off, the local officers (*Mamlatdars* and assistant collectors) will be on the watch. Should the rains hold off so that the *kharif* cannot be sown, or if it prove unfavourable for the growth of the *kharif*, they will expect some difficulty. If the unfavourable season is extended and seriously affects the rabi, then they cannot fail to know that the chances of severe distress are greatly augmented.

The reports regarding the weather and crops are submitted so often to the officer in charge of a *taluka* that he must be blind if he is not well aware of the state of matters.

The present district organization is amply sufficient, in fact I may say perfect, as regards ensuring early and fairly trustworthy reports. There is a natural tendency amongst native officials to be rather alarmists, but an assistant collector knows the man he is dealing with. Further, I am glad I can say that in this presidency an assistant collector, if he had any doubt of the information given him, would at once ride into his *taluka* and see things with his own eyes.

MADRAS.

MADRAS.

Sir W. Robinson.—It would be impossible to devise more certain means of knowing the precise condition of the crops and of the people in every village, than we possess in South India. We have in every village a village establishment; and we get from every village periodical statements of crops, &c., with reference to the Revenue administration.

Wandering is always the first sign of pressure of want in the homes of the poor and it at once indicates deficiency of attention and relief where both are most urgently needed:—namely, in the villages.

Mr. Price.—In an increase in the price of food, and consequent falling off in the quantity procurable.

What I, as a district officer, would take as a sure indication of coming bad times would be a very considerable failure in the crops of the preceding year, followed by failure of the monsoons in the year under consideration. This, with increasing prices and increased demand for employment on the part of the laboring classes, ought to be a sufficient warning to prepare for the worst. The crowding of women and children to works, the sale of ornaments, the falling off in condition of the mass of the people, and the increase in crimes against property, come at a later stage; but they succeed with marvellous rapidity the period when a district officer may definitely declare that famine exists in his charge. I do not think that there can be any difficulty, if a district officer is fairly on the look out and knows his district, in distinguishing temporary and local distress from what may eventually end in famine.

Local Distress.—I speak now of a district only—can be easily enough dealt with; so can temporary, where for instance there has been a very serious failure of the crops of one season, but it is clear that, unexpected and improbable circumstances excepted, the next will prove good and the period prior to the expected harvest has alone to be tided over. The difficulty is to tell the exact period when temporary distress begins to pass into famine, and when the State should step in with relief measures of an extensive character.

I have no suggestions to make as to the course to ensure that indications of distress are brought to the notice of district officers. I consider, however, that districts and divisions, as a rule, are far too large. The staff of Native subordinates is also too small, and their charges are too extensive to allow of their being readily worked.

Mr. Longley.—Distress is first felt by insufficiency of food resulting from high prices, which is indicated by people supplementing the same with deleterious roots and fruits, which they would not eat as food in ordinary seasons.

The district officer would ascertain this from the monthly price returns received from the taluks and from special reports to be submitted to the collector by the Tahsildars through the divisional officers.

Temporary distress is indicated by the rise of prices consequent on large exports to other districts. Local distress manifests itself by rise in prices caused by a failure of crops in a particular part of the country. The signs of a general severe distress are discovered from (1) the unfavourable prospects of a coming harvest, (2) the state of the stock in hand, (3) the abnormal rise of prices consequent on the above two causes, and (4) the *intense anxiety* of the cultivating classes (small puttadars especially). These indications were all present in December 1876, when a *severe* distress was apprehended.

The submission weekly by Tahsildars to the collector, through his divisional officer, of reports showing (1) the state of crops, (2) the prices of grains, and (3) the condition of the laboring classes, and the frequent visits of the collector and his divisional officers to the taluks to *test the accuracy of the information received* are sufficient. No other measures suggest themselves.

The existing organization is quite sufficient for the purpose, and I have no other measures to propose.

Mr. Webster.—The existing district organization suffices to ensure early and trustworthy reports of rain-fall, cultivation, health of people, and a tolerably fair report of the out-turn of crops. But this information, as I have said above, is not sufficient to enable a fairly accurate forecast to be made. What is needed is an accurate return of the stocks of food-grains in the district at the commencement of each month. Such a return could not, however, be prepared without a large establishment and considerable inquisition. Estimates are made, but they are framed on no sure basis, and must, from the nature of the case, be a mere surmise. The quantity of rail-borne grain imported into, and exported from, the district can easily be obtained, but it would be necessary also to ascertain the imports and exports by land. This would be the greatest difficulty, and would require a considerable establishment. It would not be difficult to ascertain the actual outturn of the crops in a village, though the returns would most probably be under the mark as the ryots would think there was some new form of taxation in view. At present the Curnam prepares the return of outturn on a mere guess. He takes the number of acres cultivated under each crop in his village and calculates the amount of outturn at so much per acre. This will be far from correct, because the rate of yield per acre is arrived at on no fixed principle, and because the lands which, although cultivated, have no crop are not omitted from the calculation. I think that with our comparatively small villages and village establishments to which some addition would, if necessary, be made, and looking to the measurement of the produce as a recognised custom of the country as between landlord and tenant, there would be no difficulty in having all the crops in a village measured. It is doubtless an inquisitional and therefore a somewhat retrograde measure; but I do not think we should compare India with other countries more fully developed, and some such arrangement must, I think, be made. The information thus collected would tell us approximately the monthly out-turn of the district, and an estimate could be formed after a few years of the quantity of grain required for the consumption of the people for a year. We could then, on a failure of the cultivating rains, judge the then state of the stocks, how long they are likely to last, when and to what extent to be supplemented, and could forecast when they would be reduced so low as to materially raise the prices and thus cause distress, and when, if not supplemented, a famine of food.

Mr. J. G. Horsfall.—Distress first makes itself felt among the poorer classes by the diminution in demand for field labour owing to the stoppage of agricultural operations, by their consequent inability to purchase their usual food supplies while prices are doubled, trebled, and even quadrupled the prices in ordinary years. The district officer first of all receives, from his divisional and taluk officers, reports of an unfavourable season, of the withering and loss of crops, of the want of work for the labouring classes, of the failure of pasturage for cattle, and of drinking water for the people. He is inundated with petitions from the ryots praying for remission on account of the loss of crops. There is usually a sudden rise in prices followed by extensive increase in grave crimes, robberies, and dacoities, by panic in the bazaars, and by a marked increase in the number of persons soliciting alms. Ascertaining that high prices are caused by failure of crops, and not by exportation of produce to other districts where distress may previously have arisen, the district officer has then to learn the condition of surrounding districts and the state of the markets throughout the Presidency at least. Should reports from all quarters or from his neighbouring districts be no better than those of his own district, he may reasonably conclude that distress is likely to be general and to be followed by famine modified or intensified accordingly as immediately preceding harvests have or have not been plentiful. A district officer of any experience of his district may miscalculate the extent to which distress may reach, but can never be mistaken as to the sign proclaiming it coming. Famine follows a bad season, and should, with the exercise of ordinary caution and judgment be foreseen six months beforehand.

The existing district organization is sufficient to ensure the district officers being fully informed of indications of coming distress. Indeed, the danger is that they will be magnified and exaggerated, and to check this tendency it should be the district officer's first duty to gather by personal inspection of his district the extent of failure. He should also call for weekly reports from each taluk as to the rain-fall, extent of cultivation, condition of crops, stocks of food grain, prices, extent of demand for labour, movement of people, increase in crime, state of health, disposal of personal and real property including cattle and land, and the direction of trade whether export or import.

Mr. Martin.—A district officer who keeps his eyes on his price lists and on his rain-fall registers ought to have no difficulty in predicting the approach of distress of some sort. It is then his duty to send special orders to his Tahsildars, Deputy Tahsildars, Revenue Inspectors, and superior office establishment to go on tour in different parts of his range, while he should himself take such a tour without delay as will give him a pretty accurate idea of the state of production from

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MADRAS.

the last harvest and the anticipations of the people themselves. The reports to be submitted by the subordinate officers should notice the estimated production both as arrived at by the officers themselves and by the accounts given by the village officers; they should state whether many or any of the people showed signs of suffering in their physique, whether they are living on unusual or unfit food, whether they have parted with their property to an unusual extent, and whether any of them who ordinarily do not emigrate have left their villages. If the failure of crops appears by general report to be very general and of a high per-centage coupled with high prices and a deficient or badly-distributed rain-fall, and above all if the wells are very low when they ought to be full or nearly so, then such indications of distress as I have noticed will probably mean twelve months' famine if it occurs in the Madura District at the close of the north-east monsoon, particularly if neighbouring districts are similarly affected. If such indications occur at the close of the south-west monsoon, the distress has a much shorter time to run until the arrival of the north-east monsoon rains, and in the first year of distress it will not be severe, because there will still be the grain grown in the previous north-east monsoon, constituting the great bulk of the food-supply, to prevent the markets running very short.

I consider that the existing district organisation here is sufficient to ensure early and trustworthy reports, if the ordinary office-work beyond what is absolutely necessary be postponed, and the divisional establishment be freely deputed on tour in different directions.

Mr. Cook.—If district officers be constantly on the move, the present organization would, I think, suffice for early and trustworthy reports; but it is very essential that a district officer should move about when distress is imminent, for Tahsildars (owing to their multifarious duties) and others are either inclined to be apathetic, as they hate the trouble of famine duty and thus conceal real facts, or else they are over-frightened and exaggerate the true state of things.

Lieutenant-Colonel Hasted.—Work rates remaining the same while the price of food is increasing, ordinary labor, such as tank diggers, as prices increase, forsakes the scattered works in the villages, and flocks to works in the neighbourhood of towns and large bazaars, and then migrates to more favored districts, where food is cheaper. Small cultivators, cultivators' servants, and low-caste people (Malas) who do not usually work under Department of Public Works, will then come on works, and later on ryots of a better class. If the scarcity is temporary or local, the tank-diggers will leave the distressed part, but the other classes will not; if famine is to be anticipated, all classes will begin to move to where food is more plentiful.

MYSORE.

MYSORE.

Mr. Ricketts.—By high price of grain and less of it coming into rural towns and markets for sale. The district officer has in great measure been forewarned of this by his own observations and by the reports of assistants and amildars, added to the communications of unofficial natives whose thoughts, conversation, and even correspondence run much upon crop prospects and prices. Temporary or local scarcity would be produced by failure, more or less, of crop in a limited area, and where the sufferers would mostly be relieved by going to their friends or relatives or to well-to-do employers in other places, or getting direct help from them, and there would only be a small residuum to be helped by some relief work. But where the area affected by drought is large, the knowledge of the impending distress is soon brought to the ken of all. The poor can find no private employment, nor can they get those money advances which are readily obtainable at other times in return for their labour. As the crops go on failing or withering, the straw is sold for present maintenance without regard to the future. Then fowls are sold at any obtainable price, and after that cattle, and then ornaments. These indications of a regular famine occurred in this district so early as the latter part of the year 1876, and then in the beginning of 1877, when all available resources were disposed of, began the wandering of the poor.

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QUESTION 2.—CLASSES OF THE RURAL POPULATION FIRST AFFECTED.

Which classes of the rural population are first affected by serious failure of crops likely to produce famine? In what way are they affected, and how is the effect manifested? Do the early applicants for relief consist of whole families or of isolated individuals? Are all sexes and ages equally represented, or do women and children preponderate among them? So far as the applicants are field labourers deprived of employment, does this arise because the employers have no money or grain to spend on wages, or because there is nothing to do in the fields?

Punjab.—7 officers have answered. The replies are of the same effect as above. Women and children form the bulk of the first applicants for relief.

North-Western Provinces.—33 officers have answered the question. The opinions expressed are similar to those from Bombay. The women and children come first for relief, the men still finding, or hoping to find, employment at home.

Bengal.—21 officers have answered. The majority think that the agricultural labourers are first affected and village artizans, and that women and children first come on relief.

Bombay.—12 officers have answered the question. The substance of their answers is—

The classes first affected are: (1) beggars, (2) the lower village servants and artizans who receive payment in kind, (3) the labourers for wages, (4) the poorer cultivators. They are affected thus: charity ceases, and then field labour. The women and children apply first for relief. Field labourers suffer because there is nothing to do in the fields.

Madras.—21 European and 5 Native gentlemen have replied to this question.

The classes of the rural population first affected by serious failure of crops are said to be (1) the agricultural labourers; (2) the petty landholders; (3) handicraftsmen; (4) beggars and persons more or less dependent on private charity. The first are thrown out of employment; the second are deprived of their ordinary means of subsistence; the third find less demand for the product of their industry; and as regards the fourth, the surplus of which in good seasons they are participators has no existence when harvests fail. In the earlier stages of distress applicants for relief rarely come in family groups. Women and children preponderate over the adult male element. The failure of employment for the labouring classes is said to be due in the earlier stages of distress more to the suspension of agricultural operations consequent on drought than to the want of means on the part of employers.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—The distress is first felt among the poorer classes of agriculturists who own little or no land, and have a large family to support, and who are already indebted to the village bankers, and always pay their revenue by borrowing money from them and who at the harvest time make over their grain to the village bankers in payment of their debt. These people suffer on the first approach of scarcity; they cannot obtain any loan of money for the purchase of food, seed, or cattle, and are obliged, when pressed by hunger, to sell their household goods, not even excepting the timber of the roof of their house. When all resources are exhausted, they leave their home with their family in search of employment. The able-bodied among them obtain their livelihood by working as labourers, while the infirm and children go to large towns for the purpose of begging. They do not, as a rule, move in a body, but get themselves dispersed in the country. Besides the poorer classes of agriculturists, the lower orders of the working population, such as *Churás, Dúmnás, Jolláhá, Mochí,** also suffer on the first outbreak of the distress. These people entirely depend on the cultivators for their maintenance, and it is natural that when the latter are unable to provide for themselves, the menial labourers and artizans must, as a matter of course, suffer. In last year's scarcity, when the price of food grain rose very high, they left their villages in large numbers. The sweepers generally took to thieving, and satisfied their hunger by eating stolen cattle. Relief works on a small scale were opened for them in different localities, and they with their women and children were employed in them, while those who were unable to work received gratuitous relief. In this manner a considerable number of them were relieved of their distress. The effect of distress manifested by the different classes of rural population was not always the same. The lower order of working men, who generally obtained their livelihood from the tillers of the soil, left their village with their wives and children on the first appearance of the distress; but the cultivators were slow in applying for relief; they stood manfully till their last resource had been exhausted, when no work was left to them in their fields, and when they could not obtain any loan of money or grain from their bankers; in short, when reduced to the last extremity, they (only the male sex) left the village in search of employment. They supported themselves and their family with their earnings, but when the distress became severe their women and children also left their homes. They did not go out in a body, but dispersed themselves in different directions, each seeking for his or her bread. In time of distress the owners of land, with a view of economy, dispense with the necessity of hired labour and work for themselves. This is another reason why the poorer classes of cultivators and labourers are thrown out of employment on the first approach of scarcity. When they do not find any work at home they roam about in the country in search of employment. These men can be most profitably employed on earth-work.

Captain Wood.—The resources of the district have not, however, been taxed by the temporary distress I have noticed. We have had, and have still, to deal with a much more numerous and difficult class, *viz.*, immigrants from Kashmir and Poonch.

It is unnecessary here to describe the deplorable state of the people of these territories, for this is already well known to Government.

Notwithstanding the prohibition of emigration by the Kashmir and Poonch authorities, numbers of famine-stricken Kashmiris have found their way into this district; and these are the people to whom my remarks will specially refer.

These refugees are for the most part of the labouring class, who in favourable seasons earn sufficient for their sustenance, but who owned little or no land in their own country. The complete failure of the last *kharif* (chiefly maize and rice) threw these unfortunates out of employment; and in the early part of this year they were found in hundreds in and about Murree in a state of the most utter destitution. These were mostly women and children, lads under 15, and infirm old men.

I am informed that the present *kharif* is favourable, but that so many of the labouring hands have died and disappeared that the rice crop will probably be only ¼th of what it ought to be, from want of hands to weed and tend it.

Lieutenant-Colonel Parsons.—(*a.*)—The village menial classes are first affected by a serious failure of crops owing to their being the poorest, and living a hand-to-mouth existence; next to these the cultivators and petty landholders.

(*b.*)—Applicants for relief are usually accompanied with their families. (*c.*)—Women and children somewhat preponderate in quest of relief. (*d.*)—When there is failure of crops there is no work for the field labourers, nor wages to pay them, as the wages are paid in kind out of the reaped harvests.

Mr. Coldstream.—The classes of the rural population which are *first* affected by serious failure of crops are the numerous village menials and handicraftsmen, such as weavers, sweepers, tanners, potters, and carpenters. These classes in villages of North India are dependent for their subsistence upon the cultivating proprietors of the village, and that subsistence is usually paid to them in grain, and not in cash. When drought has occurred, and stocks of grain run low in the houses of proprietors, the means of subsistence of these classes is wholly or partially withdrawn.

All sexes and ages suffer equally, and the first suffering is not because there is nothing to do in the fields; but because the proprietors have little or no grain in which to make the usual payments to the village menials (*kamíns*).

Mr. Roberts.—The classes who first feel the pressure are village servants and agricultural labourers, who are never able to make provision for the future, but are paid by a per-centage of grain at harvest time, or else are supplied by the proprietors through the dull season of each year, on condition of giving their labour when required. Distress next falls upon small landholders, whose crops are generally mortgaged to the baniáh for advances, and who are supplied by him with food at *bazár* rates to support them while the crop is coming on. As soon as the *baniáh* perceives that the crop is likely to fail, he stops his supplies, or gives them on progressively harder terms, and he is able at any moment to reduce his customers to the point of starvation. Such small proprietors, living in this precarious way, are very numerous, especially throughout the country, while agriculturists who have a stock in hand for future contingencies are quite the exception. Able-bodied labourers, without children, generally leave the villages of their own accord, and get employment wherever large earthworks are in progress; but proprietors are always

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* These men suffer first of all. H. P.

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anxious to retain them at home as long as possible, so as not to lose their services when required; and to this end they supply them with food as far as their means go. Those having wives and children cannot easily be induced to leave their villages even when the pressure of famine has been severe, and these soon become too weak and emaciated for any sort of labour. Among the applicants for relief, women, children, and aged men largely preponderate. Distress among field labourers results partly from the impoverishment of their employers, who, as I have said, oppose emigration, and support their labourers as long as they can, and partly from the failure of field work.

Mr. Benton.—I can corroborate what the Honorary Assistant Commissioner of Kaithal says, that low caste people, such as Chúras and Chamárs, are the first to feel the pinch. During the latter part of the month of July last I observed whole families of these people moving along the grand trunk road in the direction of Umballa, a great many of them much emaciated by want of food. I put questions to numbers of them, and found that they had come from Gurgaon, Rájwára, *i.e.*, Rájputána, Agra, &c., and were going towards the Punjab, because they had heard there had been rain there. The Chúras preponderated. These people live, a great many of them, by doing jobs for landholders or taking service with them. When famine comes there is no work to be done, and no service to be had, and they must leave for some other part where they can get work, or starve. The case of these people, the common serfs of the village, is different from that of the agricultural castes. Only lately I observed that a good many Játs and other agriculturists from Rohtak and neighbouring districts, on account of the distress, had taken refuge in the canal villages by working for some one of their own caste for subsistence only. A Chamár or Chúra would not meet with similar assistance from his caste people.

The wanderers I have spoken of consisted of whole families, people old and infirm, able-bodied, and infants in arms.

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NORTH-WESTERN PROVINCES AND OUDH.

Mr. Sells.—As far as my experience goes, I should say that *women* and *children* preponderate amongst the first applicants for relief—those, in fact, who are dependent upon their own labour, widows and their children, and orphan children, who may have lived mainly on charity, which is now denied them.

Mr. A. Colvin.—*Chamárs* and weavers. There is no demand for their labour, and the effect is manifest by their leaving their homes and beginning to roam the country. The early applicants for relief are of both kinds. At first men in this district predominated. Both want of labour fund and absence of demand for their labour combine, but in the early stages of famine the latter chiefly.

Mr. Sandys.—The field labourers among the rural population, being chiefly *juláhas, koris,* and *chamárs*, and also the infirm and habitual mendicants, are the first affected; they can get no employment or charity near their villages, and are consequently thrown out of work or left without food; and whole families as well as single individuals take to begging and wander about and crowd the towns, and soon become very importunate in their demands for food. Women and children preponderate.

The field labourers are deprived of employment, as there is nothing for them to do in the fields. When there is no drought their employers have money and grain to spend on their wages; when prices are high and prospects uncertain many of the employers do themselves the work that in ordinary years would be done for them by hired labourers.

Mr. Tracy.—Ploughmen and other day labourers and their families are the first of the rural population to suffer. The stoppage of field work leaves them utterly destitute. They leave their homes, and beg or crowd to relief works if any are open. The first applicants for relief are generally men. They are followed by their families. Until the distress becomes severe, men preponderate; subsequently all sexes and ages are equally represented. The main cause of the distress of field labourers is that their usual employers have no work for them and turn them adrift.

Mr. Mellor.—The agricultural labourers who do not possess lands of their own no doubt are the first sufferers. When there is temporary distress only, and where there is work to be got in the fields (which were the conditions prevailing very soon after relief works were re-opened here in June last), the women and children largely preponderated among the applicants for relief. This was to a certain extent to be expected, as the field work which the rains called into operation, *viz.*, ploughing and sowing, could only be done by the men, and the men therefore stayed at their villages and sent their families to the relief works; but how far the excessive number of women and children on the works is due to the order of Government insisting on a minimum wage being paid to all it is difficult to say.

Mr. Kennedy.—Beggars, unprovided widows, and the criminal classes, all of whom are habitually bordering on starvation, are perhaps the first to feel the pinch of hunger. The beggars begin to wander over the country and crowd into towns, unprovided widows begin to beg openly in the villages, and petty thieves display fresh activity. The delay of the rains for three or four weeks is sufficient to bring this about, but the first symptom of general distress consists in the migration of the field labourers in search of employment.

In 1877 this migration began about the end of July. Individuals first, and then whole families wandered about the country, but hunger and demoralization soon began to dissolve the ties of family or caste, and single individuals wandered about in an automatic fashion incapable of either resolution or thought. To this movement was soon added the class of petty cultivators scarcely above the field labourers in condition.

Mr. Leeds.—The class of agricultural labourers is the first affected, the reason being that the demand for their labour is greatly restricted, and further, that with their scanty means they are unable to procure sufficient food at the enhanced prices.

The early applicants for relief consist very generally of isolated individuals, women and children preponderating.

Field labourers are driven to apply for relief from a combination of both the causes mentioned; there is not only less demand for their labour in cases where it would ordinarily have been employed, but very much less work to be done in the fields by anyone.

Mr. Lawrence.—Day labourers, the poorer handicraftsmen (such as weavers, potters, and cobblers), and tenants without right of occupancy, are the first to be affected.

In ordinary years the labouring classes are employed as reapers, and get as their daily wages a bundle of corn yielding from four to seven seers of grain. When the crops fail, the cultivators, in order to save a few maunds of grain, do what reaping there is to do with the help of their families, or if they employ labourers,

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give them little more than suffices for a day's subsistence.

Ordinary handicraftsmen, such as potters, washermen, carpenters, receive at harvest time certain dues of grain. These are cut down when the harvest is short.

Early applicants for relief consist at first of isolated individuals, and afterwards of whole families, women and children preponderating.

Field labourers are deprived of employment partly because the employers want all the grain for themselves, and partly because the harvest is so light that it can be got in by the cultivator and his family.

Mr. Cornwall.—The rural population first affected by a failure of the crops are the poor non-agriculturists, by whose labour the agricultural classes are supplied with what in ordinary seasons are looked on as necessaries, and in hard times luxuries. After them the agricultural labourers feel it. The cultivator can no longer afford to keep them supplied with food; if he is fortunate enough to have a crop, he attends to it, and weeds his fields himself, carrying home the weedings for his cattle; and if he has not, he goes out to cut grass or canes for them. These men are consequently driven to seek a livelihood away from their villages, and every main road shows, all along its length at such times, scattered parties of two or three, each with his load of grass for sale to the drivers of passing carts: and grass at the usual resting places being insufficient to meet all demands, these loads meet with a ready sale. A subsistence is to a certain extent derived in this manner, but the food thus obtained is insufficient, even when eked out with roots and berries, to keep off hunger. On a relief work being opened these people flock to it.

At first a relief work is attended generally by isolated individuals, and the women and children come afterwards, and usually their numbers preponderate. But there seem to be local circumstances which are liable to overthrow all calculations; for instance large numbers of people last year from the Etáwah district passed through the south of this district on their way to Málwa, their only reason for going there being a tradition that a similar migration took place in the famine of 1837–38. Large numbers of these came from the same village; and though none stayed at the relief work then open on the very border of this district, they may, if pressed by hunger, have applied for relief at a later stage of their journey, and so large gangs consisting of several families may come for relief at once. These people leave their villages quite suddenly and without any settled plan in many instances, intending to settle where they can find fodder for their cattle and get land to cultivate themselves; and any mishap, such as the death or increasing weakness of their cattle, or their own inability to trudge further, may throw them upon relief works. So far as the applicants for relief are field labourers, their application is due to both the causes mentioned. What little work there is to be done in the fields the cultivators do themselves, and the zemindars turn off all field labourers that they can possibly do without, if they are unable to support them. Last year, so far as the zemindars had it in their power they assisted their poorer neighbours with grain; and at these seasons, the wealthy *mahájan*, even though at other times he may be deemed a hard landlord in exacting higher rents than his neighbours, keeps his village better in hand and his tenantry more contented than the penniless *Thákur* community of the next village.

Mr. Webster.—The applicants at relief works are in the early stages of distress chiefly women and children sent there by their husbands; but very soon after the works are open, if pressure continue, the men come in too, and the sexes are pretty equally represented. (This is the result of my personal observation, and I do not generalize on it, knowing it to be far too narrow to carry a theory; but the question was asked and had to be answered.)

Both causes—want of ability to pay wages on the part of employers and want of anything to do in the field—combine to deprive day labourers of employment.

Mr. Stoker.—A proprietor will support and keep together his people as long as he can. He has to do something of the sort in the best of years. In those parts, therefore, I should regard the appearance of unemployed and destitute masses as symptomatic of very severe distress. Again, from the harvesting of the rabi crop till the rains there is comparatively little to be done in the fields. Very large numbers will be found at that time to flock to almost any employment which may be afforded at almost any rates which may be offered, and such a phenomenon does not necessarily mean famine. This was one of the most conspicuous facts to be noticed in Gorakhpur in 1874.

If the distress be severe and general all sexes and ages are fairly represented in their actual proportions. I should consider it a favourable sign to find an undue preponderance of women and children. It would mean that there was still some occupation and subsistence for the men—that it was only the distress of short rations, not of total want—and analogously as the famine ends the women and children linger after the men have abandoned Government relief.

Colonel Reid.—The classes first affected by serious failure of crops are old and infirm persons dependent on their relatives, low-caste field labourers for hire; also artizans, weavers, and professional beggars. Field labourers are affected by loss of employment, arising both from there being nothing to do, and from employers having no money or grain to spare to spend on wages, and consequently doing themselves what in better times they would hire labourers to do for them. One of the first indications of distress is a spirit of restlessness among the sufferers; they have no special ties to bind them to their villages, and move off, both as individuals and in families, to other districts and great cities in search of employment. Husbands frequently desert their wives and families, and women and children decidedly preponderate among the applicants for relief. Children at the breast are the greatest sufferers, and of these numbers die.

Ordinary cultivators as a class somehow manage to pull through one season of severe distress, and, unless their bullocks die (which unfortunately they often do), are able, with more or less assistance from their *zamindars* or village *mahájans*, to resume their cultivation when prospects improve, though a portion of them, varying according to circumstances, sink for a time, if not permanently, to their position of labourers for hire.

Mr. Blennerhasset.—It would appear that on first feeling distress the male members of a family wander about in search of employment, leaving the women and children at home. Women and children usually predominate on all Government relief works, many of the women being unable to state what has become of their husbands. Occasionally a whole family put their property into a basket and wander about together.

S. II. Qn. 2.

Bengal.

BENGAL.

Mr. Barlow.—The class of the rural population first affected by serious failure of crops in this part of the country is the agricultural labourers, comprising Mussahirs, Kallan, Dhanooks, Jalahers, &c. These have little or no land of their own, no cattle, and no ploughs. They work for hire and get their wages in money or kind. These people live from hand to mouth. The harvest time is their season, when they are paid so many bundles in proportion to the crop cut, and they are thus able to lay by a little store, which lasts them for a few months, while work is slack. It is obvious that any failure of the crop promptly tells upon these people, for it takes away their work and subsistence at once. In hard times the expense of labour would be avoided as far as possible, and work done would probably be paid for inadequately.

Mr. Worsley.—The classes which are first affected by serious failure of crops likely to produce famine are musahars, nunyas, weavers, kahars, and generally those classes which live for eight months of the year on manual labour, and earn their livelihood during the remaining four months by reaping crops. Wages being paid in sheaves of corn at harvest time, these classes are at once affected in two ways by a failure of harvest—(1) they are employed for a shorter term than usual; (2) the proportion of grain to stalk which they extract from the sheaves is smaller than usual. The consequence is that the labourers are unable to make their usual savings from their wages, and sooner or later their supplies fail. By reducing their daily consumption of food, and by resorting to unwholesome herbs and roots, they postpone extreme want for a time, but day by day they lose strength and their bodies become thin and emaciated. During this stage an active district officer cannot fail to observe the coming on of distress. In every village which he passes empty sheaves are held out before him, and the villagers complain of their losses and point to the deteriorating condition of the poorest members of their community. The early applicants for relief consist of isolated individuals, and women and children preponderate among them. So far as the applicants are field labourers, deprived of employment, this arises because there is nothing to do in the fields, and because they are without their usual reserve of food.

Mr. Magrath.—The first persons touched are the labourers who hold no lands themselves but work for hire. When the crop fails to come up, or is destroyed, there is no work of weeding, transplanting, reaping, &c. They consequently receive no grain (payments in kind being general), their store from the previous crop is soon exhausted, they cannot borrow money to purchase for they have no security to give, and therefore, unless there are local works going on where they can obtain employment they must starve. This was the case with the musahars in Madhubanni. Another class that suffers earliest is the village artizans who do not happen to have land. Most of them it is true have, but in 1874 we found that the village sonars in Madhubanni in very many cases held no land and were very badly off; the *tantees*, too, being generally landless and poor were very early amongst the applicants for relief.

In the beginning of scarcity the males sell their brass utensils and furniture or pledge them, and leaving the proceeds with the women set out in search of work, either sending for their families when they find work, or sending them back money, generally the former. When the scarcity becomes general the whole family moves together. I have always found the men largely in excess of the women and children. The only class of women who come for relief without a proportion of men are the childless widows, who support themselves during times of plenty by going from house to house husking dhan and grinding atta, receiving remuneration in kind for their work. The field labourers first become impoverished because there is no work to do in their fields. Later on their employers often have no money or grain to advance them if they desire to do so.

Mr. Hodgkinson.—The labouring population, which I have described in my answer to question 2, is the first to feel a serious failure of the crops. The way in which the different classes of society are affected has been well described by Mr. Cockerell (*vide* page 367, administrative experience of former famines). My experience has been that, when relief works are opened, women and children predominate among the comers. The men of the family usually find labour in the fields for a time at any rate; and during an agricultural season I should regard the appearance of a large proportion of men at the relief works (unless indeed the famine had reached a very advanced stage) as a pretty sure sign that they were too attractive, and being carried on to the detriment of the country. The deprivation of employment induced by the class of field labourers arises generally from the restriction employers have to place on this expenditure, and only, rarely, as for instance, in May and June when no rain falls, because there is nothing to do in the fields.

Mr. Mackie.—The classes of the rural population first affected by serious failure of crops are the coolies who perform the actual work of cultivation, who possess no land, and have saved nothing. It being impossible for the ryots to give them ordinary field work, it naturally follows that having nothing to fall back on either in the shape of land, which they could mortgage, or in money saved, they are the first to feel the pinch. I should say women and children largely preponderated among early applicants for relief, for not only have most men some such dependent on them, but cases of desertion are very frequent. As regards the second part of this question, I should say that distress arose because there is nothing to do in the fields, and not because the ryots have no money or grain to spend on wages. I doubt whether the ryots do not almost always have large stores of grain concealed, for every village fire that I have witnessed either in Nellore or Tirhoot, disclosed very large stores, the existence of which had been strenuously denied by every villager.

Mr. Henry.—Of the rural population the following classes would be the first to be affected by the failure of crops:—

1st. Daily labourers tilling no land of their own.

2nd. Cultivators with small holdings.

3rd. Farm servants permanently entertained by the well-to-do cultivators.

Where there has been failure of the crops the employment of labour for reaping the harvest will be less in proportion to the extent of this failure.

In this district one sheaf in every 10 is allotted to the reaper. In other words, a wage fund, equivalent to 10 per cent. of the harvest out-turn, is available for the employment of labour. Consequent on failure of the crops the harvest out-turn is less, and the wage fund is proportionately diminished; the first therefore to feel the effects are the expectant reapers, amongst whom the daily labourers largely predominate.

In ordinary years cultivators with small holdings are able, to store, after paying landlords and mahajans, just sufficient to keep them during the winter harvest period before the next crop.

In bad years this out-turn is below the average and the residue they have for storage is insufficient for their food during the whole inter-harvest period. The time when they begin to experience scarcity is nearer or more remote, as the failure of the crops has been more or less serious.

In very bad years the more substantial cultivators find that their surplus is insufficient for the wants of their households. For self-preservation they are forced to practise economy by dismissing some of their farm servants. This rarely occurs I believe, the servants being so bound up with their master's interests that the latter will make considerable sacrifices to retain them; but still it does occasionally occur.

The farm servants, deprived of the daily food they had hitherto received swell the number of those seeking employment. The district officer who, from other indications, will have already made a forecast of the conditions of the people, is not unprepared for the applications for relief which will now be made to him.

So far as my experience goes, early applicants for relief are isolated individuals; numerically men one in excess of women, and the latter much in excess of children.

As already stated, the first immediate cause of distress is the smallness of the harvest; there is less grain to spend on wages, because there is less work to be done. Later on, employers having no surplus grain or money employ no labour.

The experience gained from the famine of 1874 shows that, as soon as the time for agricultural operations comes round, there is a sufficient wage fund available, even during a period of great distress.

With the setting in of the periodical rains in Tirhoot in the summer of 1874, thousands and tens of thousands left our relief works to return to their villages.

Mr. Metcalfe.—The earliest applicants for relief are chiefly aged or middle aged women of the lower castes with children, who preponderate among the earlier applicants.

Mr. Kirkwood.—I believe women and children to form the majority of the earlier applicants for relief. That this should be so in the lower classes, when they have no adult male relative on whom to depend, is easily conceivable. When in the lower labouring classes they have such male relatives it often forms one of the first measures taken by the head of the house for weathering the storm to get the children and then the women supported, while he tries to earn something somehow for the maintenance of himself and such of his family as cannot be sent forth to beg.

Mr. Brookes.—The ordinary agricultural labourers and their families, whose employment depended on the prosperous condition of the growing crops, are generally the first to suffer. This is manifested by unusual numbers of women and children to be seen collecting tank weeds, roots and seeds of grasses, and other substitutes for the grain they have no longer the means to purchase or the credit to obtain without payment. They seldom at the first stage of distress resort to begging.

The early applicants for relief consist more frequently of women and children; later on all ages and sexes are equally represented.

Field labourers out of employment are mostly so because work in the fields is not required, and seldom for the want of money or grain.

Mr. Abbott.—The regular mendicants and the poorer class of cultivators suffer considerably more than the mere labouring classes, for whom the indigo factories and other industries and trades generally have employment sufficient to prevent actual distress during first stages of famine. To a planter one of the first signs of hard times is the noticeable increase of women coming to field work. The labouring coolie seldom applies for relief before Government has itself seen the necessity of helping him. The cultivating ryots, unable with the prospects of a poor harvest to raise money from the village *mahajun*, are forced to do without hired labour what field work they may have; hence the coolie must turn to the larger capitalists and industries alone for maintenance.

The *Bawan* and other Hindoo petty cultivators suffer most, for they will neither beg nor work for others until very badly pressed. Every *zamindar* or *ticcadar* in the district should, when famine appears inevitable, be called upon to furnish an estimate showing the amount of loan necessary to keep off actual distress from each family of this sort living on his property; and himself conjointly with his tenant be held responsible for the future repayment of the advance, the land and property, moveable and immoveable of both, being mortgaged to Government as security.

CENTRAL PROVINCES.

Central Provinces.

Mr. Nicholls.—Experience has shown that in Chhattisgarh the agricultural labourers and the lower ranks of the cultivators are the first to suffer.

In the rest of the province (putting aside the mendicants) we have seen that the spinning and coarse-cloth weaving classes, especially those who for a part of the year engage in field work, are the first to suffer.

In Chhattisgarh these agricultural classes have no other occupation and now no field work to do, no credit and no resources.

Among the spinning and weaving classes, the people will be disappointed and losers by not getting the expected cash payments for labour in the fields. The ordinary demand for their coarse produce would not provide for them during these weeks in their spinning and weaving occupations, and they become unremunerative consumers of food. In addition to this, the normal demand for thread and coarse cloths, ordinarily at this season too small to employ them, will rapidly contract as the prospects of the season grow more gloomy and as food grows dearer. Generally agricultural labourers would be reduced to distress, only in cases where employers could find no work, even at a loss to themselves, on which to give employment.

In regard to the early applicants for relief, their sex, age, &c., my experience is not wide or recent enough to enable me to answer decidedly. In Jubbulpore in 1869, many men seemed to have gone away to earn money on the railway works in the Nerbudda Valley, leaving their women and children to struggle on or to be supported by us. In Dinagepore, where we kept ahead of famine, the village headmen, mandals, and others, used to give us warning when the people in any particular tract were likely to break down without relief by employment. There will in these provinces be begging by classes who are generally independent, by men, women, and children, long before any applications for Government inteference are made. And I should expect first of all not the applications of individual sufferers, but recommendations for the giving of employment, coming from the leading malguzars and municipal committees, by the tahsildars and police officers.

BOMBAY.

Mr. Spry.—The smaller cultivators and the day labourers are the first among the rural population affected by serious failure of crops. The former are entirely dependent on their annual crops, and therefore the loss to them is immediately manifest. The latter are unable to get the daily labour on which they depend. Further, the drought would probably have killed all the green grass growing in fields, and therefore these day labourers would be unable to get a livelihood by gathering and selling that in the bazaars.

The effect is manifested by increased application for employment.

The beggars, who generally subsist on charity, are I think the first applicants for relief, as they find that charity drying up. Then will come the able-bodied labourers, &c., and if there is a chance of getting work close at hand, they will come in families so that all may get put on. When they come thus there is of course the usual proportion of women and children. Often, however, a man who can himself pick up work will send his family.

In this district I take it that the want of employment during the earlier stages of the last famine arose from there being nothing to do in the fields. Employers locked up their capital as all expenditure would be unremunerative.

Mr. Charles.—Beggars of all kinds and day labourers are the first to feel the effects of serious failure of crops. The dole of handfuls of grain to beggars is put a stop to as soon as people fear their stocks may run out, and no labourers are employed in weeding when the *ryots* see reason to think the labour would be in vain. The early applicants for relief are more often isolated individuals, each family sending away such members as can be spared from the house.

Men chiefly seem to come at first, but I cannot say I observed any definite custom.

Field labourers come on the works because there is nothing to do in the fields. If one year's crop has been sown but does not come up there is nothing that can be done till next cultivating season comes round, and all the work the field labourer has usually, in weeding, hoeing, watching crops, and in reaping, is entirely stopped.

Mr. Propert.—Agricultural labourers and inferior cultivators, as well as the village artizans, &c., who are dependent for their livelihood on the cultivating classes.

Field labour ceases, and the labourers cannot get employment. Artizans fail to obtain their grain allowances from the cultivators. *Saukars* at once refuse supplies of money or grain, and the poorer classes commence wandering in search of work. The authorities are besieged with applications for relief, and work has to be provided.

As a rule the earliest applicants consist of individuals, except in the case of Bhils and such wild classes who proceed with their wives and children to the nearest official, clamouring for work or relief.

I have noticed that, amongst those who merely wander for the purpose of begging, women and children preponderate. The males generally ask for employment.

Field labourers are deprived of employment simply because there is no work in the fields. If there were any work at all employers would not turn off their labourers, but would retain them even at reduced wages.

Mr. Ramsay.—So far as I have seen, coming distress is first manifested by a large increase among the begging class, mostly old, sickly, and infirm persons. Next labourers and others depending on doles at harvest time begin to clamour for food or employment, but no doubt a great deal of distress is endured before it comes to light. When distress arises from failure of rains, it is of course chiefly owing to want of work in the fields, high prices, and scarcity of grain in the houses of the people, and the stoppage in consequence of petty charities and doles of grain, upon which so many old and infirm persons depend. The closing of the labour market is of course the chief cause of distress, as labourers have no credit on which to borrow or buy.

Mr. Norman.—The classes of the rural population first affected are the lowest castes, comprising *Mhars*, *Mhangs*, and to a lesser degree, *Ramoshis* and the poorer classes of *Kunbis* who are without lands of their own, and usually subsist by day labour. These are affected by a stoppage in the demand for labour and by a general rise in prices. The early applicants for relief consist chiefly of women and children, accompanied by those who are too old to work. Occasionally whole families present themselves. Field labourers are deprived of employment, because there is nothing for them to do in the fields.

Mr. Hamilton.—The people first affected appear to be labourers who earn their livelihood by weeding the fields after the young crops have appeared. With them are the lower village servants, who receive payment in kind from the villagers in return for various offices performed, such as watching the fields at night, &c. If no steps were then taken to open relief works these people would emigrate in search of work to places where they heard good rain had fallen, but village servants generally remain in their villages much longer than mere labourers. These latter have no claim on cultivators who have no crops to be tended. Women and young children seem to be the first to clamour for relief.

Mr. Moore.—I have answered the first and second questions in the paragraph above.

The early applicants are isolated individuals, but if there has been a serious failure, mothers and children appear, the men having gone in search of labour.

Because there is nothing to do in the fields, and because those who have money and grain hold both back.

Mr. Robertson.—(*a.*) First the professional beggars.

(*b.*) Next the *Mhars* and *Mangs*.

(*c.*) Then the agricultural wage labourer.

(*d.*) Then the less well-to-do cultivators and all the poorer classes who live by wage, but owing to dear prices do not obtain employment. Employers of labour at such times become careful to curtail all expenses.

They are affected—

(*a.*) By getting less from charity.

(*b.*) By the cultivators who generally aid and employ these people in some way, refusing to give them grain.

(*c.*) By their being unable, owing to cessation of field labour, to obtain employment and earn money to buy food.

(*d.*) The poor cultivators, owing to their being generally in debt, to their having no stocks of grain for home use and thus being reduced to want. The poorer classes generally, owing to there being no employment, and thus being unable to earn money to buy food.

Early applicants for relief generally consist of parts of families. Women and children preponderate, but not very greatly.

So far as the applicants are field labourers deprived of employment, this arises chiefly—in fact, almost entirely—because there is nothing to do in the fields.

MADRAS.

Mr. Whiteside.—Petty landholders are the first to feel severely the effects of a general failure in crops. They do not usually work themselves, but superintend the cultivation of their little holdings by a few pariahs or people of other low caste, whom they employ on small monthly wages, usually paid in grain. When these people's crops fail, and there is a general rise in prices, they dismiss their workmen (who for some time will be able to find employment in other ways sufficient to support themselves) and reduce their expenditure to the lowest point. If the scarcity continues and their stocks of grain become exhausted, they then sell their cattle, reserving the ploughing bullocks as long as possible. Afterwards their little hoards of money are fallen back upon, and then the jewels of the family, after which the brass and bell-metal household utensils are sent to the pawnbroker, and finally lands and houses are mortgaged or sold.

Whole families do not at first appear in search of subsistence. The older members of a family begin to go out and beg. The adult males then wander away in search of employment, and it is not until the famine is thoroughly established that entire families will quit their homes and go to any distance. During the famine, the numbers of women and children largely preponderated often to such an extent as to cause much inconvenience. The men, in many cases, stand about the villages, looking after cattle, doing scanty jobs of work, and always on the look-out for any casual fall of rain that would enable them to begin to cultivate. Throughout the famine it was a notable fact that, after every good fall of rain, the numbers of adult males on the relief works fell off at once, and the men hastened to their villages to see what could be done in the fields.

Mr. A. McC. Webster.—The agricultural labourers, petty artisans, weavers, and the smaller class of ryots.

The ryots are affected by the loss of their crops on which they depend for their support, and the balance of which is sold to pay the Government revenue; the petty artizans and weavers are affected by the slackness of trade owing to high prices and consequent necessity of the people to spend what they have in supporting life; and the agricultural labourers are affected (and sooner than the others) by want of demand for labor in the fields owing to there having been no cultivation operations (ploughing, sowing, and weeding), to there being no demand for harvest labour, and to the ryot's inability to pay for labour. The habitual beggars also are affected very early in the day by the cessation of charitable relief owing to the inability of the people to look after others than themselves.

The effect is manifested in the distressed people wandering, in the increase of beggars, and in the people eating the fruit of the prickly-pear plants and the seeds of grasses and trees, also by a general backwardness of collections and by the sale of jewelry, cattle, &c.

Females preponderated at the commencement and have continued to do so all through the famine. At the height of the famine, however, the number of children exceeded that of women.

Both because the employers have no money or grain to spend on wages, and because there is nothing to do in the fields.

Mr. Price.—The classes of the rural population first affected by famine are the ordinary cooly-labourers, especially those of the Pariah and Woddah (navvy) castes. These men are occasionally petty holders of land. The rain fails, they have had a bad crop the year before, they are "hand-to-mouth" people, and very soon get through what little grain they may have hoarded up in store, and dispose of such of their property as is saleable; they have nothing to do in their own fields, there is no ploughing or reaping work to speak of, and what there is, is done by the ryots and their own establishments. The next class to feel distress is that which supplies the ordinary wants of the cultivators, who very soon cut off any thing not absolutely necessary; the largest section of this, which is scattered over the country, is the weavers. Some of these combine agriculture with their usual avocation, and when not working in their fields weave cloths for hire, the employer finding materials. Distress very soon puts a stop to their professional employment, and they have to fall back upon labour. Others of the weavers, who are simply artisans, sell up all they possess. During the famine a very large proportion eventually found their way into poorhouses (relief camps) and on to village-relief.

The petty farmers come next, and then the servants of the better-to-do ryots, who are obliged, as a rule, to economise and, as a first step towards this, to send adrift the labourers for whom they have no longer occupation. The way in which the classes alluded to above are affected by any serious failure of crops is in a curtailment of their food to such an extent as to produce a visible falling off in condition, which is first to be observed amongst the young children. Not only is the effect manifested in this patent way, but if relief is not given, offences against property increase. The early applicants for relief neither consist, as a rule, of whole families, nor of isolated individuals. My earliest experiences of relief measures were in connection with works alone, and I cannot recall a single instance out of many thousands in which a whole family came on the works. Isolated individuals were certainly numerous, but, generally speaking, there were two or three of a family. Some one was left behind to look after the house, &c., and others had, for a time, employment elsewhere, and it was not until the pressure of the famine increased very considerably and the people had deserted their homes in search of work, that whole families applied for relief. Women and children all through preponderated in poorhouses and on works and village relief. The moment that rain came the bulk of the men who could work went away to the fields, leaving the women and children on relief works in such disproportionate numbers that it was often difficult to find suitable employment for them. Adults, both male and female, from about eighteen to thirty, as a rule, form but a small proportion of the applicants for gratuitous relief. During the late famine they were to be chiefly found on works. As regards field labourers deprived of employment who come upon relief, the first and largest batch comes on to the hands of the State, because there is nothing to do in the fields; the second and smaller section is almost entirely made up of the farm labourers usually employed all the year round by the ryots. These men are turned off by their masters because they can no longer afford to support them.

Mr. J. G. Horsfall.—Field labourers who work for daily hire are the first to suffer from failure of crops. Agricultural operations cease with failure, and their ordinary means of livelihood is thus wanting. Failure of rain in the first instance prevents ploughing and sowing. The land remains waste. The ryot, the usual employer, has no need of his field labourer, and if he has hitherto been paying him daily hire dispenses with his services without further ado. Such labourers usually live from hand to mouth, and are consequently compelled to wander elsewhere in search of labour. As distress increases, the ryot dispenses even with his permanent servant, the paleru, whom he finds himself unable to maintain. The desertion of home and village seldom takes place till all credit is exhausted and all saleable property disposed of. Meantime their scanty food is eked out with roots, leaves, and fruits that are never thought of in ordinary years. Resort is had to grain pilfering, cattle mischief, robbery, and dacoity, and the Crime Register shows generally a large increase in crime. The first applicants for

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relief are men wandering away in search of work and leaving their families at home. Finding that work is not procurable, he returns to take his family with him in search of relief whether by work or charity.

Field labourers consist of two classes—those who are hired by the day, and those who are hired by the year or more permanently still. The first class are turned adrift the moment the ryot no longer requires his services; the latter are retained until the ryot becomes apprehensive that his stock of grain will not suffice for the wants of his own family. This latter class is looked upon by the ryot almost as his own property, and is only discarded when the ryot is forced by his own necessity to do so, just as he parts with his cattle for a mere song, or even for nothing at all.

Mr. Soobien.—In the case of labourers, absence of field and other work and consequently the absence of earnings to buy food, with no property to sell, follow as a result of a serious failure of crops. The failure of crops raises the price of food grains and places the quantity requisite for his subsistence beyond the reach of the purchasing power of his wages which, owing to absence of work, a glut in the labour market, and want of employers, are materially diminished. Thus a failure of crops operates in two different ways on the labouring class. It diminishes their earnings and lessens their purchasing power. The effect is manifested in the reduction of the quantity of proper food, in the recourse to unwholesome food, and in the consequent gradual emaciation of the body. Want of work in the vicinity of their homes compels them to seek for labor elsewhere, and this leads to emigration. Movement of bodies of labourers from place to place is also an effect of the failure of crops. Further, when honest labour becomes scarce and is difficult to be had, other ways, no matter they are dishonest, for appeasing the cravings of hunger are thought of, and this leads to lawlessness and crime. As regards the begging class, who ordinarily lived on the bounty of their neighbours, they find it extremely difficult to live such a life in a year in which there has been a serious failure of crops, and their clamor for food therefore becomes very great.

When distress has began to be felt the members of a family begin to disperse in different directions, and it is only on rare occasions that the applicants for relief consist of whole families.

When things come to such a pass that through want of work in the neighbourhood the adult male members of the family quit their homes and emigrate to different places, then it is that the women and children left behind them preponderate among the applicants for relief.

Both causes, viz., want of work in the fields and want of means on the part of employers, contribute to deprive field labourers of employment, but the cause of the employers having no money or grain to spend on wages operates, I think, to a comparatively less extent. If the employers see that there is the slightest prospect of a favorable season, there is usually no lack of interest on their part in commencing agricultural operations. They raise money somehow or other and employ the labourers.

Seetharamiah.—Agricultural labourers and artizans are first affected, and next agriculturists of small holdings; the former by being deprived of field employment, which is the only means of their daily livelihood, and the latter by want of grain in store and by want of money to buy it from elsewhere. Both classes of people are therefore obliged to dispose of their household chattels and live stock, and then leave their homes in search of work elsewhere, or assume the profession of beggars or commit petty thefts. If they cannot by these means successfully earn their livelihood, their physique is deteriorated, and gradually sickness prevails, and mortality increases. In the beginning of distress applicants for relief consist only of isolated individuals, and gradually of whole families when they find that they cannot live otherwise. Among the applicants for relief women and children generally preponderate, their proportion of the population being naturally greater. This being the early stage of famine, it is more on account of want of labour in the fields than want of money in the hands of employers that the labourers are deprived of employment.

Major Baynes.—(*a.*) Those who live from hand to mouth, that is, those who are dependent on daily receipt of food or of wage for their daily expenditure, such as cowherds, hawkers of grass, of greens, of curds, and of fuel, &c.; the first four, through failure of their stock in trade, are compelled at once to adopt some other means of earning a livelihood; the latter can only earn a bare subsistence under normal conditions; but, as soon as the price of grain permanently rises, that of fuel falls because the rich men will not pay even the usual price of it, so that in large country towns it was sometimes unprocurable, and these classes were driven, at a comparatively early stage of distress, to maintain themselves on grass seeds or by acceptance of State relief on works, in poorhouses, or in their villages.

(*b.*) Rarely in family groups; the larger number consisted of elderly women, chiefly widows, unmarried girls, and children of both sexes, who in one of the ways described above had been contributing to the family purse, and also of infirm paupers who had previously been maintained by their relations or by public charity.

(*c.*) Applicants and recipients of relief were of all ages, but the women and children greatly exceeded the males in number. I am unable to have recourse to returns, so speak from memory, but I think that I am accurate in stating the ratio of women to men on gratuitous relief was two to one, and of applicants for employment on relief works as eight to one. The preponderance of female applicants for work was so great that it was impossible to employ them all except at a dead loss to the work, and more specially to the *male* workers, because, when payments are made on tasks, directly a *superfluous* agency is employed, the receipt of each person engaged to perform that task is diminished. I have seen one hundred women and children clamorous for employment, but not a single man amongst them, and women would often work as men with mometies and pick-axes on women's wage sooner than be turned away. The number of children on works averaged, I think, about 25 per cent. of the adults, but on gratuitous relief and in kitchens they were nearly equal in number to the total of both sexes of adults.

This state of affairs to European experience seems strange, but is, I think, to be accounted for in several ways—

(1.) That at all times women in this country perform more manual labour than the men as field labourers, weeding, planting, and picking crops, as carriers of burdens, as suppliers of grass, fuel, and water; whereas the men are too indolent and too conceited to work at any task which custom has specially allotted to the women, and, as these embrace nearly every ordinary avocation of life, the men have not much left to do.

(2.) Fifty per cent. at least of the women under forty had been abandoned by their husbands or the men with whom they had cohabited prior to the distress.

(3.) Every woman in this country is a mother who is capable of child-bearing.

(*d.*) As far as actual labourers are concerned, because there is nothing for them to do in the fields.

Mr. Longley.—Of the urban population, the cooly artizans and other cooly classes (*e.g.*, the blacksmith dispensing with his cooly-bellows-blower on account of high prices) are the first to feel the effects of famine by loss of employment consequent on diminution of proper food.

By final deprivation of cereal food and resort to

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noxious herbs, &c., or alms to sustain life and a tendency to wander aimlessly away in search of livelihood, &c.

By local inquiries through Municipal and other local agency, thereby giving timely employment and thus preventing their tendency to wander.

MYSORE.

Mysore.

Mr. Ricketts.—The poorer or hand-to-mouth ryots and labourers and minor village servants, such as toties, taliaris, nirgantis, &c., who mainly depend upon their meeras or grain dues from ryots, and these dues in times of famine are naturally almost nil, and then come petty artizans and weavers, who in fact can earn nothing at such times; also gollurs and even wudders. It is not clear why gollurs should suffer so much unless it be on the supposition that their live stock is almost unsaleable in famine time. As a rule it may be said that those classes of the rural population suffer first and most who earn their livelihood apart from tillage and harvesting of crops.

The early applicants for relief consisted mostly of isolated individuals. Adults predominated over children. Females exceeded males in number mainly because there is nothing to do in the fields. Only the rich or exceptionally benevolent would or could go on feeding their field labourers when no equivalent was to be obtained in shape of their labour.

QUESTION 3.—CLASSES OF THE URBAN POPULATION FIRST AFFECTED.

Ch. II. Qn. 3.

What classes of the urban population are the first to feel the effects of famine, and in what way do those effects operate on them, and how do they manifest themselves? How may they best be watched and met in their first stage?

Punjab.—7 replies are given to the same effect. Distress in towns arises later than rural distress.

North-Western Provinces.—27 officers have answered. Chamars (leather workers) and weavers are first affected, because there is no demand for their wares. Relief works, municipal works, purchase of the cloth woven by Government are recommended.

Bengal.—14 officers have answered. Weavers and petty artizans; beggars. Many officers do not answer, others say they have had no experience of distress among urban populations.

Bombay.—10 officers have answered this question. The general opinion is—That the classes of urban population which first suffer are labourers for wages and petty artizans, especially weavers, the demand for whose wares ceases. Municipal committees may keep watch and assist these classes, perhaps by giving them employment in their own trades, or on municipal works.

Madras.—To this question 20 European and 2 Native gentlemen have replied.

The persons residing in towns amongst the classes who exercise trades and industries who first feel the effects of famine are artizans, weavers, potters, brick-makers, &c. Here, as in rural populations, the demand for their industry is diminished; the journeymen are dismissed, and later on the master workmen feel the pinch. In large towns Mahomedans and Brahmins, who in ordinary times subsist on the produce of lands leased out to cultivating ryots, or on the gifts of the pious and charitable of their respective persuasions, suffer severely, as do also professional beggars and religious mendicants.

PUNJAB.

Punjab.

Captain Wood.—The temporary scarcity in this district has not sensibly affected the urban population beyond the inconvenience attendant on high prices.

Colonel Parsons.—(*a.*) Of the urban population, weavers, sweepers, mochis, and other artizans. (*b.*) Earth works performable by persons of any occupation opened as near as practicable for their employment.

Mr. Coldstream.—The classes of the urban population which are the first to feel the effects of famine are the town mendicants. The usual doles of grain are restricted when scarcity begins, and the beggars feel the pinch immediately. They betake themselves to the poorhouse if they are allowed a dole there. The increase of applications at the poorhouse, if under reliable superintendence, is one of the earliest tests of scarcity in a town and its neighbourhood; and indeed I am inclined to think that the number and urgency of applications for relief at the poorhouse is, throughout a period of scarcity, one of the most reliable means of gauging the condition of the people. But, in order that this test may be properly applied, the superintendence of the poorhouse must be careful, intelligent, and independent.

The poorhouse at Hoshiárpur, which is under superintendence of the Rev. Mr. Chatterji of the American Presbyterian Mission, receives Rs. 100 per mensem from municipal funds, and, since the scarcity began last autumn, Rs. 50 per mensem extra have been granted from district funds.

It has been a most valuable agency, and itself constitutes an efficient test of the pressure of high prices.

In the milder forms and earlier stages of scarcity, I consider that increasing the grants to existing poorhouses and starting fresh ones is the best way to meet it.

Mr. Roberts.—Distress arising from drought does not so soon make itself felt in towns, where the trading classes are not so directly dependent on the produce of land, and have no fixed rent to pay, whether the crop is good or bad. The poorer classes of artizans are first affected. For instance, last year there was a dearth of cotton; the raw material rose in price enormously, and the cleaners, spinners, and weavers lost their employment and means of livelihood. In the same way an unaccountable stagnation in the shoe trade at Delhi affected the Mochis, Chamárs, and Khatíks throughout the district, and reduced great numbers of them to extreme destitution. These classes emigrate, and turn to other employments, or else subsist by begging. They have no one to represent their condition, and in large towns it is not easy to ascertain the extent of their distress. The Zaildár system does not apply here, and some special organization is necessary. Where municipal committees exist they might be utilized for the purpose.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Sells.—Of the town population, *chamárs* and weavers are the main sufferers, at all times a poor class.

Mr. A. Colvin.—Weavers, hangers-on, menial servants, poor relations, chamárs, small artizans, first feel the strain. By opening employment, municipal if possible.

Mr. Sandys.—The *juláhas*, *koris*, and *chamárs*, the infirm and habitual mendicants, are also the classes of the urban population that are the first to feel the effects of famine. The majority of them in ordinary years obtain a livelihood by manual labour and begging; some, however, eke out an existence by weaving and shoemaking. When prices are very high there is little demand either for manual labour, cloth, or shoes, and almsgiving is much restricted; and the classes named above suffer in consequence and are thrown out of employ or deprived of their ordinary means of subsistence, and consider themselves fit objects for gratuitous relief by the Government, and clamour for it, being most unwilling to make even the smallest return when it is given to them. As soon as it has been found necessary to start relief works in any district the magistrate of the district should be empowered to draft off to them all persons found begging in the streets of the towns and capable of performing work, whether they are willing to go or not. At first a very light task-work should be exacted from them, and as they became more accustomed to it the task should be gradually increased. If the number of aged and infirm found wandering about the towns is large, and prices are so high that there can be but little given in the way of charity, a poorhouse should be opened at the head-quarters station, and afterwards at each *tahsíl* as the distress becomes severe.

Mr. Tracy.—The effects of famine in towns are first felt by labourers and the poorer artizans, such as *júláhás* or weavers, *chípis* or calico printers, and *chamárs* or leather workers. They are thrown out of work and generally take to begging and theft, and often commit riotous attacks on the stores of grain dealers. Early commencement of relief works is the best way to check this state of things.

Mr. Mellor.—Of the urban population the *julahas* are among the first to feel the effects of famine. There was a great number, I know, in the Bareilly poorhouse last winter. These people were quite willing to work on being provided in the poorhouse with looms. Their own looms, they said, they had sold to buy food before they applied for relief, and there was no doubt of the truth of this, as I offered to buy or hire their looms for use in the poorhouse.

Mr. Kennedy.—The urban classes of weavers, pedlars, and others who depend upon the agricultural community are the first to show signs of distress, as their wares are the first superfluities with which the agricultural community can dispense. As the distress spreads upwards it affects all the retail dealers, except grain sellers. The city labourers are affected not by the agricultural distress as weavers and pedlars are, but by the contraction of expenditure which high prices and small incomes create among the middle urban classes.

On the other hand the demand for expenditure of food to the country may cause an increase of trade, or such an increase of wholesale trade may be due to extraneous causes independent of a famine, and this may bring about a prosperity which more than recompenses the loss due to the failure of the agricultural community. This was to some extent the case with the Sháhjahánpur city. The town population consists of a large landlord and money-lending class, and a very considerable trading class. The trade in grain and other produce swelled so much last year, partly on account of the famine and partly for other reasons, that it preserved the greater part of the city from any serious loss, and gave occupation to a large number of labourers. Even the weavers of the town suffered little, although their country brethren suffered severely.

The town weavers are chiefly engaged in the manufacture of fabrics for foreign markets, and therefore are not affected by the failure of agricultural society. The exports of native fabrics manufactured in the towns of Sháhjahánpur and Folkur only declined 25 per cent. while the village weavers were reduced to beggary. In the country towns of the district they manufactured only for local consumption, and therefore suffered as much as the weavers in the villages. The different fate of the Sháhjahánpur and the country town or village weavers illustrates the close connection between the pressure of famine and the economic relation between the town and the country. Another illustration of this may be found, in fact, that there was a general stoppage of trade in all articles of local consumption except grain. So far as this grain was imported from other districts it had to be paid for in cash or by exports. Accordingly when the rabi of 1878 was reaped an unusual quantity of oil seeds and wheat was exported.

Mr. Whalley.—The first class of the urban population which feels the effect of famine is the weaving class. The cloths they weave are purchased mostly by the cultivators in the neighbouring villages. A bad season leads the cultivators to economize first in the simplest and most practical fashion, in the purchase of clothes. The weavers' trade at once begins to stagnate. First their coarse cloths remain on hand and they cannot get rid of them. Very soon their necessities compel them to reduce the price of their goods, and this process goes on until the price of manufactured cloths sinks almost to the price of raw cotton, and there remains no possibility of earning a subsistence by the manufacture. The relative prices of cotton thread and manufactured cloth fairly measures the pressure of a bad season on the weaving class, and the only thing that can be done is to stimulate trade by Government purchases, which can be distributed for cloths to the paupers in the poorhouses, or made into tents for them, or reserved for after sale.

Mr. Lumsden.—The classes among the urban population who are the first to feel the effects of famine are the petty artizans and small traders, together with the class who earn a living as hired labourers. To these must be added the class who in England would be styled indigent gentlemen and women, natives of the upper classes who have seen better times, but who, some from circumstances beyond their control, others in consequence of their own conduct, are now in the best of times hard pressed to make ends meet, and to a great extent dependent on the assistance of relatives and friends, in the social scale to which they originally belonged, for the ordinary means of subsistence.

The regular pauper class of our towns and cities are of course also among the first to feel the effects of famine, for as sure as prices rise to what may be considered famine rates, the class on whose charity our town beggars are mainly dependent infallibly contract their purse strings, if they do not close them altogether. This is, I think, a peculiarity of ordinary native charity in this country; a threatened famine and the existence of widespread distress, which at home would give an *impetus* to private charity among all classes able to assist, have in this country quite the opposite effect.

It is not difficult to watch and be prepared with suitable measures of relief for distress among these classes of the urban population. Distress among them will at once attract the attention of the local authorities, and may for a time be met by offering employment at subsistence rates on ordinary local district and municipal works; but these will not suffice if the pressure is long continued or there are symptoms indicative of approaching famine. With the presence of work for those able for it, it will very soon be found necessary for Government, if their lives are to be saved, to afford relief to the professional beggar class, the aged, the lame, the halt, the blind, and other mendicants incapacitated from bodily infirmities or age from doing anything to help themselves. The only class among the urban population among whom it is necessary to be specially on the watch for symptoms of distress is the indigent or broken down men and women who belong to the upper classes, who will often put up with extreme privation rather than make an open appeal to public charity of any sort. Distress among this class can be best watched and dealt with through the instrumentality of native gentlemen, official and non-official, who should be charged with the supervision of the muhallas of the town or city, with the circumstances and residents of which they are each best acquainted. As a rule, however, I believe that distress calling for Government assistance will not be felt quite so early among this class.

BENGAL.

Bengal.

Mr. Barlow.—Amongst the urban population, weavers, *koeries*, *gwalas*, artizans, and poorer families of the better class first feel the effects of famine. At the same time that prices are high the richer classes become economical, and country manufactures are at a discount.

Mr. Magrath.—The labouring class, I mean those who have no trade but who carry loads, or help in any work that is going on, are always the first to come on relief (amongst them the childless widows I have spoken of), and soon after them the tantees and artizans who work only for the poorer classes, then the kunpas and petty tradesmen who deal entirely with the poorer classes in a small retail way.

For the labourers there is nothing to do but to put them to work at repairing roads, clearing out drains, cutting grass for fodder, and the like.

The artizans may be employed at their usual trade, materials being advanced and the labour paid for; the manufacture being sent to some prosperous places for sale. Old women can always spin yarn, and, if any relief is being given, can be employed in husking and cooking rice.

Mr. Kirkwood.—Weavers and petty artizans are the first of the urban population to feel the effects of distress. Lord Napier (1866, Ganjam) well wrote of them:—"It is obvious that the same causes which
" suspend the employment of labour in the country
" must also affect the welfare of those who live by
" small trades and manufactures. In this climate the
" necessaries of life may almost be restricted to fire
" and food, and the purchase of its simple comforts
" and ornaments can easily be deferred or abandoned.
" The dearth and dearness of provisions would alone
" account for the depression of industry in the
" towns."

BOMBAY.

Bombay.

Mr. Hewlett.—Among the urban population the small artizans and traders, such as weavers, potters, tailors, and such like, are, in my opinion, the first to feel the effects of famine. The demand for their particular manufacture or trade falls off and gradually dwindles until they are obliged to pawn or sell the very implements of their trade. Many cases of great distress among the Mahomedan weavers in towns and villages came to my knowledge during the famine. Even if the men leave in search of manual work, which they are not fitted to perform, the women remain behind, being generally *purdanishin* women, and suffer great hardship. I have known cases where the women and young girls who in ordinary times never leave the house have sought for employment at relief works to get food. In my opinion the only way to watch them is to employ Musalman inspectors to go round and visit house by house.

Mr. Spry.—Amongst the urban population the day labourers and the smaller artizans are the first to feel the effects of famine. Trade becomes slack, and the employers of labour reduce their operations. Hence those depending on their daily wages and those who have no resources first suffer. The labourers begin seeking relief work, and the artizans begin mortgaging their tools and implements.

The municipal committees, if they exist, are the best means whereby at the early stage of famine the urban population may be watched. Municipal works might also be opened for the labourers; and for the artizans, such as weavers, employments may be given them by the municipality by commission. At this stage, too, measures for yet further relief will be probably in contemplation, and the district authorities can usefully employ *lohars* in making hoes and picks, *sutars* in making their handles, and basketmakers in making baskets.

Mr. Propert.—The small manufacturers and labourers. In Khandesh the former are represented by poor Musalmans and *mhars*, who weave cheap and inferior cloth. The demand for their wares ceases, and as the above-named classes lead a precarious existence even in favourable years, any serious rise in the price of food quickly reduces them to the condition of paupers. In the first place they resort to begging, and subsequently they betake themselves to any small local works that may be available, but as a rule they prove to be very inferior as road labourers.

Where municipalities exist considerable relief may be afforded in the early stages of distress to the very poorest classes by the purchase of grain on the part of the municipal committee in the cheapest markets, and the retail sale of the same at cost price. Loans of grain or money without interest on the part of the richer merchants to the charitable committees are also very useful. It will generally, however, be necessary to start some small works from municipal or local funds at an early stage of scarcity, upon which the pay is merely sufficient to enable a person to exist. By this means district officers are enabled to judge whether the scarcity is sufficiently severe to induce people to leave their homes in order by work to escape starvation. After this fact has been ascertained, steps should be taken for the establishment of relief works on a proper footing, under officers of the Public Works Department.

Mr. Norman.—The urban population in this district was not seriously affected during the last famine. The poorer classes of artizans, such as weavers, leather workers, &c., are those who first suffer, owing to a less demand for their wares, and to the general rise in prices. As far as my experience goes, they require no watching in the first stage. As soon as they are destitute they will present themselves for relief.

Mr. Hamilton.—In the town of Sangamner (population 9,000), the weavers were the people who seemed to be the first and most severely affected. All demand for country cloth ceased, and the weavers were forced ultimately to come on to relief works, our attempts to give them employment in their own line having failed.

Mr. Bosanquet.—The weavers, who lost their employment in the famine because the people more immediately affected by it had not money to buy clothes. These persons, when much pressed, would seek to obtain employment on relief works if possible, but as they are by their previous habits unfitted for such works, it is preferable to give them the means of carrying on their own employment.

Madras.

MADRAS.

Mr. Whiteside.—In the towns, the petty artisans, and more especially weavers, brass-workers, goldsmiths, washermen, and barbers are the first to suffer. Such people depend for their support in ordinary times upon the expenditure of the more wealthy in little luxuries which are the first things that are dropped when a famine makes its appearance.

Mr. Webster.—Artisans, weavers, daily labourers, and habitual beggars. Distress among such people is manifested by an increase of alms-begging and by their wandering about the streets.

Mr. Grose.—To the labourers and beggars, as the part of the population first affected by famine, must be added for towns where they are sometimes very numerous, the recipients of small ready-money pensions. The distress shows itself by outcries and disorders in the bazaar and not by wandering in this case. Relief works on subsistence wages should be provided near the town at an early stage.

Mr. Sewell.—In towns the habitual beggars feel the effects of famine first and manifest it by their increase of numbers, poorer appearance, and greater importunity. They are a most difficult class to deal with, being vagabonds and objecting most strongly to anything like the restraint and cleanliness of a camp. Without force it is next to impossible to keep them within bounds. What they like is to get a daily dole or meal and then to wander about in hopes of picking up more. If it were possible at the commencement of a famine to seize and confine in a camp all the professional beggars, it would be comparatively easy to assist the more deserving class of petty shopkeepers, hucksters, &c., who are the next to suffer. If legislation is to be adopted to give officers greater power of control, I think the professional beggar class is the one to which it should be first applied.

Mr. Price.—As soon as famine, as such, assumes a definite form, there is, in my experience, a tendency, and a very natural one, amongst the poor classes to get rid of the task of supporting useless relatives. The consequence was that the moment that the State or charitable private individuals step in, every infirm, old, crippled, or otherwise incapacitated person was turned off by his former supporters.

Mysore.

MYSORE.

Mr. Ricketts.—The same effects are observable in the urban population as in the rural, but naturally more intensified, as many ramifications of skill and industry which give employment to numerous individuals and classes are seriously interfered with in famine time. Those thus reduced to want may best be dealt with in the first stage by relief works near their respective towns, whilst a chosen few should be helped by advances in still pursuing their former avocations.

I. II. Qn. 4.

QUESTION 4.—PROPORTION OF POPULATION SUPPORTED BY PRIVATE CHARITY.

There is a considerable number of poor and infirm persons, who in ordinary years are supported by their richer relations and friends or caste fellows, and of habitual mendicants, but who become claimants of State relief when scarcity or famine arises. What is, approximately, the proportion of this class to the total population, and at what stage do the springs of private charity begin to dry up?

Punjab.—7 replies. Estimates vary. One gives 5 per cent. Springs of charity continue open as long as there are means to supply them.

North-Western Provinces.—An approximate estimate of 5 per cent. is offered. Charity dries up as prices rise, but the mendicants are cast off before the poor and infirm relatives.

Bengal.—Some estimates are offered, but differ so much that they are of no practical value. Springs of charity do not dry up if people continue able to give.

Bombay.—8 officers have answered the question. The highest estimate of the class is given at 5 per cent. of the population. Charity dries up as prices continue to rise and reach famine rates.

Madras.—16 European and 3 Native gentlemen have replied to this question.

The proportion of persons referred to in the question who are likely to claim State relief in time of famine is variously estimated at from less than 1 to 10 per cent. of the population. The unproductive classes, according to the last census returns, are 1·17 of the adult male population, but to this must be added, for the purpose in hand, a small proportion of those who, although mainly dependent on others in ordinary times, contribute in some degree towards their own maintenance, and infirm persons and helpless children. The approximate proportion is probably about 4 per cent. of the entire population.

PUNJAB.

Punjab.

Mr. Coldstream.—My opinion is that the proportion to the total population of poor and infirm persons who in ordinary years are supported by their friends, and of habitual mendicants, is not less than 5 per cent. All very old persons, all the blind and sickly, and nearly all the lame and leprous, come under this class.

The springs of private charity necessarily dry up quickly, because they are not deep; purses are not long, and when a real pinch comes, most of these persons are assuredly in a more or less precarious and dangerous position.

Mr. Roberts.—As far as dependent relatives and caste fellows are concerned, charity is co-extensive with the means of the givers; and as long as people have anything to subsist on, they generally, to their honour be it said, share it with their belongings; but habitual mendicants, that is blind, lame, and helpless people, but excluding religious beggars, feel the pressure of scarcity almost from the very beginning and become claimants for State relief. Many wealthy *baniáhs* and shopkeepers, it is true, continue to make daily distributions of grain, but the charity of these is quite insufficient to cope with the daily increase of pauperism. In the town of Rewári I estimate this class at about 3 or 4 per cent. of the population. In other places where relief has been organized I am unable to form any estimate owing to the large numbers of applicants who have come from native states and surrounding villages.

Mr. Nicholl.—In Amritsar the proportion of habitual mendicants, poor and infirm people, to the total population of the city is about 14 per cent.

The springs of private charity begin to dry up at the commencement of the second stage.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. Plowden, Meerut.—The number of habitual mendicants is known with some approach to accuracy in each large town; and in 17 towns in this division, in each of which the population exceeds 10,000, the per-centage of beggars, *i.e.*, begging families, including men, women, and children, on the total population, was at the last census 58 per 1,000.

The whole of these persons would certainly come on the public funds.

Mr. A. Colvin.—Proportions quite unknown. Springs of charity begin drying up at a very early stage, as the need of self-preservation has become apparent.

Mr. Sandys.—The proportion is approximately 5 per cent. of the population. The springs of private charity may be said to begin to dry up when prices are higher than 12 seers of the ordinary food grains for the rupee.

Mr. Whalley, Mainpuri.—I do not think there is any stage at which the springs of private charity dry up. The stream is contracted, of course, and unequal to the demands on it, but I have never known it run dry. There is a stage at which baniyas cease to distribute food gratis, and that is when they are frightened at the crowds which collect and think their shops in danger of being looted.

Mr. Kennedy.—Private charity begins to dry up in proportion as the continuance of high prices affects domestic economy. It has been gradually decreasing throughout the last year, but from August to October 1877 it was active, and only ceased with the opening of the district poorhouse to which the natives subscribed largely.

Mr. Leeds.—No reliable statistics are available. I should estimate approximately the proportion of this class to the total population at 5 per cent.

Captain Pitcher.—The proportion of poor, infirm, and mendicants living in ordinary times on private charity must be very large. In a city like Lucknow, for instance, where the beggars are estimated at 7,000 alone, I dare say that 25,000 would fairly represent the number who cannot ordinarily provide food for themselves by work of any sort.

Mr. Stoker.—Those supported by distant relations or strangers are early turned adrift, are, in fact, among the first to go. I have no grounds for calculating the number of these classes. It is a mere conjecture when I say that I do not think they exceed 2 or 2½ per cent. of total population.

Mr. Lumsden.—I do not feel in a position to venture an opinion as to the proportion the habitual mendicant and indigent classes bear to the total population. An approximately correct opinion on such a point could only be based on a census which distinguished these classes; and even were such a census taken, the data obtained would not be altogether reliable and trustworthy. I do not, however, think that the proportion of this class to the total population can exceed seven per mille.

Mr. Lawrence.—Amongst the rural population about 20 per cent. are supported by their friends. Nearly the whole of them, together with many of their supporters, come on the State for relief when famine arises. In towns the number of people supported by their friends is very much larger (I believe 50 per cent.), but only 10 per cent. of these latter will become applicants for State relief. In a famine year the whole of the habitual mendicants come on the State.

Regarding the stage at which the springs of private charity begin to dry up, the old saying is "*solah ser tak dharm bana rahta*," *i.e.*, as long as grain is not dearer than 16 seers to the rupee, piety (or natural affection towards one's relatives) holds out. But this refers to a time when 16 seers was considered very dear. In the present day, when grain falls below 12 seers, private charity begins to dry up.

But if Government pursues the same system of poor relief that it has adopted hitherto, it will be found, with every occurrence of scarcity, that private charity will dry up at earlier and still earlier stages.

Colonel Chamier.—Habitual mendicants are cast adrift very early in the days of famine, but poor and infirm relations are supported until State relief comes to the rescue, or until private funds are exhausted. Natives of India even, in a moderately thriving condition, are kind and generous to their poor relations. Their charity is bestowed with great discrimination; at the first glance it may seem to descend to stinginess, but the givers have gauged by experience what relief is sufficient.

H. II. Qn. 4.

BENGAL.

BENGAL.

Mr. Worsley.—It is impossible to say what may be the proportion of the class here mentioned to the total population. Roughly I should be inclined to estimate it at about 1 per cent. of the population, or in round numbers 20,000.

The springs of private charity in 1874 began to dry up when the Government introduced its liberal and comprehensive system of relief.

Mr. Magrath.—The proportion according to the census taken is 1 in 200 for all Bengal; but in Tirhoot the proportions were not 1 in 600. In Monghyr the proportion is said to be 1 in 500. They do not come on relief till the majority of the local population are compelled to restrict the food they cook to the smallest quantity they can live on. Up to that time the beggars getting the surplus have not to go about for relief; they get it from their regular clients.

Mr. Marindin.—About ·27 per cent. I found the estimate upon some inquiries lately made at Buxar. I think that, if left to themselves, people able to afford it will always give, and the springs of private charity never absolutely "dry up." What happens is that the numbers to be supported become so large as to overwhelm the efforts of the charitable public, and many must consequently go unrelieved. Then if Government steps in, the public stop giving, and send those whom they have hitherto managed to support to the Government poorhouses.

Mr. Metcalfe.—I should say that about 3 per cent. of the population, who in ordinary times are supported by the charity of their neighbours, become claimants of State relief when scarcity or famine arises.

Baboo Ramani Mohan Chaudhuri.—The proportion of the beggars to the total population here is approximately 4 or 5 to 100.

BOMBAY.

BOMBAY.

Mr. Hewlett.—In the Deccan, at the time of the Census in 1872, the total population being 7,966,061, the number of persons having no ostensible independent income, beggars, paupers, &c., was 128,945, or 1·6 per cent. of population.

Mr. Spry.—It is difficult to make any accurate calculation of the numbers of decrepits and poor supported ordinarily by relations and friends, and of habitual mendicants. I think 5 per cent. may be their approximate proportion to the whole population. The springs of private charity begin to dry up when there are no immediate prospects of amelioration in the situation.

Mr. Propert.—It has been calculated that about 5 per cent. of the total population live on the charity of their friends and relations, but I cannot say on what the calculation is based. In times of scarcity, mendicants, professional and casual, increase at an alarming rate, and in the case of large towns the regular beggars are quickly supplemented by arrivals from without. We cannot say that the springs of private charity ever entirely dry up; charity really continues throughout a season of famine, but the normal handful of grain given to each applicant in favourable seasons shrinks visibly in size in hard times.

Mr. Moore.—The poor and infirm persons and mendicants, who become claimants of State relief when scarcity or famine arises, are between 1 and 2 per cent. of the total population. The springs of private charity begin to dry up as soon as the food grains reach famine prices.

Mr. Robertson.—I cannot say approximately what the proportion of poor and infirm may be to the population. It is not very large, but I am glad to say that private charity is ever watchful and kind, and that it was only when the famine became protracted, and the pressure very severe, that private charity became exhausted.

Colonel Anderson.—Infirm persons, mendicants, and such like, will be deprived of private charity as soon as it is seen that public charity is ready to support them, nothwithstanding that their relations and caste fellows might be able to support them for some time to come.

MADRAS.

MADRAS.

Mr. Whiteside.—I am of opinion that about 1 per cent. of the population of a large town are habitual mendicants, and about 4 per cent. poor and infirm. Charity is regarded by the native community as the greatest of virtues, and its practice is maintained even to a scanty extent to a very advanced stage of a period of scarcity. Not until it is thoroughly borne in upon men's minds that the famine is really serious, and the importance of self-preservation is forced upon them by stress of circumstances, do the springs of private charity completely dry up. When lately the season began to mend, and fresh grain began to come into the markets, I noticed with surprise and pleasure as soon as prices fell how the practise of charity began to revive, and I saw beggars receiving small handfuls of grain here and there.

Mr. Horsfall.—The general opinion is that about 3 per cent. of the population are more or less dependent upon the support of their richer relatives or private charity. Private charity is very extensive; it is practised daily and without ostentation. It is difficult to prescribe an exact limit for the cessation of private charity: it is inculcated as a Divine obligation. Charity to poor and infirm relations does not cease until the means of self-support cease to the person hitherto protecting. The habitual mendicant does not hesitate to seek relief both by private and State charity. At no time can the springs of private charity be said to dry up except with the inability to bestow charity.

Mr. Martin.—Approximately, as far as I can ascertain, habitual mendicants are about 2·5 per thousand; deformed, blind, and other persons physically incapable of work are 3·5 per thousand; and old, infirm dependents of families 50 per thousand; total, 56 per thousand, or 5·6 per cent. Private charity begins to fail to a certain extent the moment people become aware that the failure in the harvest is universal.

Mr. Knox.—I should say that the number of those who from age or infirmity are unable to shift for themselves would be about 10 per cent. I do not include professional beggars, but I should not think that the number of these is large, and they need not be taken into account; they are mostly able to work and, like others, would be forced to apply for relief when distress became severe.

All the large numbers of infirm persons would not however be on our hands at the commencement of distress, but only the infirm of the labouring classes and poorer cultivators. This number, though amounting to 10 or 12 per cent. of the total numbers in these classes, would not be more than about 1 per cent. of the entire population. It would not be until famine

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became so severe as to affect all classes composed of persons of only moderate means that the per-centage would much increase. It would require half the population to be on our works to make it rise to 5 per cent.

Seetharamiah.—The proportion of the class of people mentioned in this question to the total population may be approximately estimated at 6 per cent. This proportion is larger in the urban population, where the tendency and necessity to depend upon others, is greater than in village agricultural societies, who are all self-protective, except those completely unfit for work by physical unfitness. Private charity begins to dry up when the prevailing high prices begin to press the givers hard. The agricultural classes, many of whom after a fair crop followed by a total failure would have left for them surplus grain for about three months, will continue their usual charity till the greater portion of their own stock is exhausted. During the earlier stages of distress the usual charity is not discontinued all at once. The discontinuance is only gradual, and would not be felt to any perceptible extent till numbers seeking gratuitous aid become overwhelming, when alone arises the inclination to stop the usual charity altogether.

MYSORE.

Mysore.

Mr. Ricketts.—The proportion here referred to of poor and infirm persons dependent upon relations and friends, &c., and habitual mendicants, to the total population of this district may be roughly or generally given at 12 per cent., and at least half of them become claimants of State relief when famine arises. It is difficult to say at what stage the springs of private charity begin to dry up. Certain it is that such springs dry up gradually and under the pressure of a growing necessity.

QUESTION 5.—FORECAST OF CONDITION AND REQUIREMENTS OF DISTRICT.

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It is obvious that if an accurate forecast of the condition of the people during the approaching season, following any more or less serious failure of the ordinary harvest could be made by the district officer, it would be of great utility; in what way could he make it, and on what data should his calculations be based? Suppose for instance that he estimates that half the average food crop has been lost; for the support of how many people does the balance that is saved suffice? How are the rest of the people to be fed? He must form an estimate of the food stocks in the country and of the power of trade to bring in more. Supposing these two elements sufficient to supply what is wanted, there would be no famine of food. But there may be lack of money to purchase food; how is an estimate to be framed of the number of persons who would probably be able to purchase, and of the number who must be assisted by the State, either by employment which will bring them wages or by food if they cannot work? These would consist mainly of the classes indicated in questions 2, 3, 4, viz., the field labourers, the urban poor, and infirm dependents or mendicants. What numbers approximately of these classes would you expect to have on your hands if the food crops in your district failed to the extent of $\frac{1}{3}$, $\frac{1}{2}$, or $\frac{3}{4}$? and if this happened in two consecutive years.

Punjab.—3 answers are given. Some estimates are offered, but the replies rather illustrate the difficulty of making them than afford much light.

North-Western Provinces.—26 answers have been given. The possibility of making an accurate estimate of food stocks is doubted. Some conjectures as to the number of persons requiring relief are offered.

Bengal.—15 officers have answered. The majority think that the data for a useful forecast are wanting, and that this is especially the case in Bengal, on account of the absence of agricultural statistics. Estimates are given in particular cases by some officers, and also of the numbers who might come on relief.

Bombay.—10 answers have been given. The possibility of making a forecast of any practical value is doubted. So also an estimate of the numbers who may come on relief.

Madras.—14 European and 3 Native gentlemen have replied to this question.

This statement shows that where the land is held direct from Government there are available data for making a more or less accurate forecast of the condition of the people in a season following a failure of the ordinary harvest; but in zemindaries, owing to the cultivation returns not coming into the hands of the Government officers, such data are not available. Another disturbing element in making such a forecast is the improbability of estimating the extent of private stocks, regarding which the holders, whether dealers or agriculturists, maintain a jealous silence. As regards the proportion of the population likely to require assistance from the State if the food crops failed to the extent of $\frac{1}{3}$, $\frac{1}{2}$, and $\frac{3}{4}$, the evidence goes to show that one year's partial failure does not tell seriously upon the people, though a $\frac{3}{4}$ failure over a large area might bring about 7 per cent. of the population of the affected tract on to relief. If, however, the failure extends to the second year the estimate stands as follows:—

Second year.	Numbers requiring relief.
$\frac{1}{3}$ failure	7 per cent. of the population.
$\frac{1}{2}$ "	10 " " "
$\frac{3}{4}$ "	22 " " "

PUNJAB.

Punjab.

Muhammad Hayat Khan.—No doubt it would be meeting the danger half-way if an accurate forecast of the condition of the people during the approaching season following any more or less serious failure of the ordinary harvest is made by the district officer. To do this it would be necessary first to ascertain the amount of loss of the last food crop, and the distress prevailing in the country, the estimated produce of the present harvest, and the existing food stocks in the country, and the power of trade to bring in more, and then calculate how far the resources will suffice to meet the requirements of the district. In years of distress the assistant and extra-assistant commissioners should take a round in their sub-divisions, and personally ascertain the food stocks in the country, and the amount of produce of the present harvest. It is not possible to form an accurate estimate of the amount of grain that would likely be imported into the district. It all depends on the urgency and the amount of requirement of the district. The merchants as a rule take their grain to the market where it would likely obtain a ready sale, and fetch the largest amount of profit. Thus if grain be selling in the Gurdáspúr District at a very high price, the tide of commerce will turn to this district; but if, on the other hand, the demand for grain be urgent in other districts, it will take its course to those places, and instead of receiving any supply we shall lose what we already possess. A correct estimate of the out-turn of the kharif can easily be made in September, and that of *rabi* in March, nor would it be difficult to assess the grain stocks in the district. A correct account is kept by every *mahájan* of the grain stored by him, and on asking for the information it will be immediately obtained. But it will not be easy to form a conjecture what number of persons in the district, in the event of an outbreak of famine, would be able to purchase grain and what number not. It all depends upon the nature of the distress. If one-fourth of an average food crop is lost, no one, it is believed, would ask for help; the same may be said if even half is lost; but if ¾ is lost and for two successive years, then 1–10th of the population would be in need of health; but of this 9–10ths would earn their livelihood by working as labourers, and only 1–10th, that is one-hundredth part of the whole population would require gratuitous relief. If, however, the crop fails continuously for more than two years, the distress would indeed be very severe, and, excepting only the well-to-do class, the whole population will have to be fed.

Mr. Coldstream.—If in the same year both harvests failed to the extent of ⅓, I should expect to have on my hands about one per cent. of the population, or about 10,000 souls.

If in the same year both harvests failed to the extent of ½, I should expect to have on my hands 5 per cent. of the population, or nearly 50,000 souls.

If in the same year both harvests failed to the extent of ¾, I should expect to have on my hands nearly $\frac{1}{10}$ of the population, or about 90,000 souls.

This is a purely agricultural district, but it is very thickly populated.

A special inquiry into the food supply was made this year, and submitted to Commissioner with this Office, No. 290, dated 30th May last.

The result was that about ⅑ of the produce of the district is to spare for export or storage in a year of average crops, which proportion, however, is somewhat increased by imports of cheap grain from Trans-Sutlej. One-ninth produce is calculated to represent about 26,000 tons of grain. Perhaps on an average year about half of this is exported and half stored permanently in the district.

It was also discovered that the stores in the district were all but exhausted when the present spring harvest was gathered.

Mr. Benton.—The stocks in hand might theoretically be determined by actual inspection, or by collecting information regarding them; but in this country I despair of obtaining much satisfaction in this way. I suppose, therefore, that dependence must be chiefly placed on an exact knowledge of previous harvest, and on information as to the course of trades, together with a knowledge of the consumption of the people. This brings us back to preparation of correct returns of the out-turn of crops, which I have already discussed. If this were satisfactorily provided for it would dispose also of factor No. 2.

As regards the consumption of food this might be determined by actual inquiry in the locality, and the result should be verified by the import and export returns of municipalities. The decrease of consumption consequent on the rise of price would have to be duly taken into account. The 4th factor would be the most difficult to deal with satisfactorily of any, and I do not think that the district officer has at present the means at his disposal.

I would propose to deal with it in this way. Before a crop has reached maturity, when the out-turn can be accurately estimated, barring calamities, each district officer should submit a return of the out-turn of crops prepared with all possible accuracy, along with a statement of the existing stocks, and of the amount required for the consumption of the population until the next corresponding harvest, so as to show what surplus would be available for export, or what deficit required to be supplied. If the result were materially altered by calamities in harvesting a supplementary statement could be submitted showing the effect. These statements should be checked and compared by a central authority, and should then be published without any delay, together with a note by an expert, which would compare them all together and endeavour to determine what would be the prevailing prices at different dates throughout the year at all the ruling marts throughout the province.

Experience I consider to be the only safe guide in a matter like this, and judging by the light of it I should say that if the crops failed to the extent of half in two consecutive years the country would be impoverished, there would be great difficulty in realizing the revenue, but that distress would not be very apparent. My reason for saying this is that during the past year we had a failure of 2⅓ crops out of 4, and the largest number relieved on relief works was 2,419 in November last. If the *rabi* before the last had not been a partial failure I think no relief would have been called for. If, however, the crops failed to the extent of ¾ in two consecutive years we should have as nearly as possible towards the end of the period the state of affairs in the famine of 1869, when first two crops completely failed, then the third was scanty, and the fourth entirely failed. The maximum number receiving relief in any month was 12,120 relieved gratuitously, and 1,814 on relief works, out of a population for the distressed tract of 2,96,070, giving a per-centage of 4·7 instead of 12·5 as given by the Honorary Assistant. The distress ought to be somewhat less than this, as the only crop out of 4 was scanty or below average.

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Mr. Plowden.—First of all, no accurate forecast can be made by a district officer of the condition of the people of his district during the season which will follow any more or less serious failure of the ordinary harvest; and for this reason he can only judge of the condition of his own district, and has but partial knowledge of the condition of other districts, it may be near or it may be far away from his own locality; yet the circumstances of these neighbouring or distant districts may exercise a great and unforeseen influence on the food supplies of his own district.

Take the case put in the question. We will suppose a district like Cawnpore, in which half of the average food crop has been lost, and we will suppose the collector is able to say with confidence, and with good reason for his confidence, that the balance saved will support his entire population for three months. Well he has to consider the food stocks in the country apart from his district, and the power of trade to bring in additional food stocks. Admitting for the sake of argument that he is able to tell or to estimate with an approach to accuracy what is the number of persons in his district who will have means to purchase during the next six or twelve months as the case may be, and of the number who must be assisted by the State, how could he say what would be the effect of scarcity in Poona and Sholapur in sending up prices or diminishing his existing stocks, or in decreasing the number of markets open to him for the supply of food stocks required by his district, and thus completely altering the conditions on which he makes his estimate of the extent to which he can procure food stocks from outside his own district, or the extent to which his own stocks will be depleted. Yet the demand at Poona and Sholapur last year did exercise a decided influence on markets so distant from these places as the markets in the Allahabad Division.

It seems to me that the most far seeing of district officers, the collector most acquainted with the circumstances of his people, can do no more than this. He can get some idea of the number of persons who earn a precarious subsistence, and have only a day-to-day means of life, and of those who are beggars. He can also form a fair estimate of the yield of the past harvest though this is more difficult. He may perhaps, but I think that is very doubtful, go even further than this and form a fairly trustworthy estimate of the food stocks available in his district. There are so many contingencies, so many accidents, that may exert a sensible influence on the supply in his own markets, on the stocks in markets to which he might resort in case of want, and on the purchasing power of the rupee, that I do not see how, with his means of information, he can go further than this.

Anyone who has studied with care the history of prices and the evidence taken by the committees, Lords and Commons, so far back as 1833 on agricultural distress, will understand what great difficulties have to be overcome in making any accurate forecast of this nature, even in a country with extended facilities for acquiring information and for publicity like England. How much greater must be those difficulties in a country like this, where neither the sources of information are so readily accessible nor is publicity so prevalent. Who is there, in fact, who can honestly say he can really form a trustworthy estimate of food stocks in this country for any single district? I am certain that in every instance in late years where the attempt has been made to obtain an accurate estimate of food stocks either in a particular district or in a particular province it has been attended with conspicuous failure.

Look at the conflicting opinion as to the weight of an average harvest per acre in different parts of the country, or in the same district, where the estimate is made by several persons, and we can then form an opinion as to the difficulty of getting a really accurate estimate of the food stocks of the country or of any part of it.

Mr. Colvin.—Every man will do this his own way. It is useless to attempt any general answer to such a question. The data for much of such an estimate are obvious; for much again there are absolutely no reliable data, *e.g.*, the class who will claim relief, for this depends on the extent and endurance of the famine. The reply to the last paragraph cannot be given unless I am told how the food crop stood in adjoining districts or in remoter sources of supply.

Mr. Sandys.—I have no data on which to base any calculation as to the number of persons who must be assisted by the State, if a certain proportion of the crops failed and there was no food famine. Such conditions have not occurred in this district. Heretofore, when there has been such a failure in this district it has extended over so large an area of these provinces that a famine of food has followed as a necessary consequence. Up to the present time such records as exist of previous famines show that in this district complete failure of the crops has not extended to more than one out of the two harvests in the year, and that scarcity has arisen in consequence of the partial failure of the crops in two consecutive harvests.

In 1860–61 the out-turn of the autumn harvest was under half of an average year, and spring crops failed altogether. The number of persons said to have been relieved was 479,926.

In 1868–69 about a half harvest was gathered both in the autumn and in the spring, and the total number of persons relieved was 707,287.

In 1877–78 there was a complete failure of the autumn harvest and a good spring harvest. The average daily number of persons on the relief works from the time they were first started in August 1877, until they were closed in March 1878, was 2,220 (these may be classed as field labourers), and in June and July 1878 4,274; and the average daily number in the poor-house between 17th September and 16th October 1877, and 17th December 1877 to 7th April 1878, was 647 (these may be classed as the urban poor, infirm dependants, and mendicants); and in the relief camps in June and July 1878 the number was 2,017, and the daily death rate from 1st October to 30th June was 116 in excess of the rate for the same period of the previous year. These may also be put in the same class as the poorhouse population. Adding together the totals of the daily numbers on the relief works and in the poorhouse and of the excess death rate gives a gross total of 9,274, and this is approximately the number the Government would, in my opinion, have to provide for during eight months, in case of the complete failure of one crop or of one half the crops in two seasons following a harvest much below the average. If the previous harvest had been a fairly good one, no distress would I think be felt if the yield of the next kharif crop were only half as much as in an ordinary year; but if this shortness were to be succeeded by only half the usual out-turn of the rabi, then I estimate that the State would have to support 4,637 persons for three months or longer, if the prospects of the ensuing harvest were not favourable. A failure of only one-third of the crop in both harvests would not, I think, require any special measures of relief to be taken if the out-turn of the former year had been an average one. I have taken into consideration the excess mortality in the months of April, May, June, and July 1878, as well as the numbers on the relief works and camps reopened in the months of June and July, as they may be ascribed to the failure of the kharif crop.

Mr. Tracy.—The answer to the question for how many people would half the average food crop suffice must vary with the circumstances of each district. In a grain exporting district half the average crop might be enough, or more than enough, for the whole population. I am not aware of any method by which it is possible to form an estimate, as distinguished from a mere guess, of the number of persons who must be supported by the State in the event of famine. All that can safely be said on this subject appears to me to be that the collector of a district containing a large population of non-agricultural castes, such as *chamárs*, *júláhás*, and the like, who, even in seasons of plenty, breed up to the verge of the starvation, must expect that large numbers of them will come on his hands in times of distress. In districts bordering on native states he must also be prepared to provide for crowds of immigrants.

Mr. Kennedy.—This district can never suffer from an absolute lack of food, as it is penetrated by the railway, and carries on a considerable commerce with all the chief centres of trade, but in estimating the local food resources of the country two facts would have to be taken into consideration, namely, the amount of land under food crops, and secondly, the amount of grain in store. It is easy to make a rough estimate of the first. All the land under cultivation in a year of famine may be assumed to be under food grain, at least that was the actual case in this district in 1877. The amount of land under cultivation can be approximately ascertained, through the ordinary revenue agency, at the very beginning of the famine, and, as it will all be irrigated, we can assume the

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average district out-turn and obtain a sufficiently close approximation. The second element, however, namely, the amount of grain in store, could only be estimated after a long course of traffic registration.

It is possible, however, to form on general grounds a sufficiently close guess. I shall give as an illustration the calculations made for the district last year.

It was assumed that the agricultural community always retained sufficient food to support itself from one harvest to another, or say for six months. Three of these months had gone when the failure of the monsoon become decided. It was assumed therefore that there must be at least three months grain in the country.

From the registers of town exports and from the railway returns it was evident that a very much larger amount of grain than usual had been exported. This export trade was much larger than any that had previously occurred, and it was known that the town stocks were reduced as low as possible. It was therefore inferred that there could not be any large balance of grain in store throughout the country beyond the three months supply which I have already mentioned. This estimate was confirmed by consultation with landholders, grain dealers, revenue officials, and others. I now come to the verification.

I estimated in para. 3, chapter I., the maximum consumption of the district at something less than 5,500,000 maunds of grain. In a year of scarcity this will be diminished, let us say, to 5,000,000 maunds. Of this the town population will consume 800,000 maunds per head. The town population was supported entirely by imported grain, and may be left out of the calcul tion; the country population will thus consume in a year of scarcity 4,200,000 maunds per annum, and we have to calculate what stores they possessed in August 1877 for eight months till the arrival of the rabi. The consumption of these eight months will be 280,000 maunds; 82,000 acres of food grain multiplied by 11½ maunds per acre give 946,000 maunds. 175,000 maunds were exported to the district from the towns. Add supposed food stock for three months 1,050,000 maunds, and we have a total of 2,171,000 maunds, or 600,000 maunds less than the country must really have possessed, *i.e.*, the country had really four and a half months supply instead of three months supply as was supposed. At the end of March the district was largely importing food from the towns, and the grain stocks were almost wholly exhausted. We may therefore safely say that at the commencement of the monsoon this district has never had less than five months stock in hand, even in times of excessive exports. It would of course be possible to keep up a yearly calculation of these grain stocks, commencing with the figures which we have thus ascertained. But it will probably be of little value. We know, as I have showed, the minimum in one exceptional year. There is no means of ascertaining the maximum, but as the amount produced by the district exceeds its maximum consumption only by two or three lakhs of maunds, and when grain is not exported, the total maximum of food stock is probably never equivalent to more than ten months' consumption, the initial grain stock may always be assumed to be between these two estimates.

I now proceed to the second part of the question, and first I shall calculate the numbers of the classes enumerated in paras. 2, 3, and 14.

1st.—The total number of male labourers above 15 is 25,954, multiplying by 4 we have 100,000 in round figures, or the total of the labouring class inclusive of their families.

2nd.—The petty mechanics and traders entirely dependent upon the agricultural community may be estimated at 60,000. All of them are a little above the level of day labourers.

3rd.—Mendicants 10,000.

We have now to add the number of cultivators unable to bear the distress. Judging by the statistics of a large estate in the worst part of the district, I estimate that six-tenths of the cultivators could weather the year without being reduced to poverty; three-tenths more require assistance to continue their cultivation, one-tenth has died or fled. This last tenth therefore must be included in the estimate. One tenth of the agricultural class would amount to 60,000, the total number therefore requiring support is 210,000 in a year of complete failure. If a second year of failure supervened these numbers would be increased by 100,000 cultivators whom we have supposed to be on the verge of destitution. The total population of the district is 950,000, the proportion of the destitute to the whole would be 25 per cent. in the first case and 41 per cent. in the second.

Mr. Cornwall.—The proportion of field labourers thrown out of employ I should calculate at a rate somewhat in excess of the proportion of the crop failing. If one-third, one-half, or three-fourths of the crop failed I should expect to see three-eights, five-eighths, or seven-eighths of the field labourers lose their work, and if the same happened a second year the number would probably still further increase. Every working tenant would with the help of his family do as much as he could himself and prune all extra expenditure, and in the second year of distress he would redouble his efforts. Wealthy *zemindars* would be the only persons able to afford field labour, and they would probably have so much land thrown on their hands that they would be obliged to maintain a certain number of labourers; but in villages where the zemindars are poor the whole of the labourers might be expected to require State assistance.

Mr. A. Mc Webster.—I do not believe that an "accurate forecast" of the condition of the people during the approaching season following any more or less serious failure of the ordinary harvest is possible. The persons who, from the nature of their employment, the opportunities they enjoy of collecting facts bearing on the question of food supply (which is of course what regulates the condition of the people), and the large personal interest concerned, would naturally be those most likely to form an accurate forecast; but the great grain dealers themselves are often at fault, even when they have to look to market prices of a few weeks in advance for their profits, and have not to take into consideration the extremely disturbing factor of the probable out-turn of a harvest. I know of several instances in which grain dealers of large experience suffered heavy losses last autumn at Agra from a miscalculation of the food grain supply in the country. They made large purchases for a rise in prices, and in ten days afterwards a fall occurred, which continued. If men who have made grain-dealing their lifelong business, and who may be said to have inherited an aptitude for the trade, are liable to such errors in merely estimating the probable amount of the available stock of grain in the country at a given time, how is it to be expected that district officers can make an "accurate forecast" of what the condition of the people is likely to be during an approaching season? The idea is chimerical. Take the case of the rabi harvest of 1878. I venture to say that any district officer called on at the beginning of February in that year to forecast the prospects of his district during the "approaching season" would have based his calculation upon the expectation of a "bumper harvest," whereas the out-turn of the crop was not less than 50 per cent. below that of an average year. I do not think, however, that the impossibility of forming an accurate forecast of the condition of the people need prevent due and proper preparation for a famine. The district officer would naturally take into consideration the amount of the ordinary importation into his district of grain and the exportation from thence, and he might form some sort of approximate notion as to how his district was likely to be affected thereby, but this would be for the most part guesswork. I find it impossible to give definite answers to any of the clauses of this question, for it treats of a subject on which no definite knowledge is to be procured. I

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should not say that a failure of one-third or even half of a crop would necessarily throw any portion of the population on the hands of the State for relief in all cases, though perhaps a failure of two-thirds of a crop might do so.

All would depend on the circumstances of the district in which the failure occurred. For instance, a district might usually grow so much grain in excess of the wants of its population as to be able to export largely in ordinary years; in case of a failure of the crop the rise in prices would check exportation, and there might still be sufficient food for the people even with a loss of one-third or half of the ordinary crop.

Mr. Spedding.—There are so many elements of uncertainty that any forecast of the future can only be vague and liable to be shown erroneous, while the slightest change may alter the conditions in the widest degree.

There are two points regarding which an estimate has to be made—(1), is the supply of food likely to be insufficient in itself to support the population; and (2), if not, to what extent may incapacity to purchase necessitate relief?

The first point, inasmuch as it presents certain fixed basis, may perhaps be decided sufficiently for an answer in the negative or affirmative. The gross food produce may be calculated from cultivation and out-turn statistics with some success. The minimum supply of food necessary to support the known population can also be calculated. The probable loss from bad seasons would I think be best calculated on each separate kind of crop, for the rainfall may be quite sufficient to give a good out-turn of one crop, while another dies from want of moisture. Of course, any such calculation is liable to be falsified by a fall of rain or partial rains affecting one part of the district more than the others, and will render such calculations more difficult. By deducting the probable loss from the average out-turn, a probable out-turn is arrived at, and it will be seen whether this is sufficient to support the population at minimum rates. The more difficult question of export or import and of previous stores then arises. The first must depend a good deal on the circumstances of the surrounding districts, whether more or less affected by scarcity and the means of communication. Municipal returns and the price of grain may enable some idea of the latter to be formed. In this manner I think it is possible to forecast the question "will there be a food famine or not?" so as to answer in the affirmative or negative with a fair chance of success, even though no very reliable figures may be obtained.

The second point it seems almost impossible to foretell. The total numbers of such people as belong to the classes which usually come on relief works and poorhouses may be roughly deduced from the census papers. But as a given supply of food is not applied to support only that proportion of the population which it can support, but is spread over all, each person decreasing his expenses in various ways; as prices depend not only on the supply and demand, but also on the prospects of the season; as the circumstances and buying power of individuals vary largely, it seems impossible to frame any estimate in figures.

Further, numbers of people able to maintain themselves will prefer to save what they possess when by doing a slight day's work they can obtain a larger meal than usual. In short, actual previous experience would seem to offer the only means of coming to any conclusion.

In this district it seems that there have not within the present century been any food famines, and it would need an excessively abnormal rainfall to cause one.

Taking roughly the Government rates for a bare subsistence of 4 *chittacks* flour for children under 10, 8 *chittacks* for women above 10, and 10 *chittacks* for males above 10. Although this is probably considerably higher than the rates on which many people live, and is certainly not below the mark, we get the following amount of food necessary for the population of this district:—

Children under 10, 596,457 at 4 chittacks per diem or 2½ maunds per annum - - - - -	1,491,142
Women above 10, 673,142 at 8 chittacks per diem or 4½ maunds per annum - - - -	2,929,139
Males above 10, 749,751, at 10 chittacks per diem or 5½ maunds per annum - - - - -	4,123,630
	8,543,911

or about 4½ maunds per head per annum. This agrees very closely with the municipal returns in ordinary years, and as it merely considers grain, and not the quantity consumed of fruits, on which many of the poorer of the population live chiefly for several months in the year, or fish, vegetables, herbs, &c., the estimate is probably well over the mark. In the answer to question 3, chapter I., I estimate the out-turn of food grains at 20,772,000 maunds. In round numbers, then, the population can be supported by 8,000,000 maunds, and an average out-turn will be 20,000,000 maunds. Thus estimating previous stores, export and import, three-fifths of the food out-turn may be lost and still leave sufficient food to supply the population. In addition to this there is a large import of rice from Nepal. This is, however, always liable to be stopped by action of the Nepal Government, and is mostly re-exported in ordinary years.

Colonel Fisher.—In a sparsely populated and poorly cultivated district like Garhwál, there is, as a rule, very little surplus production, and hence no export of grain. If, therefore, I estimated that half the average food crop had been lost I would conclude that the people had only three months stock of food to last them for six months, and the condition of affairs would be very critical. Experience tells me it is unsafe to count on reserve food stocks. As a proof of this I would mention that the people who purchased grain from Government stores in January and February last, and repaid it in kind last June, wish to repurchase from me now in July, to enable them to carry on till the kharif is harvested, and this in spite of an exceptionally good rabi of wheat and barley last May. Instead, therefore, of calculating how many people would be fed by any balance of food in hand, I would consider it necessary to provide food for everybody, in the suppositious case above given, for at least four months. The power of trade to pour in grain at short notices in a district of 5,500 square miles covered with villages far removed from each other and inaccessible to pack animals would be extremely limited. I could only arrange for storage along main lines of road. In a country where the entire population is agricultural, money would always be procurable by the man who had a crop in the ground ripening for harvest; but of course by the field labourers, the urban poor and infirm dependents, or mendicants, money would, unless the State provided labour for those fit to work, be absolutely unprocurable. In the hills, though these classes represent but a small fraction of the entire population—certainly not more than 5 per cent., and need not cause much anxiety as to their many wants—if the food crops failed to the extent of one-third, I would expect to have on my hands about 5,400 people of this class; if half the crop failed, about 8,000; and if three-quarters failed, about 12,000. The harvest failing for two consecutive years, which is an event unknown in the history of Garhwál, would probably raise the total of these classes on my hands to about 16,000, for this figure represents all these are.

Colonel Reid.—Half the average food crop of the districts of this division would suffice for the support of the people, so far, at least, as to prevent their suffering seriously, supposing that there was no export.

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NORTH-WESTERN PROVINCES AND OUDH.

It is of course known that natives in all seasons use mangoes and mahua largely as food, and in seasons of distress roots, berries, and herbs of sorts are extensively used to eke out the small ration of grain. I believe past experience has shown that the danger of a food famine all over the empire is extremely slight; that, taking the empire as a whole, a supply of food sufficient to feed the people has always been forthcoming; and it may be assumed that when, in any district with railroads and fair internal communicacations, there is an effective demand, *i.e.*, a desire to purchase combined with the means of paying for purchases, the quantity of grain required will find its way into that district.

The difficulty will, I think, always be the lack of money to purchase food.

J. J. F. Lumsden, Rae Bareli.—I know of no better means of estimating the number of such people than by basing our calculation on the ascertained results and experience of past famines. The number receiving State relief has always varied much in different districts in a famine-stricken tract; the degree of pressure, the class of the inhabitants, and the system adopted on relief works and in poorhouses will all affect numbers seeking State relief in different districts. In answer, however, to the direct question put in the concluding sentence of the question, I may say, that with a failure of 5 annas 4 pie in the rupee in one harvest, I should not consider special relief necessary at all. An 8 annas failure would probably bring 3 to 4 per cent. of the population, and a 12 annas failure 6 to 8 per cent., on the hands of Government for relief either on public works or in poorhouses; and if a similar failure took place in two consecutive years, I believe the numbers requiring assistance would in each case be from double to treble what they were during the first year.

Mr. Harington.—As to famine of food, the power of trade to bring in food is a far more reliable basis of calculation than that of the food stock in the district. It is only as a unit going to swell the general stock of the country that district stock is of much use as a basis of calculation. It is most difficult to get at what this stock is. Every effort is made to conceal the stocks in hand and to mislead inquirers. The actual out-turn being calculated, the amount exported is at present an unknown quantity. In this district the problem almost confines itself to the means of getting the people money to purchase food. This done, the trade will, in any set of circumstances at all likely to arise, do the rest. There is not likely to be a food famine so long as there is money to buy it. But increasing exports will inevitably cause a general rise of prices; great quantities of grain formerly available for local consumption will leave the district; and until a corresponding rise in wages takes place the labouring population may be subjected to both food and labour famine. A labour famine will occur in every year of scarcity. Its extent can scarcely be predicted on present data. *A two years consecutive failure of both the kharif and rabi* crops to the extent of three-fourths, or even of half, might be expected to bring half, three-fourths, or indeed the *whole* population of field labourers, urban poor, and infirm dependents and mendicants on the hands of the State. Such failure is practically out of the question; could it occur, not 600,000 out of the 1,000,000 of this district would escape without assistance; not one of the classes named. As a fact, a bad *kharif* is likely to be followed by a fair *rabi*; in which case a failure of one-third is not likely to bring 15,000 on the hands of the State.

Half might bring some	-	20,000
Of two-thirds	- -	50,000

These numbers would be at least doubled if a second failure of the kharif followed. A failure of the intermediate *rabi* might be expected to include the whole of the classes named, and most of the poorer agriculturists besides. The total numbers seeking relief would then probably not be less than from 500,000 to 750,000.

Mr. Quinn.—I place little reliance on figures professing to give the food stocks in a district. I do not believe that an estimate, even approximately accurate, can be made, and calculations as to the length and severity of distress based on such data are sure to prove most delusive. The data which can be ascertained with considerable accuracy, and from which sufficiently accurate conclusions can be drawn, are the amount of food crop lost, that is to say, the actual out-turn as compared with the average out-turn; the class and proportion of the population, who live wholly or in part on these food grains; whether they live on them during the whole year, or only during certain months; whether, failing these food grains, other cheap food is procurable; whether the district ordinarily produces more or less of these food grains than it consumes; whether this export or import will probably continue; whether the preceding years have been bad or good ones; what is the prospect of the ensuing season; what is the normal condition of the people. To ascertain the amount of grain held in stock by cultivators and dealers is quite as impossible as to ascertain their profits. Everyone tries to mislead, the authorities. The attempt is likly to create a panic, and those conducting the inquiry find ample opportunity for extortion. Supposing, however, that a fairly accurate return has been obtained it may be soon rendered useless by unforeseen circumstances. Where a district is well supplied with communications, especially railway communications, export and import are affected by the prices ruling in distant grain depôts. Last year Oudh export fluctuated with prices at Benares, Calcutta, and Bombay. The stock may also be largely reduced by grain withdrawn for seed. Last year our return of food stocks had only just been completed when an abundant rain fell, the result being that instead of *rabi* being sown in only about one-third of the ordinary area the area actually sown was fully half more than usual. Our stock return then, whatever its previous value, became utterly useless, unless supplemented with an estimate of the amount of food grain withdrawn as seed.

The measures I adopted were to open poorhouses at each of the tahsíli towns. This secured the supervision of a tahsíldar and hospital assistant. Municipal works sanctioned in the budget were taken in hand, and additional works projected; the district engineer was instructed as a tentative measure to take on at a low wage all who applied for employment on a few selected district works. When it was found that people flocked to these works, notwithstanding the low wage, and that many came from a distance, a few regular relief works were opened. This system of only extending relief works as the necessity for them was proved worked well. The class who apply for work, their physical condition, the proportion to the whole borne by men, women, and children, and the distance the applicants have come from, require to be all carefully watched. As long as it is possible, I prefer that the people should be given work within a reasonable distance of their homes, and have at least the option of returning to them at night. When famine increases in severity large works must be set on foot, and this requires the assemblage of workmen in large bodies. To these works I should draft off the able-bodied men and women, under the inducement of a higher wage, leaving the weak and infirm, and those encumbered with families to be employed on petty works near their homes; but as regards an absolute rule that all relief labourers are to be employed in large bodies and to be hutted, it should be borne in mind that huts are built for those who leave homes of their own; that the sick, the old, the infirm, and young children, have all to be dragged to long distances from their homes, or else a special and expensive village organization has to be made for their maintenance and attendance, during the absence of their natural sup-

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North-Western Provinces and Oudh.

porters, and that camps if epidemics are to be guarded against require special sanitary arrangements and medical supervision. I do not think it would be wise to incur all this expense, and to put the people to so much hardship, simply to secure a test that those relieved were really in want. The special works to be opened should be selected by the district officer in consultation with the district engineer. All relief works should be under the Public Works Department, and the head of the district should be generally responsible.

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Mr. Barlow.—In the province of Behar we are absolutely without the data necessary for making an accurate forecast regarding the food supply. All the districts are permanently settled, and we are deprived of the information obtained under the tahsildari system of the North-Western Provinces, or the ryotwari system of Madras. Our general survey, which is 30 years old, supplied in certain cases only the total amount of land cultivated and culturable, as distinguished from waste, and without detail regarding crops. We know nothing about the advance made in cultivation, nor can we say how the land is distributed under the different kinds of crops, and what is the amount of produce. It is truth, therefore, to say that the "average food crop" here is an unknown quantity.

It seems to me that little is to be gained by guessing at the proportion of the population likely to come upon the hands of Government under given conditions in regard to the failure of crops. The only kind of information that would furnish a fair basis for a calculation in this direction would be the details as to castes, general circumstances, and numbers of persons who, during previous famines, have accepted relief in food and money. These, again, should be compared with well ascertained particulars respecting the extent of crop failure and the course of the distress that followed it.

According to the system upon which we worked in 1873–74, inquiries with a view to action to avoid famine were made early, and before the physical condition of the people would be likely to show much effect from the failure of the food supply. The declared policy of Government that famine is to be met and relief undertaken before the population is brought into a generally reduced condition will, in the view I have taken, tend rather to confirm the position that in making a forecast for an anticipated season of distress, we base our judgment upon the fact of failure of the food crop, and conclusions drawn therefrom, and not upon any ascertained facts with regard to the state of the people themselves. I do not say that this can be easily avoided; but it tends to increase the chance of mistakes being made, and may help to account for them when they are made. Under the system of what I may call working downwards to distress, the district officer has ample and quick notice of apprehended misfortune. Personal communications with, or reports from, police officers and others tell him that the crops have failed, and the poor must suffer, almost before it has been decided that, according to the rain-fall, the season has been irregular. I may mention that, during the last few years, the annual outcry that the season has been abnormal and is likely to prove disastrous has become a regular habit. These warnings are listened to with more or less attention, as the general appearance of things is felt to be threatening; and the information obtained is tested as far as possible by the personal observation of the district officer and his subordinates, who, if necessary, take care to examine the state of the crops before they are taken off the ground. Government having undertaken to protect the people from famine, there can be now but little chance of any reasonable alarm escaping the notice of the district officer. Real difficulty commences when the district officer, having finally resolved that distress is coming, proceeds to determine the precise character of the same and the action that must be taken, and to this end attempts to guess at the number of people likely to require relief upon the basis of the proportion of crops lost. I wish that a method could be devised whereby the ascertained condition of the people and the number likely, according to their habit of life, to become pauperized, even if this be worked out for limited tracts only, might form a clearer element in the calculation.

A district officer would, I suppose, judge whether distress is due to temporary or local scarcity, or likely to be the forerunner, of very general severe distress ending in famine, by observing the extent of failure of crops and the range of prices in his own district and elsewhere. He would also consider whether the last year or two had been years of plenty or otherwise, the state of stocks, trade, &c. As regards the state of crops and prices, I think that existing means are sufficient for keeping officers informed of what is going on; what with weekly notifications in the "Gazette," newspaper reports, and communications (personal) between officers, and, lastly, the action of Government itself early in the season, when times become very threatening. The state of stocks and trade under the Bengal system is a knowledge to which the district officer cannot obtain. Government are collecting statistics of river trade at registering stations, and they receive the railway traffic returns. These may be conveniently supplied to local officers as soon as a means has been devised whereby they may know something about the produce of their districts, but not beforehand.

Colonel Burn.—Generally speaking, half a food crop will about suffice to feed the population where food crops predominate, and where other grain exceeds food grain, the price of it will have about the same effect, on importations, if food grain can be imported. I do not consider any State relief would be necessary if only one-third of food crops failed; if half failed, half the field labourers and urban population would require some help; if three-fourths of crop failed, three-fourths of field labourers and urban population and all infirm mendicants.

Mr. Worsley.—My belief is that all famines in Behar are occasioned by drought, and that the only classes of the people which should be extensively relieved or assisted by the Government are the agriculturists and field labourers. In making a forecast of the condition of the people during an approaching season of scarcity or famine, I should ascertain by a village to village inquiry what proportion of the crops had failed in each village. I should consider the quality of the three previous harvests and the probabilities of reserve stocks being larger or smaller than they would ordinarily be supposed to be at the particular season of the year. I should assume an average out-turn of grain per beegha for ordinary years, and calculate the probable out-turn in maunds of the harvest that had failed and the probable out-turn of the next following harvest. Adding these quantities to the reserve stock, I should calculate what proportion of the whole population the total stores would maintain until the reaping of the *bhadoi* harvest at an average daily rate of three-fourths seer per head of the population. If there appeared likely to be a considerable deficiency of food, and there were little prospects of prices being kept low by importations, I should recommend that *provisional* arrangements be made for relieving (for the ascertained

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period), by a joint system of advances and relief works, that proportion of the population for whose support local supplies would not suffice. The majority of the queries contained in question 5 cannot be answered from my own actual experience, and I think it well to express my opinion that conjectural estimates are simply useless. In 1874, Seetamurhee sub-division suffered famine from failures of harvests scarcely more extensive than the failures which occurred in 1875–76. In the latter year, owing to large importations of food (some 15 lakhs of maunds being imported to the district), very low prices and an excellent mango season, the people of Seetamurhee sub-division managed to support themselves without any assistance from the Government. In 1875–76 the out-turns of the three harvests in that sub-division were *bhadoi* 8 annas, *aghani* 5 annas, and *rabi* 8 annas. The out-turn of the *aghani* harvest was ascertained by a village to village inquiry made by selected native officers and by myself. On 15th December 1875, I estimated that 152,300 persons of the agricultural and labouring classes would require assistance for three or four months in 1876, and that 5,000 paupers would require charitable relief; but, as I have already stated, a combination of favourable circumstances subsequently upset all my calculations. Last winter the rice crop (the principal harvest in Seetamurhee sub-division) failed in the sub-division to the extent of nearly two-thirds, and was followed by a 10-anna rabi crop, but importations and an unusually fine mango season have again enabled the people to subsist on their own resources. Considerable privations have been undergone no doubt, bnt still no instances of starvation have occurred. I presume that so long as failures of crops are not very extensive or general, and there is no fear of a general famine, the borrowing powers and credit of the lower classes will stand them instead. The peasantry, however, from the accumulated pressure of debts, and from their want of tenant rights, must always remain under the existing state of the rent law in a very low condition.

Mr. Magrath.—No accurate forecast can be made, nor, supposing the crop be estimated correctly, which it cannot be till just before it is cut (hail, blight, insects, and floods being all possibly destructive influences), the extent to which exportation may take place is a factor which the district officer has no means of calculating. This he cannot tell until he knows what the people into whose hands the grain has fallen will do with it: they may export a great part of it, trusting to buy cheaper hereafter; they may have to part with it to mahajans who will hoard it for a rise or send it elsewhere; they may have to advance it to their labourers to keep them going till next crop. This, if there is a prospect of the next crop being good, is what they probably will do. Nothing but the roughest calculation can be made, and the holders of the grain can upset that calculation at any moment by the course they happen to take.

It entirely depends on the capabilities of the country. If it is a rich country where stores are kept, it will be sufficient to give work and wages for that work to the poor and trust to traders to import. If the country though poor has large dealers, Government by giving traders advances and starting work for the poor could supply the want; but if as in Madhubanni there were no traders, Government must import and sell as well as pay wages. The estimate of stocks is always very difficult, nay, anything like an accurate estimate is impossible. The very vaguest estimate only can be made. The power of the trade to bring in more is always easily estimated. If you have big traders in a large way they can always, if furnished with money at low interest, provide any quantity of grain if given sufficient time. The estimate of the number of persons who will come on the State for relief can be roughly estimated from the census list of castes (the tables of occupation are nearly if not entirely useless). Anyone acquainted with the district would be able to pick out the poor castes, and those who mainly form the classes of labourers without land or other means, and the artizans who will be without means, and according to the apparent severity of distress how large a proportion of mendicants will come to the State. In no case will they all come; a proportion even in the worst times being supported by the rich. Thus in Madhubanni I calculated that about two-thirds of the population would be eventually on relief, and that it would not be safe to calculate for less than an average of half the population during the months which must elapse before a fresh crop would come in. As a matter of fact the numbers on relief rose out of a population of less than 700,000 to more than 500,000, and from March to July, when advances were made to enable the fields to be cultivated, the numbers never fell to 200,000.

The estimate should always allow a margin, as was clearly shown by the fact that in 1874 three days delay in the fall of the rain would have ruined the rice, maruá, and janerá crops, and prolonged the famines till January or February. If one-fourth of the crop remained in any district that I have yet visited it would suffice to support the people though on scarcity rations; provided there were no exportation, I should expect to see 20 per cent. of the number of labourers and poor artizans and the same number of the beggars on State relief but not more. Of course, if as was the case in Madhubanni a large portion of the small crop was sold elsewhere, the conditions would be entirely changed. If this continued for a second year, the whole of the urban and rural labourers would be on relief, as the farmers would not have the grain to pay their labourers with, and the bulk of the beggars would also come on relief.

Mr. Hodgkinson.—It is impossible in a report of this kind to enter at length into all the contingencies which may arise. I will, therefore, confine myself to those which depend upon the condition and circumstances of the district crops only. If the bhadoi is a good crop and the rice fails, there will not be general, but somewhat severe local distress in rice tracts during December, January, and February, until the rabi crops are reaped, and perhaps also in May and June. If the bhadoi is an average crop, and the rice half an average crop, I do not look for any remarkable distress, provided the rabi crop is a good one. If the bhadoi is only three-fourths of an average crop and the rice crop a fair one, there will similarly be no scarcity, though in places there will be pressure in October and November. If the bhadoi is half an average crop, only relief works will have to be specially started in October and November to continue until the rabi is cut, if the rabi harvest is a good one. If the rabi harvest is also a bad one, one-tenth of the population will be on our hands in April, May, and June. With less than half an average yield of bhadoi, unless the promise of the rice is very good, we shall approach a famine very nearly in October and November. The rabi crops will have to be very good indeed to prevent a far worse state of things than occurred in 1874.

Mr. Toynbee.—This seems to me the most important of all the questions in the series, and to involve, if it could be answered fully, the solution of every difficulty, except the financial. For the purposes of an *accurate* forecast it is clear that such figures as are used as the basis for such a forecast *must* themselves be accurate, and quite beyond the range of guess work and doubt. A district officer to make such a forecast,—(1) should *know, not* guess, the exact amount and nature of the food grain grown in, exported from, and imported into the district year by year; (2) the population, and their actual average consumption per head being accurately known, a *reliable* estimate of stocks in hand would thus be arrived at; (3) the estimate of production in the year of failure which must be more or less guess work (and which the people themselves would exaggerate as much as possible), plus that of the stocks in hand, would give the district officer a fairly safe guide as to the amount of grain in his district. But unfortunately a district officer in Bengal has no means of getting at any reliable figures whatever; the population as counted during the Census of 1872, is known with something like accuracy; but as it was not a census taken for the special purpose of famine administration many important details are wanting. He has no means of ascertaining the actual out-turn of any given harvest, he can only guess at it. There is no organized system of inter-district traffic registration, and it is therefore impossible even to guess what grain goes out and what comes in. If there be a railway running through the district, the difficulty is considerably less, as the traffic returns form a good general index to the exports and imports of the district. I should therefore say that, not having sufficient data for reducing his prognostications of distress to tabular forms and figured statements, a district officer would be wise in his generation if he confined himself to acting on the general, and almost intuitive knowledge which every officer has who moves about freely among the people. The conditons of each district in Bengal vary so much, there are so many local peculiarities in each, so many extraneous circumstances which affect the question of the distress in any particular locality, that it is impossible to lay down any fixed rule or course of action for any district. What a district officer should do, if scarcity threatened his district, would, in my opinion, be this:—He would make over the current duties of his office to his joint magistrate or some other senior officer, and move freely about among the people, watching the state of prices, the movements of grain along the principal traffic lines, the general condition of the people, and especially of those coming to the works which he would at once open from road cess funds. If there was no trade or private enterprise, he would arrange for the supply of a small reserve stock of grain at some central and accessible place, and so on. He would instruct his sub-divisional officers to do the same. A district officer in time of famine is somewhat in the position of a general arranging beforehand the plan of a military campaign, he has to change his tactics with every change of move on the part of the enemy. He can fairly well arrange the outlines and principles of the campaign, but not its details.

Mr. O'Donnell.—I should not attempt an estimate of food stocks with the present means of collecting information. I would not feel justified in forwarding an irresponsible guess to the Government; yet what more accurate is now possible. I remember in 1874 the Collector of Tirhoot and one of his sub-divisional officers differed on this point in the proportion of seven to one. Perhaps the very greatest service that the Famine Commission could do is to press, with almost any strength of language, the necessity in Bengal of agricultural statistics, locally and continuously compiled.

The last part of the above question runs thus,—"What numbers of these classes (field labourers, urban poor, and infirm dependents) approximately would you expect to have on your hands, if the food crops in your districts failed to the extent of one-third, half, or three-fourths? and if this happened in two consecutive years." I simply cannot attempt an approximation. These numbers would depend on an infinite number of circumstances, which it is now impossible to predicate. In considering the case of Sarun, one should also want to know the condition of Chumparun and Goruckpore, whence it draws much of its food supply in certain years. Does the question mean that some one crop, which in itself constitutes a third or half the entire food supply, totally failed, or is the third or half to be taken out of each crop, or all the crops? This difference between these two conditions would be immense in the present year in Sarun. If even one-third of the total food supply of the year were now cut out of the *bhadoi*, I believe not only the above-mentioned classes, but crowds of small farmers, would want abundant relief. The district, however, could stand a loss of one-third of all the crops of the year, if the *bhadoi* were generally secured. It would also make a great difference as to the time the failure occurred—a failure of the *rabi* for instance, if severe, would in all years result in the greatest distress, because the period from the harvesting of the *kharif* to the reaping of the bhadoi is so long. In fact suppositional questions, in which only one out of a dozen possible accidents is given, cannot be answered with even a very limited accuracy. At the same time, I may record my opinion that a failure of three-fourths of the crops in Sarun is so entirely improbable that it need not be considered; and that not only in Sarun, but in the whole of Behar, both north and south, no famine, or distress approaching famine, has resulted, except after two consecutive years of failure of crops.

Mr. Finucane.—If I were to form any estimate of old food stocks on *à priori* reasoning, I would assume,—

First.—That the population could make their ordinary arrangements for subsistence up to the time of reaping the crop of serious failure.

Second.—That, foreseeing the approaching failure for some months before the new crop is reaped, merchants and others would keep in reserve some stocks, which (were it not for such failure) would ordinarily be thrown into the market or exported during the month of impending and foreseen failure, that from motives of prudent forethought consumption would be also lessened during those months, and that the savings from these two sources would be probably sufficient to maintain the population for two months after the reaping of the new crop.

Third.—I would next add to the quantity represented by two months supply the produce of the crops which partially failed, and would then consider how far this quantity sufficed for the requirements of the population during the interval between the reaping of the short crop and the reaping of the next food supplying crop. Whether the supply which I have put down at two months would in any given case suffice to maintain the population for one or two, or for how many months, is a question the solution of which could be guessed at by people of local knowledge, and ascertained by inquiry from merchants at the chief trade centres of the district, and from house-to-house inquiries from ryots in selected specimen areas. I now propose to take concrete examples in the Dinagepore District and in the two northern subdivisions of Durbhunga, and apply the above method, adopting Mr. MacDonnell's figures as to areas and population. In both these districts, but especially in the former, winter rice is the chief crop, and the staple food of the people. On this crop (or its proceeds) the population subsists from the beginning of January to the end of August. In August the bhadoi crop is reaped. This crop may not in ordinary years be quite sufficient to support the population from the time it is harvested, to the cutting of the next winter rice crop, but experience has shown that in years when the great winter rice crop fails, a larger area than usual is sown under the bhadoi crop, the produce of which in such years may be assumed sufficient to support the population from and after the 15th of August to the reaping of the next rice crop. Assuming, then, that the ordinary food supplies of 1873 were sufficient to maintain the population up to the middle of January, that two months supply in addition (consisting partly of savings in ordinary consumption during the previous four months, and partly of reserve stocks which, were it not for such failure would have been exported) was also available from the stocks of 1873 the ordinary food supply of 1873 would last till 15th March. To meet the local consumption of the five months 15th March to 31st of August there would be the produce of the rice crop reaped in December and of the rabi reaped in March and April. It is there-

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fore only necessary to see how far that supply is sufficient for the five and a half months.

The following statement shows the deficit calculated on this basis:—

Name of District.	Proportion of principal Crop of serious failure in 1873 to ordinary out-turn of such Crops.	Total cultivated Area in Acres.	Annual Food Out-turn.	Annual Consumption in round numbers.	Monthly Consumption in round numbers.	Requirements for five and a half Months, *i.e.*, from 15th March to 31st of August.	To meet Requirements of these Five and a Half Months.			Difference between 7 and 10 columns, being deficit.	Quantity of Government Rice imported.	Quantity imported by private Trade.	Actual Quantity of Government Grain disposed of.	Remarks.
							Winter's Rice Crop of 1873–74.	Rabi Dry Season Crops.	Total.					
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
		Acres.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.					I take no account of seed stocks, because they would be kept over and above the two months supply which I assume is saved from old stocks. The "two months supply" is of course a purely empirical quantity which would have to be ascertained by local inquiry in each case.
Dinagepore	4annas or $\frac{4}{16}$	1,688,177	Winter rice - 498,000 Others 86,000 584,000	326,000	28,000	154,000	124,462	1,452	125,914	28,086	39,674	Nil	31,513	
Durbhunga, Madhubani, and Sudder sub-divisions	$\frac{3}{16}$ $\frac{2}{16}$	1,254,980	Winter rice - 425,000 Others 243,000 668,000	414,000	34,500	181,125	86,756	25,000	111,757	69,369	115,906	Nil	77,156	

From these data and calculations, the following conclusions are suggested:—

First.—That in food exporting districts in which winter rice is the chief crop and main food staple (the failure of which crop alone can cause serious scarcity in such districts) it may be assumed that the population can subsist on the produce of the previous year's crops at least up to the middle of January. Supposing the bhadoi next preceding the winter rice of serious failure to be an average crop. This is obviously the case, and supposing the bhadoi a failure, it is none the less the case, because the bhadoi can be an absolute failure only in case of there being no rain right through from June to August, and can only be a serious failure in case the deficient rain-fall occurs at time of ripening of the crop, *i.e.*, in July and beginning of August: in either of which contingencies people are forewarned and reserve stocks ordinarily intended for export. In the district of Dinagepore and the north-east of Durbhunga the rabi food supply being insignificant, the failure of the rabi may also be practically disregarded in considering the food supply available at the time of harvesting the winter rice.

Second.—It may also be assumed when the winter rice crop seriously fails in a district of this class that a supply would be forthcoming from the stocks of the preceding year, sufficient to maintain the population for some time after the winter rice harvest. The exact length of time can only be ascertained by local inquiry in each case. The experience of 1874 showed that this time was two months in certain districts; but the conclusion that two months supply from old stocks may be expected in any future case though suggested is not warranted even for those districts.

Third.—That owing to extension of area sown under the bhadoi crops next succeeding the rice crop which failed, the proceeds of the bhadoi will be sufficient to maintain the population from, say, the end of August to the reaping of the next winter rice crop.

Fourth.—That, therefore, in the case supposed (which is the ordinary one) it is only necessary to consider how far the out-turn of the short rice crop suffices to maintain the population for five and a half months.

Fifth.—That in Dinagepore a five-anna winter rice crop suffices for this purpose, and that in Durbhunga a six-anna rice crop supplemented by an ordinary rabi crop would suffice. These results tally with the statements of persons possessed of local knowledge. Assuming the bhadoi succeeding the short rice crop also failed, then the deficit, as worked out in the table, would be increased by the requirements of local consumption for the interval between the harvest time of the bhadoi (say middle of August) and the harvest time of the next winter rice, say beginning of January; and if this winter rice crop again failed, and the failure were very serious, the results would be disastrous and the deficit enormous.

It is unnecessary to pursue the inquiry further in order to quantify deficit. In a district the chief food products of which are rabi crops (wheat, oats, &c.), I would follow the same system in framing an estimate, with this difference that, instead of making my starting point the harvesting of the rice crop, I would concentrate my attention on the rabi, and consider how far the short out-turn of that crop was sufficient to feed the population during the interval between the reaping of the rabi and the reaping of the next good supplying crop. As, however, I have little knowledge of such districts, I refrain from making any such calculations. Supposing private trade equal to the task of importing the quantity necessary to make up the deficit, the maximum expenditure on the part of the State would evidently be the price of that quantity. The State expenditure need only equal the price of the deficit quantity in the extreme case where none of the consumers of the imported grain were able to purchase without State aid. The minimum State expenditure would be where the people were so prosperous that all could purchase from previous savings. The necessary State expenditure may vary, therefore, from nothing at all up to the total price of the deficit quantity of food. What the amount of expenditure within these limits, and what the number of persons may be who would require State aid to enable them to purchase food in case of serious failure in any given district, are questions the answers to which depend so much on the comparative wealth of the cultivating classes, the heaviness or otherwise of prevailing rent rates, the leniency or the reverse of zemindars in realizing their rents in the year of scarcity, and on numberless varying local circumstances of the kind, that I think estimates based on the assumption that certain classes will require State relief, or on similar data derived from census returns showing the number of those classes, cannot be relied upon. The only guide I can see in these matters is the actual experienced results of past famines, which, at best, is but a rough guide.

The following tables show the proportion the numbers who received State aid bore to the total population in the circle of which I had charge—Patiram Circle, Dinagepore District:—

		Per-centage on total.
Total population	66,866	100
(*a*.) Highest number at any time on relief roads	8,000	12·1
(*b*.) Highest number on gratuitous relief	2,608	3·9
(*c*.) Highest number on semi-gratuitous relief	1,806	2·6
Total of (*a*), (*b*), and (*c*), being highest number receiving State relief direct	12,414	18·6

The 12 per cent. included in (*a*) does not, of course, represent the real number of persons who received State aid to enable them to purchase food. The female members of the relief labourers families, as well as young children who did not come on the works, must be also taken into account. It would therefore seem that about 30 per cent. of the population received State assistance exclusive of those who received indirect aid by being enabled, in consequence of Government importations, to purchase food at lower rates than would have otherwise prevailed. I should think no State relief would be necessary in Durbhunga or Dinagepore if the winter rice yielded an eight-anna crop or more. Little relief would be required if the winter rice yielded a six-anna ($\frac{6}{16}$) of an average crop, provided zemindars were prohibited from realizing rents in such years. The case of the food crops yielding only a four-anna (one-fourth on average) crop, or less, being that of 1874, has been already discussed. Mr. MacDonnell's method of figured estimates has been objected to, *firstly*, on the score that the calculations are beyond the power of the human intellect; and *secondly*, on the score that the method is in itself logically vicious. It seems to me that the calculations are simple, provided the necessary data are available, and that it is not beyond the power of Government to make them available. The method appears to me to be the deductive method verified by the results of specific experience, which is precisely the logical method prescribed for all inquires into social phenomena by so great a logician as John Stuart Mill. Moreover, the objections made to the method are objections to the possibility of framing any estimate at all on any method, and are of little force unless it be maintained that the district officer should attempt no forecast of the food requirements of his district, but merely wait and let things take their course.

Mr. Metcalfe. — The great lesson learnt in the famine of 1874 was that the lines of internal trade in India are so marked; and in the absence of railways trade is so dependent upon river communication, and river communications so dependent upon seasonable rainfalls, that a district which for a number of years has always been an exporting district will suffer very great straits from scarcity of food before the direction of trade will turn and convert an export into an import trade. When the rivers are dried up it becomes impossible to convey grain into the interior, except by land carriage which would eat up all profit.

As a general answer to the question put, without entering into minute particulars, I should say, if half the average food crop of a district was lost, and the district was an exporting district, that there would be quite sufficient in that district for its requirements, presuming that the district yielded two crops in the course of the year.

I should assume that there is always a one-year supply of grain stored in a district. The habits of natives are so stereotyped, that I should assume that, under the conditions of a drought for two consecutive years, the mahajuns would, in the case of a district difficulty of access, either wholly close up their stores or issue grain at famine rates only.

To the question how an estimate is to be framed of the number of persons who in a year of scarcity would probably be able to purchase food, and of the number who must be assisted by the State, it would probably be an approximately accurate calculation to assume that two-thirds of the population of an ordinary agricultural village would not be able to purchase food, and that one-third would. But there would be found villages in which the whole population would be able to purchase food. It would be, in my opinion, safer to estimate for the quantity of food required for the whole population of the famine-stricken tract than for the number of people who are likely to require to purchase it; and in addition to this, allowance must be made for outsiders, for this reason that famine and relief works invariably attract people from neigbouring districts, and the local population is thus largely increased by people who really do not belong to the district; even if the rate of wages is so low as not to render it worth their while to stay, yet numbers of people will probably have entered the district and increased the population before the rate of wages fixed by Government becomes known.

Mr. Kirkwood.—Calculations as to the extent of relief which will be required must not be built solely upon the extent of the failure of the crop. The extent of the assured failure must be read with a certain reference to the rise in prices and to the classes of persons seeking relief. Given a partial failure of crops, a famine need not ensue if the crops in the neighbouring districts are good and communications are easy. When a district is ordinarily a surplus producing district, the district officer must inquire first of all what proportion of the usual average crop is kept for consumption. He must deduct the larger portion of his ordinary exports from the average outturn of his crop; he must bear in mind whether from any cause, such as excessive export or from scarcity, his district supplies have been already in part depleted. If thus calculating he can regard the stock which this harvest will leave for local consumption as being three-fourths of the stocks consumed locally in an ordinary year, and the neighbouring districts are not worse off, he may conclude that though here and there a small expenditure will be required to meet distress there will be no starvation. If much less than this is available, he must apprehend a severe scarcity, but one which will probably be met by money expended on works, and, if there are facilities for communication with more prosperous parts, without any Government importation of grain. But if only half the stocks ordinarily available for consumption are likely to be available, and even before that if prices lend a gloomy interpretation to the failure, and of course when the probability is that there will be available for consumption only one-fourth of the stock ordinarily available, Government should, in my opinion, import grain and store it in the more distressed and remote parts—small stores at first, if there are great facilities for importation and there are elsewhere crops readily available, and larger stores in proportion as those remedial influences are less apparent. The object of Government in making such imports should be to keep the price of grain in the distressed parts from passing a fixed high price, which limit should, I think, be three times the ordinary price in a prosperous year.

Government will find it more necessary to import into an ordinary surplus producing district than into one which ordinarily imports a portion of the food required for consumption, because export operations are not readily converted into import ones, whereas existing import operations can generally be easily expanded. It will be long before private import operations percolate into the more remote parts of an ordinarily exporting district. It is there that in ordinary years prices are lowest: it is there that in years of famine prices rise highest. It is not only the actual failure of crop, or the actual dearness of food, which must be considered, but the proportion which that dearness bears to ordinary prices must also be taken into account in gauging the distress.

The district officer thus armed with necessary information, and ready at all points for the crisis, should probably gauge the actual extent to which relief will be required more by the prices prevailing after the temporary lull occasioned by the reaping of a scanty harvest is over, and by the classes seeking for relief than by any other circumstances. When those who are known to have some amount of cultivation and are not purely hired labourers begin to seek for relief, he may be sure that bad times are at hand. But his preliminary arrangements before the reaping of the harvest may thus be summarised.—Where there is only a one-third failure assured he need take no steps, but about April and May should be on the look-out for occasional cases of distress; where there is a half failure assured, he may be sure that he will have to take earlier and more vigorous measures, and he should without loss of time have a limited amount of grain (purchased elsewhere and imported) stored in the more remote parts. With an assured failure of three-fourths of the crop, he should commence at once to pave the way for extensive relief operations. A village inspection should be set on foot in November (if the main crop, which has failed, is harvested in December and January), the names of all those actually needing relief, or likely to need it, should be entered in three or four categories according to the method of relief which may be deemed suitable for their cases, *i.e.*, by earthwork as able-bodied labourers, by earthwork as light labourers, by spinning, by weaving, by gratuitous relief. The date from which the relief would probably be required should in each case be stated. Useful works should be at once opened in many parts of the district, establishments not large at first, but capable of ready expansion, should be entertained, a separate account department should be organized, local committees should be formed, private charity should be stimulated, and a considerable amount of imported Government grain should be stored in the more remote parts.

In my opinion Government should so act that in no famine should prices ever be higher than three times the ordinary rate. How and why this should be done will be explained in the proper place, and in replying to questions 33 and 39 in chapter III. With prices kept at that figure, if the failure is over any considerable area and extends to three-fourths of the crop, I should expect at the worst time to have about 16 per cent. of the affected population on my hands for relief. That per-centage might easily swell to 50 per cent. unless prices are thus restrained. I do not mean that 50 per cent. of the population over any large area will actually be receiving relief; many will die who would otherwise have lived. Thus in Kaladgi District (1877), where prices rose in the marts to six and eight times those ordinarily current (and, therefore, higher still in the remote parts), the highest number relieved was only 17 per cent. of the population, while the Census taken in 1878 points to a conclusion that 20 per cent. of the population of 1876 were missing. Many more than 16 per cent. of the population will actually partake in the relief given to a daily average of that proportion. For women and children all to some extent partake in the wages of their male relatives, field work will be done one day and the relief works attended to the next, and so on.

Baboo Hari Mohan Chandra.—I was a relief officer in this district in 1874. At the first stage of the famine I gave the applicants work close to their homes; but when the works close to their homes were finished, and the number of applicants increased with the increase of the distress, I opened works at 12 or 15 miles distant from their homes, where they went without reluctance and worked. No compulsory means were needed; they went of their own accord. In my opinion the distance test should not be applied at the beginning of the famine; when the number of applicants increases with the increase of the distress, the distance test should then be applied. The people of this district are so averse to leave their homes that I consider a distance of 15 miles a quite sufficient test of their need. My labourers used to stay six days a week away from their homes, and on the seventh day they used to come home once, and again go back to their work. They had made huts by the roadsides to stay there and work. The members of each family had a hut of their own. The labourers were never compelled by me to go to a distance and to stay there, leaving their homes; but they were compelled by their own need to go to distant works and stay there and work. I strictly enforced the labour test, which I think was quite sufficient to keep away persons who were not in distress.

BOMBAY.

Mr. Hewlett.—As regards the amount of food stock in the country, I do not believe any very accurate estimate can be formed. The *Baniahs* and the rich cultivators are in the habit of storing grain in large earthern jars, which are buried either within the enclosure of their houses, or sometimes in the roadway outside. One thing is certain, that however severe a famine may be yet the food stock stored in the country would be sufficient to supply the people with grain if only the owners would open their stores and sell. During the height of the famine, when the price of grain was at its highest, the merchants at Itkal, in one of the worst famine districts, Kaladgi, exported grain in large quantities to Ameengurh, where they obtained higher prices, and when the famine was over it was found that large stores were available everywhere.

Mr. Spry.—No accurate forecast of the condition of the people could be made, at least I know no data which would give a basis for it. Only an approximate one could be made, and that would be very unreliable. Forecasts of this nature were called for by Government from the officers in each affected district, when the famine of 1876 first began to develope itself, but they turned out very inaccurate I think.

As regards the Kaladgi districts, the average food crops there far exceed the wants of the people; therefore, if even half the food crops failed, there would still, I think, be sufficient, but no margin for storing.

Mr. Propert.—I fail to see how a forecast of any value could be made by any district officer. I would far rather arrange for the wants of the district as the season advances. In the case of Khandesh during the past two years of scarcity, my own anticipations were so often at fault that I have ceased to believe in forecasts. In the season of 1876 I have no hesitation in saying that the general crop of Khandesh failed to the extent of between ½ and ¾, and in 1877 to the extent of about ½, and yet at no time had we more than 22,000 persons on relief works, out of a population of about one million, and at the same time the revenue for 1876 was collected with the exception of only Rs. 21,289-8-3, while for 1877 remissions amounting to Rs. 11,099-1-2 only were granted.

From this I argue that, if in spite of the general poverty of this province the general results of the severe scarcity were (if I may use such an expression) *so satisfactory*, it becomes in my opinion totally useless to waste one's *time* in making fanciful forecasts.

Mr. Norman.—The Poona District is bounded towards the west by the Ghauts, and along this range the periodical rains have hitherto never been known to fail. It is, therefore, impossible to conceive that there could be serious failure of crops over the whole area of the district for two successive years. In the more eastern talukas the crops in 1875–76 were very bad, certainly not more than half the average, and the same was the case in 1877–78. In 1876–77 there was, as nearly as possible, an absolute failure. Irrigated lands alone produced anything, and, owing to failure of water, much less land than usual was irrigated. Notwithstanding this state of things, there has been no absolute failure in the grain supply. Prices have ruled higher this year (1877–78) than in the year of famine, but the stocks have been ample to meet all demands. Had the railway been able to carry all the grain consigned to Poonah in 1876–77, it is most probable that the stocks would have been larger, and prices would consequently have been easier. I argue, therefore, that as far as this district is concerned there is no fear, even under the most unfavourable combination of circumstances of any failure in the grain supply. Prices, no doubt, may rise even to a higher figure than they have yet attained, but a sufficiency of grain will be forthcoming, though, in proportion as prices rise more and more, people would have to be supported by the State. A forecast of the state of the crops and the general prospects is now submitted to Government by every collector in the month of December, and it would then not be very difficult to estimate the actual balance of grain in the country and the probable yield of the next harvest. The power of the trade to bring grain into the district can only be estimated by the carrying power of the railway, which can be accurately estimated by that department; but even that power might, in case of emergency, be largely increased by doubling the line, a work of no great difficulty, and by the employment of bullock carriage. During the last famine, the largest proportion of the population on the works and in receipt of State aid amounted to nine* per cent., and I do not think that, under any combination of circumstances likely to occur, this proportion is likely to be largely increased. I am unable to divide the applicants into the three classes mentioned, viz.: field labourers, urban poor, and infirm dependents, or mendicants, having no returns to guide me.

Mr. Moore.—I cannot answer this question satisfactorily. If there was a partial failure of the crops, I should learn from my *Mamlatdars* what the condition of the people is, and I should act accordingly. If only half the average food crop is lost I think the people would manage very well with the assistance of a good sized work or two for unskilled labour, to which the poorer classes could resort for maintenance. It would be merely a case of high prices. Because there is generally a considerable quantity of food grain in stock and with half crop there would be no lack of food, and the wages on the large works would enable the poorer classes to buy food. I think that about one-fortieth part of the population would probably require to be assisted, say about 25,000.

If one-third of the crop failed I think there would be little or no need for assistance.

If one-half failed, about 25,000 might need relief.

If two-thirds failed, the numbers might rise to 40,000; and if this happened in two consecutive years the numbers would not be very largely increased, because the same classes would suffer, and we should have to continue our support. I do not believe that the comparatively well-to-do classes would come on our hands in the second year.

Colonel Anderson.—No estimate of the food crop would be of very *material use* unless it could be ensured that a known proportion of that crop would come into the market. It is more or less in all grain-producing tracts in the south of Bombay the practice to store grain in pits for many years. It is said that this practice has much decreased of recent years in the vicinity of railways, where the ready means of export have induced quick sales of produce, but it most undoubtedly survives in full force in the inland tracts. In the Kaladgi Collectorate and in Dharwar great quantities of grain were stored over the famine of last year, and only appeared freely in the market as distinguished from Jabalpur grain, as the imported grain was called when rain had fully fallen. An impending scarcity of famine will always induce the hoarding of grain and aggravate the rise of prices.

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Bombay.

Previous experience of a famine could alone be a clue to the numbers who might require to be fed in a future famine, and that experience might require to be tempered by a knowledge of the degree of strictness with which the relief of a former famine was worked.

Mr. Robertson.—The forecasts made by the district officers were based on their knowledge of the condition of the people, the crops, &c.; but I do not know exactly the manner in which they were drawn up. Nothing was known as to food stocks; but from about December 1876 the people who buy grain in the markets lived on imported grain, as there was no local grain to be bought. No doubt some lived on their own stocks, but they kept this carefully concealed; yet, after the end of the famine, local stocks began to come out.

Mr. Robertson.—Except in the case of a famine all over India, which is next to an impossibility, such a forecast as is proposed would in this presidency be of no practical utility.

What is more, it could not be prepared with any approach to accuracy. I assert it is quite impossible to calculate the food stocks. Thanks to trade and communications, if half the food crop was lost other places would supply the deficiency. I hold that, except in a universal famine, it is not in this presidency a question of quantity of food, but the question of price, and the absence of purchasing means by the poor. In fact there can be no famine of food.

We have in each village our village forms. One of these, the yearly census as it may be called, is corrected each year. From these we can very fairly gather the number of the poorer classes who will require aid. The estimates sent in by the local officers in this presidency in December 1876, and which were transmitted to the Government of India, were remarkably near to the truth as tested by after experience.

If a famine lasted two consecutive seasons there is no officer who could estimate, with any approach to accuracy, the numbers who would require to be brought on works and on relief. That would entirely depend on the private resources of each person.

Mr. Spry.—The point I would most strongly urge, if called on to make recommendations based on my famine experience, is the importance of making a railway. The district of Kaladgi has a very good soil and a very thrifty class of cultivators, not much in debt to *Saucars*, and they find it so impossible to get their produce away that they bury it extensively in pits; especially so in the south. But Indi taluka is only 19 miles from the railway at its nearest point, and Sindagi 40 miles, and there very little grain is stored, because of the means of export. The inaccessible portion of the district is the part that lies south of the Krishna. There are few grain dealers in that portion—the grain lies in the hands of *ryots* in pits. The custom is that every market day they send in their grain in carts to be sold through *dalals* (brokers); there are three or four such markets in each *taluka*, and in this way those who have to purchase grain—all the urban population, and all rural non-producers who have no stocks—lay in their week's stocks. When the panic of famine began the

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* On works	54,000
Direct relief	30,000
	84,000
Population according to the Census of 1872	907,235

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BOMBAY.

ryots closed their pits. This panic set in in October 1876, when the failure of rain was assured; partly, too, they combine to strike for higher prices (see my remarks printed on page 245 of the Bombay Compilation of replies). Their action was more due to combination than to panic—many said they would not sell till prices rose to 4 seers per rupee. When I persuaded people to bring in some sacks of grain to sell, I placed a police guard over it to protect it, without which it would have been looted. When the import of Government grain showed the people how easy it was to import, the cotton dealers and merchants whose ordinary business was only export and mainly export of cotton, and who had no stocks of grain, took to import, wrote to correspondents at Sholapur, and brought grain in on carts and camels, and this kept prices down. Thus the Government import created a trade where none existed before, and if it had not been for this there would have been great mortality and general anarchy and robbery. The grain import by Government was very expensive, for 240,000 lbs. cost 22,000 rupees, and I consider that this may be taken as a proof that Government can only enter into such business at a greater cost than traders can work at, since there is no doubt that traders could have thrown in the grain at a less cost. If there had been any existing trade, and especially if there had been a railway into Kaladgi, I think Government should not have imported. Afterwards there was no need for further interference, when once trade was set going. But the carriage gradually grew very dear; from Sholapur to Bijapur, 61 miles, in July 1877, the hire of a cart was Rs. 35, and the general rate was from Rs. 20 to Rs. 30. The cart carried rather less than usual, 10 maunds, because the bullocks were weak. At this time a system of carriage by head-loads sprang up. Men went from their villages with a few rupees, bought grain and returned to sell it in their villages or the market. They were not hired labourers carrying for big traders, but men who speculated in a small way with their own little capital. This mostly applies to the parts north of Bijapur, but also reached a little further south. About 3,000 or 4,000 people a day crossed the Bhima ferries and the north-eastern frontier from the Nizam's territories every day on this business. This stopped when the rains in September made the road impassable; but then people became more hopeful and opened their pits. I think on the whole the northern taluks fared best in the famine; other conditions having been equal they had little stocks but easy communications, while the southern taluks had large stocks but little means of communication. But speaking generally the southern taluks are the best off. All through the famine the import trade carried on was entirely put in motion by local dealers sending for grain to other places like Sholapur, Bellary, Belgaum, Hubli, &c.; no big trader from those places sent in any except upon an order from some local man in the Kaladgi District.

MADRAS.

MADRAS.

Mr. Whiteside.—A district officer has available many returns and statistical reports from which he can form with great accuracy a forecast as to the state of the coming season in his own district, while the reports printed and circulated by Government in regard to the condition of adjacent districts place him in a position to calculate how far the state of the surrounding country is likely to affect his own district as regards prices, demands for grain for exportation, &c. But the calculation of the quantity of the stocks of grain actually in hand, and the length of time for which they will last for the support of the local community, is a far more difficult matter. All natives, and especially the agricultural class, are addicted to the hoarding of grain year by year. A prodigious share of the crops as they come off the ground are stored away in under-ground receptacles, the existence of which is jealously concealed and strenuously denied if inquired after. These stores of grain are kept intact, often for years at a time, and are gradually fallen back on when scarcity prevails, or when bazaar prices rise inconveniently. It is impossible to estimate even with approximate accuracy the total amount of these grain-stores, but of their existence in large numbers we have clear and unmistakable evidence afforded in the course of the famine, which has now prevailed in this district for upwards of two years. According to the last Census the population of North Arcot was 2,015,000 persons, and during the famine it was calculated that 1,500 tons of grain per diem would be required to feed those people. But when the famine was at its highest pitch of severity, the largest quantity of grain imported by rail in any one week never exceeded 1,000 tons. It was thus clear that the vast bulk of the population was being regularly supported by grain actually present in the district. The grain dealers' supplies in the large towns consisted chiefly of grain imported by rail, but the great mass of the agrarian population throughout the past two years have been eating their own grain. This is further shown by the fact that when the late raggy harvest was known to be a fine one, and heavy crops were being reaped, large quantities of old raggy were suddenly thrown into the market in various places by people who must have kept them in store throughout the last two years in spite of the enormous prices that could have been realised had they chosen to sell earlier. This district is so well supplied by railways, and there is such an excellent system of road communication from the various railway stations, that no difficulty was experienced throughout the famine in getting stocks of imported grain from the railway stations to the chief market towns. There was, therefore, never a famine of food in the true sense of the word. The secret grain-stocks coupled with the weekly importations by rail amply supplied for the needs of the people. But it was impossible to calculate even with approximate accuracy the amount of grain stored away in the villages, for such accumulation had been made gradually and secretly for years, and though the divisional officers were certain that they existed, the owners would not for a moment admit the fact, partly from a fear lest they should be marked down for a grain dacoity at an early date, and partly lest the Government officials should refuse them State aid as the famine went on.

The real difficulty was lack of money to purchase food at existing high rates.

Mr. Longley.—I admit that, if an accurate forecast could be made, it would be of great utility, but I am of opinion that this is not possible for the following reasons:—

(1.) If the distress is widespread embracing, as in the present famine, ten or eleven districts, or in foreign countries, Burmah for instance, which draws away food stocks from this country, the condition of the people can by no means be presaged, considering the facilities now afforded for exportation, *i.e.*, sea-boards, roads, and railways. As an instance, I may say that the stress of the present famine would have been felt later on in Salem if there had been no exports to Mysore in the earlier stages of distress.

(2.) Another element which lowers the value of the forecast is that the mere fact that the estimated stock in the country can feed so many thousands of people for so many days is no index to the quantity required *to be supplemented*, for, when distress commences and prospects appear doubtful, a great number of those agriculturists and proprietors of land with whom the stocks remain withhold contributing to the general market either in hopes of getting still higher prices or in view to guard themselves against the contingency of a greater scarcity, while merchants export all the grain they can secure to places where higher prices rule.

(3.) It must not be forgotten that with distress people possessed of a limited supply of food begin to reduce their own rations. This reduction is in proportion to each person's means or other circumstances, so that a forecast based on the assumption, say, that a male or female of a given age would consume so much in ordinary times would fail to be of much practical value.

(4.) But, supposing that the above elements are absent, there is still a difficulty in making an estimate; for, though the productive power of the country can be estimated, there are no reliable data on which to calculate the existing stocks in the country, as we have no information at present of the actual quantity of normal exportations and importations.

(5.) Assuming the distress to be local, the data for a forecast are (1) the census returns which give particulars as to age, number, sex, &c., of the total population as divided into several castes and classes, and (2) the cultivation returns of the district. Ascertaining the average quantity of food consumed by people of different ages, sexes, and classes, an approximate estimate of the total quantity of food required is arrived at by the help of the census returns. The cultivation returns give us the area cultivated with different crops in Government villages. The average yield per acre of each crop being determined, the total average production of the district may be assumed. It should be noted here that there are no accounts either with Government officers or with Zemindars to show the *cultivation* in the villages belonging to the latter. In fact, Zemindars do not require such accounts, as they collect assessment on the whole holding irrespective of the circumstances under which lands are left waste. This also contributes to lessen the value of the forecast, though for the purpose of this calculation the proportion of cultivation to waste in zemindaris may be assumed to be in the same ratio as in Government villages. The following is an estimate, based on the normal consumption of the population, of the food available for the Salem District (*vide* accompanying statement):—

		Acres cultivated.	Average Yield per Acre. Madras Measure.	Total Yield. Madras Measure.
Yield in years preceding the failure.	Dry food grains.	1,422,393	350	4,97,837,550
	Wet crops	114,427	400	45,770,800
	Total -	1,536,820	-	54,36,08,350
Consumption in the year according to the accompanying statement - -				3,67,541,130
Balance to the credit of the year in which the failure occurs - -				1,76,067,220
Production in a year of half yield -				2,76,804,175
Add the surplus of previous year on the assumption, say, that all above a year's surplus is disposed of - -				1,76,067,220
	Total -			4,52,871,395
Average quantity required for a day throughout the district - - -				10,06,962
Number of days for which the above quantity would suffice - - -				450

N.B.—Population 1,966,995.

The total yield of the district in the year in which the failure occurred together with the surplus of previous years in stock is sufficient to sustain the people throughout the year; but, as the stock is not distributed equally among all classes and peoples, importations would be required to feed that portion who, if the market is not supplied by stock-keepers, are unable to purchase food grain.

The census returns furnish information as to classes who would be able to purchase in times of distress, "occupation" being taken as a standard for determining the same.

Persons of the following occupations may be classed as "able to purchase":—

- Government Service.
- Military.
- Learned Professions.
- Traders.
- Conveyers.
- Domestic Personal Service.
- Cultivators of large holdings.
- Industries—
  - Food.
  - Metals.
  - Construction.
  - Books.
- Indefinite and Non-productive—
  - Property.
  - Unproductive.
  - Others.

N.B.—These classes include holders of stocks as well as those who depend upon the market.

The following classes may be taken as those unable to purchase when high prices prevail:—

- Professions—
  - Minor Professions.
- Agricultural—
  - Small Cultivators.
- Industrial—
  - Dresses.
  - Household goods.
  - Combustibles.
  - Laborers.

These are the classes who require to be relieved by the State. As the number of the adult male population of the several classes is given in the census returns, an estimate can be formed of the numbers of their women and children on the basis of the district ratio. But it must be remembered that all the classes above mentioned will not come in for State aid at once, for, as above stated, they first reduce their rations, and for a considerable period stick to their homes and villages. The numbers, therefore, that will have to be relieved will increase as the distress becomes intense, so that no estimate of them can be formed.

The classes to be relieved are stated above. A great number of mendicants in Southern India do not go to camps or works.

I do not expect any numbers when the failure is one-third or half in the first year, but when it fails three-fourths, then the ryots of small holdings begin to dispose of their live stock, &c. In the absence of necessary materials, and considering the difficulties above indicated, I cannot form an approximate estimate of the numbers that will have to be relieved by the State at the different degrees of failure mentioned in the question, but merely enter the numbers (according to the Census of 1871) which will have to be relieved in the height of a famine in the succeeding years:—

	Men.	Women.	Children.
Minor Professions - -	7,722	7,799	9,778
Dresses - - -	40,056	40,456	50,722
Household goods - -	4,904	14,953	6,209
Combustibles - -	424	428	536
Laborers - -	118,206	119,388	149,684
Sixty per cent. of cultivators -	201,792	203,814	255,534
	373,104	376,838	472,663
Total -	12,22,605		

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MADRAS.

Mr. J. G. Horsfall.—The population is now pretty accurately known from our census returns. We get returns also showing the extent of land sown with food grains and approximately the quantity of the produce, so that there would be no great difficulty in calculating what proportion of the population could be fed upon the produce of any single year ; but other ingredients step in to make the calculation anything but a simple or certain one. The result of previous harvests, the stock of grain in hand, are most important ; the resources of the district and its production of other than food produce are important disturbing elements. Then again statistics as to the food-grains and other produce in zemindaris are not forthcoming. This needs correction, if necessary, by legislative enactment. The condition of other districts and other markets has also to be taken into consideration, regulating, as they do, the probability of exports and imports, for the merchant will not be deterred from exporting food grains from a district already in famine if other markets are more favourable. Still the primary considerations are the population to be fed and the amount of food grain produced, and with these as his data, with due allowance for other disturbing elements, a pretty accurate estimate may be formed as to the proportion of population likely to be dependent upon relief during the next few months of any year. The estimated yield in food grains of a fair year in this district excluding zemindari lands is 450,000, the population of the same being about 1,150,000, the quantity required for consumption being estimated at 300,000 candies,* thus giving a very large surplus to store and export. The produce and population of zemindari tracts may be assumed to bear the same proportion, thus giving estimated produce of food grains at 560,000 candies, population 1,450,000 with a consumption of 380,000 candies, leaving a surplus of 180,000. Thus half an average crop would leave 100,000 candies to be provided from stored grain or imports ; that is, over 300,000 would be without food. These must be fed by imported grain and by grain already stored. A failure of one-third crop only would merely reduce the amount otherwise available for exportation, but would not necessitate any relief measures at the hands of the State.

It is questionable whether the failure of one-half the crop would even necessitate State interference. The crops in this district for the year 1877–78 were estimated at little more than half an average crop, and yet no relief has been administered since the commencement of the year. Prices have pressed very hardly upon all three classes, but actual State assistance has not been found absolutely necessary.

The loss of three-quarters of the crop would leave sufficient produce to meet the wants of one-third of the population only. Two-thirds of the population would be dependent in such case upon stored grain and importation. I should expect 5 per cent. of the population to come upon relief in such a case.

For the reasons stated above the loss of one-third crop in two consecutive years would not entail any State relief.

For a second year with only half a crop the proportion to be relieved would not exceed two per centum of population. As a matter of fact, after two years with only half the average yield, we have now in this district no relief measures or State aid whatever. In the case of three-quarter failure of crops in two successive years twenty per centum would probably require Government relief.

Mr. Price.—I should start by assuming that the population of the district consumed, on an average, $1\frac{1}{2}$lb. of grain per diem, which, from frequent observation long before the famine, I believe to be a fairly correct estimate. I would then take the area of crop actually reaped in the preceding year and the area cultivated in the year up to date of the forecast, compare this with the cultivation at the corresponding period of the previous year, and so make some approximate estimate of the cultivation for the whole of the year under consideration. I should then calculate, by taking the reported outturn of the previous season, and making such deductions for the difference so far observable in the two seasons, as appeared to me to be right, what the probable out-turn would be, and, by putting this into pounds, would be able to estimate for how long the people of the district could be supported by the crop of the year for which the forecast was made, and how much grain in the way of stock might be taken to be in hand. In a district such as this it is with rare exceptions that any stock of more than a year's standing is kept on hand. In Cuddapah and Bellary, where much grain is buried, it is absolutely impossible for any reliable estimate of what stock of grain is really stored to be made. The sequel of the famine showed clearly enough that, in places where the most experienced native officials stated the opinion that there was no grain whatever, large quantities were hoarded. I see no other way than that suggested of framing a forecast ; at the best no officer, even one intimately acquainted with his district, can make anything but a very rough calculation. If he allows, on the unfavorable side, a liberal margin for error, he will place himself, though he may not be very accurate, on the safe side.

Take that the average annual crop of food-grains of all kinds in this district is 279,812 tons (which is something about the mark). Half of this would be 139,906 tons. The population as per census of 1871 was 940,747. Allow a daily average consumption of $1\frac{1}{2}$lb. per head. This would give 222 as the number of days for which the population of the district could be supplied. The difference would have to be made up by importation. The estimate of the number of persons who would probably be able to purchase food would entirely depend upon whether the failure of crop was for the first or second time; a failure of one-third would for the first year cause no appreciable indication of pressure, excepting perhaps that prices might rise a little; a failure of half would cause a demand for employment towards the close of the season, which ought to be met easily enough by the ordinary work of the district ; and a failure of three-fourths would probably create a necessity for small special works, but not relief at home. As to what the percentage of the population which would thus come upon relief would be I can form no estimate. I would not have touched on the subject at all had I not seen in 1866 the case of a failure of three-fourths crop in the Salem District. There was then certainly no visible distress in villages, but the people clamoured much for work. Some comparatively small sums were spent upon new roads, but what the proportion of people who came upon the works was I have no means of stating. I recollect that they were in the main agricultural labourers. A failure of one-third for a second year would not, in my opinion, throw any appreciable number of persons unable to buy food on the hands of the State; a failure of half would call for assistance on the part of the State to 10 per cent., and of three-fourths crop of something like 20 to 25 per cent. The figures of relief operations should, in my opinion, most decidedly not be taken as the basis of any calculation as to how many persons out of the population of any particular district may, under certain known conditions, be expected to come upon the hands of the State in the event of the failure of crops. I make this remark in reference to my personal experiences in the districts of Bellary, Cuddapah, and Chingleput. My reason for it is that I am aware that very many individuals were admitted to relief of all kinds who ought not to have been.

Mr. Martin.—In this division I should say that a failure of one-third of the average crop even for two years would not produce a necessity for relief. If half the average failed, I should expect that relief would

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* *N.B.*—This cannot be right if the candies were intended to denote the usual measure of weight. Tons would be near the mark.

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not be required if the failure was equally spread, and if the rain-fall was sufficient to produce wild vegetables and to prevent the fish and other animals which live in the water from dying, but if this failure of half was not equally distributed, there would probably be distress in the part where the average production falls below half, and the distress would vary with the extent of failure; thus, in a tract inhabited by 100,000 people I should expect to have seven thousand on relief if the failure extended to three-fourths. If this distress was repeated for a second year, I should expect to have fifteen thousand of the people of this tract on my hands, and moreover people from both the tracts in which the failure was both half and less because of the high prices. The numbers would in all probability be 5 per cent. of the whole population of these last tracts.

If the failure was three-fourths the average, this would probably mean that there was no production at all in part of the tract, and that only a small part would have as much as half. I should expect to have 10 per cent. of the whole population on my hands before the first year was over, and if the distress was continued for a second year, I should not be surprised if the numbers went as high as 30 per cent. It is exceedingly unlikely in this division that a failure amounting to even half of the crop will be protracted, for any heavy rain, even though it may be sufficiently heavy to seriously damage the general harvest, must supply the wells, and the moment the wells are supplied, labor is available and a crop is put down. In a very bad season the crop raised comes to market in sixty days, and as the wells are capable of yielding a total weight of 33,000 tons, the relief from them will be very rapid and will speedily alter the ratio of the production to the average.

MYSORE.

MYSORE.

Mr. Ricketts.—If the food crops failed to a very notable extent for two consecutive years, it is clear that owing to deaths from starvation and disease, &c., the number on hand in the second year would be considerably less than in the first year.

Taken by itself the loss of half the average food crop of the district might not prove very disastrous, if the previous seasons had been good and the people were flourishing. I will assume that the existing food stocks and the power of trade to bring in more are elements sufficient to supply the quantity of food grain actually required for consumption, and all that is wanted is money to purchase food; but how much money would be so wanted and how many persons would have to be relieved by wages or by food would depend not only on the current famine prices of food, but the proportion they bore to current rates before the famine. Forecasts are further delusive in that during the actual period of famine the additions to the number requiring relief are of daily occurrence, as fresh villages, and even groups of villages, suddenly and sometimes without previous warning fall into the ranks of the famine stricken. As a famine progresses, and knowing what is being done and what is proposed to be done, it is possible to make some forecast, but in my opinion not before.

QUESTION 6.—MEASURES FOR MEETING TEMPORARY DISTRESS.

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What measures should the district officer adopt for relief, supposing that he believes the distress to be temporary, or is not satisfied that it is indicative of approaching famine? Should applicants be first employed as far as practicable on the ordinary works in progress, whether under provincial or local officers or under agents of the Public Works Department or municipalities? Under what tests should applicants be admitted? Under what circumstances may it be desirable to open special works? How should such special works be arranged? Whether so as to collect the applicants in comparatively large numbers at a few localities, or to give them employment in smaller bodies at many places in the distressed region and in the vicinity of their homes? May such works be best placed under the Public Works Department or under Civil supervision? State the arguments in favour of and against either course? How may the Public Works officers be best placed in communication with the district officers for these purposes? How should the Public Works officers be guided in their selection of works for relief? And on whom should the responsibility rest in the district for seeing that all needful steps are taken by all branches of the public service concerned?

Punjab.—6 answers are given. They are in accord with the views of the Bombay and North-Western Provinces officers.

North-Western Provinces.—35 officers have answered. The purport of the answers is similar to that of the Bombay replies. All applicants should be admitted.

Bengal.—17 answers are given. They agree that first ordinary and then special works should be opened, but some officers advocate more numerous works near the people's homes as the distress deepens.

Bombay.—15 officers have answered the question. Their views are—

That distressed persons should be employed in the first instance on the ordinary works of the season. That the year's budget grants should be re-appropriated from works requiring skilled to works requiring unskilled labour. That special works should be opened as need increases. That they should be large and few, and not near the people's homes. That they should be under the Public Works Department, the officers of which understand the management of works. That the general responsibility for the care of the distressed people should rest on the collector.

Madras.—39 European and 5 Native gentlemen have replied to this question.

In the early stage of temporary distress it is generally considered that a vigorous prosecution of the ordinary works in a district—provincial, local, and municipal—will be sufficient to meet the enhanced requirements for employment, and at this period a fair day's work for the usual wage is thought to be the only requisite test.

The majority of the officers consulted seem to think this would suffice at a more advanced stage of operations, as a general rule, which might, however, require modification with reference to works in the vicinity of large towns.

Special works should be put in hand immediately the ordinary works in progress fail to meet the demand for employment, and to meet this emergency promptly the plans, estimates, &c. for such works should be prepared beforehand. These works should be disposed so as to economise supervision, to be within moderately easy access of those needing employment, and to avoid the collection of unwieldly bodies of labourers in one locality. If long distances have to be traversed to reach relief works, people really needing employment

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will hesitate to go because of the difficulties of returning to their ordinary avocations should a favourable change of season occur. There is some variety of opinion as to the agency under which these special works should be prosecuted; but it is almost unanimous that, so far as professional supervision is concerned, they should be entirely under the Department of Public Works. As regards classification of labourers, issue of pay, sanitary and medical arrangements, and the general welfare of the labourers, it is thought that civil agency might advantageously be employed.

The Collector should be held responsible for the proper conduct of famine relief operations, and to this end all departments must work in subordination to him. The relation of the district or superintending engineer to the Collector would be that of professional adviser, and in the selection of works they should act in concert.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—If the distress be temporary, it would only be necessary to provide the people with employment in the public works that may be going on at the time in the district, be they under civil or Public Works officers; but if the distress assumes a severer aspect, special works would have to be opened. All important works that require engineering skill should as a rule be entrusted to the officers of the Public Works Department; but in respect to forming gangs and making payments to them, the work should devolve upon civil officers. It would be difficult to give the people work in the vicinity of their home, as the advantages thereby secured to them will be comparatively much less than the loss which Government will suffer by the arrangement. Moreover, it will tempt the people who can afford to support themselves somehow or other to try to get themselves admitted into the relief works. Relief works should as a rule always be opened in places where works of public utility are needed, and which will be of permanent benefit to the people in general, but they need not necessarily be very far from the home of those who will be employed in them, and should, if possible, be within the tahsil in which they live.

Lieutenant-Colonel Parsons.—(*a.*) Ordinary works in progress, if within the capacity of all comers, are well adapted for relief purposes, otherwise special useful works should be started, more especially earthwork.

(*b.*) Works should be opened to all comers, as, if tests of apparent distress be applied, it is difficult to know that an applicant may not be on the verge of distress.

(*c.*) The locality of the works would depend in a measure on their necessity as relief works. (*d.*) If famine be extensive, it is difficult to arrange a sufficiency of small works, but an extreme of the distance test is not advocated. (*e.*) For the larger works, the supervision of Public Works officers is best on account of their professional qualifications and time at their disposal, but when works are not of an extensive nature, civil supervision is sufficient, and best suited to the peculiar requirements at such times. (*f.*) Public Works officers would be placed in communication with the district officers at such time as they received departmental orders authorising the required measures, and would consult district officers in their selection of works for relief. (*g.*) As the refusal to admit labourers in any case is not recommended, the responsibility for keeping the works in progress would rest with the supervising officer. It is not quite understood to what reference is made in the words "needful steps" at the close of question 6.

Mr. Roberts.—If liberal and timely suspensions of the land tax were made or promised, I do not think any special relief measures would be called for among the village population in any case of merely temporary distress, but that the proprietors, in comparatively easy circumstances, would, when relieved from this burden, readily undertake to provide for the poor of their own villages. In towns gratuitous relief should after a while be provided for the blind, lame, and helpless, and work for artizans thrown out of employment. At the very outset, and before hunger had had its effect in reducing the strength, I do not see any reason why applicants for relief should not be employed on works already in progress, whether under engineer or civil officers, in the same way as ordinary coolies, without any distinction. In that case no test would be needed. When, owing to the progress of famine, it becomes necessary to pay subsistence allowance to persons who cannot do a full day's work, special works must be started; and to avoid the demoralization of voluntary labourers, the two classes should not be employed on the same works. Classified gangs should be formed, and as a test of necessity, a minimum subsistence allowance given for tasks graduated according to the strength of labourers of different classes. Large works are preferable to small ones, because less difficult to supervise, and the agency of Public Works engineers better than that of civil officers, because they can devote more time and care to the management. The district officer must be responsible for seeking out the needy and sending them to the works, and for securing efficient aid from his subordinate establishment, and he should be in direct communication with the engineers in charge of the works. When large works affecting the interests of several districts are projected, the local government should select the schemes to be carried out; but, in the case of district roads and local irrigation works, the district officer and commissioner will be the best judges of their expediency.

Mr. Nicholl.—Applicants should, as far as possible, be first employed on ordinary works under local officers; no special tests should be applied.

Officers in charge of works can always satisfy themselves by inquiry and from appearances, whether applicants are really in want, and whether they should be employed or not.

Special works should only be opened when ordinary works do not give sufficient employment to all who apply.

If the distress in its first stage is general throughout a province or large tract of country, the employment of small bodies at many places in the distressed region and in the vicinity of their homes, is, in my opinion, the better plan.

The employment of large bodies at three or four localities in each district would only become necessary when the distress began to assume the features of a famine, or at the commencement of the second stage. At this stage the numbers requiring employment would be enormous, and the agency required to superintend them in small scattered groups would require to be in proportion.

Works requiring skilled labour would be best placed under officers of the Public Works Department, but works requiring unskilled labour might with advantage be placed under civil officers. My reason for offering this opinion is because the employment of professional men on large salaries to superintend earthwork, such as making roads, the lines of which have already been laid out, would be a waste of power and money. Men competent to superintend such works can always be obtained by civil officers for small salaries.

A deputy commissioner has always under his orders in some department or other, men acquainted with his district and the people, whom he could make available to exercise a general superintendence over works placed under him, so that the extra men would only be employed to augment his existing resources, and look to details.

Public Works officers could best be brought into close communication with district officers by being placed directly under them. This would be desirable in every way. The district officer is not only the principal civil officer in the district, but he is supposed to be better acquainted with the wants of the district and people than any other official. He is the man to whom the people would naturally look in time of trouble, and men working under his orders would receive willing obedience from the people.

Mr. Benton.—If it be believed that the distress is only temporary, I think that the district officer should arrange to provide for relief by commencing works of an ordinary character in the distressed tract, suspending other works elsewhere in order to provide the necessary funds, whether from district or municipal sources. These works would be carried on under the ordinary agencies, and not under the Public Works Department. The wages given should, I think, not be subsistence wages, but only slightly under the ordinary rate, so as to test the demand for work.

There would be no loss in this, as the ordinary tasks would be demanded, and inefficient persons would not be admitted on the works, which would be carried on with much greater ease. Full wages being paid, or nearly so, the able-bodied would be able to support their inefficient relations as in ordinary times. This system would be pursued until labour could be procured at rates considerably below the ordinary rates. This would be a sure sign that the distress was intensifying, and that a change should be made from payment for labour at full rates, to the exclusion of inefficient persons, to subsistence wages with admission of all persons who could perform any labour. If there were very serious distress, the district or municipal funds would not long bear the strain, and it would be necessary to apply to Government for assistance, and this would probably be the most suitable time to open special works. Government might be willing to expend money on works of an imperial character, while it would not be willing to spend Imperial or provincial funds on ordinary local works. These special works would of course, as far as possible, be works of a useful or even remunerative character, and this condition would probably leave little choice as to whether the applicants for relief should be collected in large bodies at a few places, or at many places in the vicinity of their homes. In any case the works would be near the homes of a number of the applicants for relief, which is no doubt an advantage, provided care be taken that the relief works are not abused; and I would not be deterred by any fear of breaking up homes from calling on the others to move for a time to works at some distance.

I think that generally these works ought to be under the Public Works Department, as they would probably be works of importance demanding engineering skill; but in any case, as they would by the supposition be attended by crowds of people who were too numerous to be relieved on petty district works, keeping order among them, exacting sufficient tasks, and executing the work in a proper manner, would no doubt be very difficult tasks for even professional officers with well trained subordinates. The want of trained subordinates for this purpose was severely felt on the works undertaken in Karnál last year, as the work was badly done, and the exertions of the labourers were not by any means turned to the best account.

I should think that tests for admission to works, whether ordinary or special, conducted on the system described above, were scarcely necessary. On the former works the applicants for relief would be required to give a fair day's work for something less than an ordinary day's wages, and in the latter they would be required to perform a reasonable task according to ability for a subsistence allowance.

I think the Public Works officers should carry on these works, just as other works, under the direction of their departmental superiors; it being well understood, however, that the immediate object in executing the works was to provide relief for the distress. It would, however, be competent to the district officer to give any order in writing concerning the admission or treatment of distressed persons to the Public Works officers; and the Public Works officers should be bound to carry out the same whether they approved or not, pending a reference to departmental superiors, who would immediately be furnished with copies of the same, together with the objections of the Public Works officers if there were any. If departmental superiors could not agree, a reference to Government would be necessary. This procedure would be similar to that provided for the interference of the magistrate of the district in jail management.

With this provision the district officer might properly be held responsible for the entire management of relief operations, so far as they affected the treatment of the distress as apart from the execution of the works, which would be carried out in accordance with plans and estimates sanctioned by the proper authority. In this way the officers of the Civil and the Public Works Departments might be restricted to matters within their respective provinces; but it is unnecessary to add that, without an earnest desire on the part of both to work in concord as far as possible, continual jarring and cross purposes might be anticipated.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. Sells.—All relief works should, in my opinion, be such as can be executed by utterly unskilled and unintelligent labourers. This is the most important point for consideration in determining the comparative suitability of projects. In municipal towns the committees will, as a rule, be able to afford employment to a considerable number; sanctioned works giving place, if necessary, to other extemporized work, if the latter are of a more suitable nature. In other places, the Public Works Department should co-operate with the district officer, and works determined upon by the latter should be carried out under the supervision of the former. If the sanctioned projects of the Public Works Department are of a suitable nature, no special works need be started, possibly; but if they are not suitable, that is, if they require more or less skilled labour, special work should certainly be started. For ease of supervision such works should be few in number, and should be fairly distributed in the most distressed parts of the districts. Large numbers at three or four places that would be, I should say, readily managed, than small knots of labourers scattered about at distances of every five or ten miles. Supply of food also can be better regulated.

Captain Home.—District officer should consult with executive engineers as to what works, for which provision has been made in the budget, can be started, or, if already started, pushed on with more vigour. He should at the same time report to the commissioner, who would put himself in communication with superintending engineers.

Ordinary works in progress should be utilized as far as possible.

Subsistence allowance and task-work should be the tests.

I. II. Qn. 6.

NORTH-WESTERN PROVINCES AND OUDH.

Special works would only be opened in case of there being no ordinary works available, or if distress increased.

Special works should be arranged so as to collect the applicants in comparatively large numbers at a few localities; this is necessary in order to ensure proper supervision and economy.

Special works should be under the supervision of the Public Works Department, because its officers are in the habit of dealing with large gangs of labourers and of portioning out task-work. Want of experience in such matters is sure to lead to waste of money and laxity of discipline. At the same time the works should be visited from time to time by the district officers in company with the executive engineer, and all requirements and alterations discussed and settled on the spot as far as possible.

Works for relief should be selected on the following principles:—

1st. They should be works which can for the most part be executed by unskilled labour.

2nd. They should be works of utility, and, if possible, of necessity; that is to say, works which must be carried out some day, but which have been postponed for want of funds or other causes.

3rd. At the first outbreak of distress, works of moderate size, or works which can be divided into self contained sections, should be selected, so that in case of the distress passing off, Government may not be committed to a large expenditure to complete them.

The collector should be responsible for seeing that all needful steps are taken.

Mr. Cordner.—(*b.*) I think applicants for work should, as far as possible, be employed at first on ordinary works in progress in a district, so long as such employment of them does not interfere with existing contracts, as it would not be fair to contractors to insist on their employing such labour after taking up a contract.

(*d.*) Special works should be opened as soon as it is apparent that overcrowding is likely to take place on ordinary works in progress. Such special works should be arranged for in consultation between the Civil and Public Works Department officers.

(*e.*) Supposing the relief to be of a temporary nature, I think small works near their homes the best, and the reverse if the distress is likely to be lasting.

(*f.*) Petty works such as do not require any engineering skill are better under the civil officers.

(*h.*) Public works officers will be best guided in selecting relief works by consultation with civil officers as to what will be a permanent improvement to the district or province.

Major Jeffreys.—(*a.*) He should induce the Public Works authorities to push on or extend all ordinary works sanctioned or in progress.

(*c.*) Under the labour test strictly applied, *i.e.*, working through contractors at the ordinary contract rates.

(*d.*) Special works other than sanctioned and ordinary should not be opened until a considerable amount of distress is apparent.

(*g.*) Under the Public Works Department certainly.

(*h.*) The advantage of placing them under Public Works officers is that you get the necessary technical knowledge to prevent any serious mistake of construction, such as inaccuracies in digging levels, &c. The measurements are more likely to be accurately made. The Public Works Department has a large staff of European subordinates, who, properly supervised by competent assistants, are more likely than any civil agency to prevent the development of those abuses which are certain to follow the working of an establishment composed entirely of natives, such as a department presided over by single civil officer would be.

The advantage of a civil officer would be that he would better understand the native character, would find it easier to prevent desertions, by apportioning the severity of the task to the character and class of people with which he has to deal; but on the other hand it is likely he would be more profuse in the expenditure of Government money.

(*k.*) Those which would be most useful to the country.

(*l.*) On the Collector.

Mr. Colvin.—Open ordinary works experimentally.

Yes; under Department Public Works and also in municipal works.

I would admit all who come, but they would be paid by the work done at ordinary rates. If experience shows that the works were largely attended by classes who ordinarily do not come to them, and who from inexperience could not work at Department Public Works rates, special works should be opened.

Mr. Sandys.—The ordinary works in progress in this district would not, I think, afford sufficient relief even if the distress were to be temporary. If there were any distress it were necessary to relieve, it would last with more or less severity for six months at least, and special works with light task-work to commence with should be started without delay, and before the classes requiring employment are reduced in condition. The distance and wage test should be rigorously applied.

Supposing the special works to be taken in hand in good time, the able-bodied applicants should be collected in large numbers at a few localities and be engaged on works placed under the Public Works Department. The money thus spent in supporting those requiring relief would be expended on works of real public utility, and with the limited Public Works Department establishment and difficulty of largely increasing it on a sudden emergency, the supervision would be more effective.

Applicants who would be placed in the efficient gangs should alone be given employment in the district to which they belong, if there were no large works in hand there; and it would, I think, be better to employ these inefficient gangs in large numbers at a few localities, so as to admit of the completion of the most important of the district works and of a more efficient superintendence. Experience shows that employment will have to be given for at least six months, and if the small works in the vicinity of the homes of the applicants are started under civil supervision, a large number of persons are attracted who do not require relief at all events at the earliest stage of the scarcity; the small works are comparatively of small public utility, and civil supervision, owing to paucity of officers and want of professional knowledge, is sure to be weak. Public Works officers can best be placed in communication with district officers by being appointed, as they are in these provinces, to the staff of the district officer, and by being required to be guided by the advice of the district officer in the selection of works for relief and number required to be taken in hand.

The district officer must be held responsible for seeing that all needful steps are taken by all branches of the public service.

Mr. Tracy.—Relief works should be commenced tentatively. Employment should first be offered on ordinary district or municipal works. All applicants should be admitted who are willing to work for subsistence wages. If the applicants for labour on these terms become too numerous, special works be opened. I am in favour of giving employment at many places and in the vicinity of the homes of the distressed. Small bodies of labourers are more manageable and less likely to suffer from epidemics, and if near their homes, their labour would be available to their usual employers in the event of a favourable change of season. At the outset it would be better to employ the distressed on such works as the repair and maintenance of the district communications, under civil

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supervision. Should these prove inadequate, larger works, such as canals and railways, should be provided under the Public Works Department. These works would be selected by Government. The Public Works officers should be required to employ labourers in accordance with the rules prescribed by Government for relief works, and should submit their returns through the collector. The district officer should be responsible for seeing that all needful steps are taken by all employed in his district.

Mr. Mellor.—If it be likely that there will be at no very distant period general employment in the fields, it is obviously better to give employment on small works which will be quickly completed, and which will not take the people to any great distance from their homes, than to open a large work. At the same time a large number of small works are more difficult to supervise than one big work. I consider that the management of the works should be under the Public Works Department, but that the civil authorities should select them.

Mr. Leeds.—I should advocate works under the Public Works Department, the civil staff being everywhere too limited to deal satisfactorily with such matters otherwise than in the way of general supervision. One or more centrally situated works are, I think, preferable to a number of petty works at many places in the distressed region. The nearer the works are to the people's homes, the larger is sure to be the number of those who resort to them, and the reality of the distress can therefore be best tested by forcing applicants for relief to go a certain distance.

Mr. Lawrence.—After the ordinary repairs have been completed I would advocate the employment of distress labourers on other district requirements. There are always roads which will be the better for raising. But when famine has declared itself, I would mass the labourers. Proper supervision over large numbers, if scattered, is impossible. The only tests I know of are enforced residence and the labour test. But there may be times when the prevalence of disease will necessitate resort to small works. All the works should be in charge of Public Works officers, under the general supervision of district officers. The latter select the works, arrange for supplies, hut and pay the labourers, and are generally answerable for the management, but the less they interfere with the Department Public Works officers the better. The latter, if they are worth their salt, take interest in all branches of the management, not in construction only. He is on the spot with a large staff of assistants, all of whom can do something beyond mere construction.

Mr. Whalley.—If the district officer believes the distress to be temporary, he should at once exert himself to the utmost to obtain suspension of revenue in the tracts most affected, and in the villages where he can depend on the zemindars co-operating with him. The suspension should be generally conditional on the zemindars supporting and employing their own poor. To aid them in doing this takávi should be liberally given for agricultural improvements. At the same time public works should be vigorously pushed on, on the ordinary system, and contracts offered on favourable terms to zemindars who have no other way of employing their poor. I know this has been tried and failed or been very partially successful. I could give reasons for its having failed, but I know of none why it should not succeed if properly managed. Relief works should not be opened until the number of destitute is evidently too large to be relieved and employed by the zemindar.

Small relief works should then be opened under the supervision of civil officers in the most distressed parts. If more is necessary distress has passed beyond the temporary stage. Then it becomes necessary to start large works under Public Works officers. These works are better at a little distance, say 20 or 30 miles, from the scene of distress. They should be fed from the civil officer's works, and the latter in turn should draw from the zemindars works, which having served their purpose, would be gradually depleted and wound up.

The civil officer's works, too, will be gradually turned into a machinery for collecting and forwarding destitute labourers to the public works branch, until the whole of the relief labour is concentrated in the hands of the latter.

Mr. Cornwall.—As a preliminary measure, the works in the district budget for the year will probably be found sufficient, and they could be utilized tentatively. The opening of special works before the necessity for them is apparently established tends to demoralize the people and does more harm than good. At first applicants might be admitted upon a task-work calculated to give them a somewhat lower rate of pay than ordinarily obtainable: and if numbers come upon those terms it would show that distress was increasing and the time for opening special works had arrived. Then the large schemes reserved for such occasions can be taken in hand.

The question as to the employment of large numbers at few places or smaller numbers at more places seems entirely dependent upon the amount of supervision Government is prepared to pay for. Large numbers at few localities are more easily supervised, and the work is consequently better and more cheaply performed. The cost of removing the huts as the camps are moved is nominal, and frequent changes are, from a sanitary point of view, to be recommended. All such works should be left under the immediate control of the Public Works Department. The district engineer should be informed by the Collector of the work he was to take in hand from time to time, and a sufficient staff of officers allotted to him to enable proper supervision to be carried out. The relation now existing between the collector and district engineer might be retained with advantage; the former having a general superintendence of the works, and the latter being responsible for carrying out all orders. The employment of the civil staff in immediately supervising works seems objectionable, inasmuch as it necessitates other officers being appointed to do the ordinary district work; and in the lower grades it is better that outsiders should be employed upon superintending the actual relief works than that tahsildars should be deputed for this purpose, and their places filled by men new to the district. By making over the relief works to the direct superintendence of the district engineer and his establishment the civil staff of the district has some slight degree of leisure for systematic inquiries village by village. In the event of famine being either imminent or being actually present, Government will presumably in future, as was the case in the North-Western Provinces last year, have in readiness certain projects for execution in each district, and delegate to the commissioner power to authorise collectors to commence such works when necessary. On the work being started, the collector and district engineer should be in direct communication with each other, and it should be left for the collector to decide, with reference to his knowledge of the general state of each pargana, what works are from time to time to be undertaken. The district engineer, in his capacity of officer in immediate charge of the works, should be responsible for carrying out all orders of Government; but it will of course be the collector's duty to inquire frequently and ascertain whether all that can be done is being done, and to see that no departmental friction interferes with the attainment of the objects in view.

Mr. Webster.—Yes. I think that in cases where there is reason to believe that the distress is likely to be only temporary, the applicants for relief should be employed on the ordinary budget works under the Public Works Department.

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When distress increases and it appears probable that it will be more than temporary, special works should be opened; it would then be the time to take out the matured projects above referred to and put them in hand.

The work should, in my opinion, be so arranged as to collect comparatively large bodies at few localities. Supervision of every kind, professional, sanitary, organizing, &c., is only efficiently possible when the people are collected in comparatively large numbers. The system of having numerous small bodies of labourers on relief works scattered all over the country is open to every possible objection. Waste, peculation, and malpractices of all sorts can go on unchecked because of the almost impossibility of efficient supervision over such scattered bodies. I would place all such works under the Public Works Department, because the officers of that branch are in the habit of supervising works, and consequently know much better than the civil officers what amount of work a labourer is likely to be able to render, and are therefore far less likely to be imposed upon by persons desirous of getting the maximum of relief with the minimum of labour in return for it. I would work through the existing district and divisional establishment. Putting the works under the district engineer and his subordinates, ordinary and extraordinary, I would leave all arrangements primarily in his hands with one exception—the district officer should select the works for relief and should see them put in hand in order of their utility, as noted above. The district officer should be responsible that adequate arrangements are made for food supply and for payment of the labourers. Sanitation and arrangements for shelter should be left to the Public Works Department. If the district officer should be of opinion that the works are not being carried on satisfactorily, *i.e.*, that the rates are too high or too low; that the tests prescribed by Government are not being properly carried out; or that there is any other reason to be dissatisfied with the way in which the Public Works Department is doing its work, he should not issue orders direct, but should report at once to the commissioner of the division, who will depute his executive engineer to inquire into and, if necessary, to rectify matters.

Mr. Adams.—Assuming that there is still a prospect of saving the harvest, and that consequently the distress may be temporary only, I am certainly of opinion that as far as possible ordinary works only, *viz.*, those which would have been constructed in the ordinary routine from the budget of the current or the following year, should be used for relief.

I am most decidedly of opinion that the work should usually be under the charge of the agents of the Public Works Department.

With reference to the cause, "character of the people," I would point out that in this part of India the objection of the people to going to any distance from their homes for receipt of State aid is so strong that it will always, I believe, be necessary to recognize it in greater or less degree, and to supply work within what they consider a reasonable distance. But so far as is possible, having regard to this and also to the possible supplies of food and water, I think that labourers should be collected in comparatively large numbers. With large bodies supervision of work and proper adjustment of relief would be much easier than with a number of small parties of labourers often scattered at considerable distances from each other.

Mr. White.—In temporary distress, applicants should first be employed, as far as possible, on the ordinary works in progress in the district. At this stage there should be no test but that of full labour. As this source fails, relief works should be opened, and they would be all the better if situated in the distressed region and in the vicinity of the people's homes. The works should be professionally under the Public Works officers, but otherwise they should be under the orders of civil officers. The responsibility should rest on the district officer, but then he must be armed with full powers. The other queries in this question are better answered by higher authority.

Major Liston.—If the distress is only likely to be temporary, I am strongly in favour of employing applicants for relief on the ordinary works in progress. It must always be borne in mind that the cultivating classes have not only themselves and their families to support, but also to look after their bread winners, their cattle. If special relief works are at once opened and the famine rate of wages given, a cultivator must not only come to them himself but must bring his whole family, for what he earns is only sufficient for his own bare subsistence. On the ordinary works in progress, he may earn enough to support himself and those of his family whom he should leave at home to look after his cattle and any small amount of cultivation which may remain to him; and as long as the distress appears only to be of a temporary character and confined to certain portions of the district, the best mode of relief is to keep only the ordinary public works open and aid the cattle owner, if necessary, by giving small advances to keep his cattle alive; for if they die or the owner is compelled to sell them, the said owner becomes a beggar and a loafer on the works, and in the end Government is the loser. Once let a man lose his cattle, and there is, owing to the poverty of the district, no hope for him. I would at every risk keep the cultivating classes to their own legitimate work in this district as long as possible. I have discussed this question over and over again with the zemindars of this district, and their universal opinion is that when once a man gets accustomed to road work, he in many cases prefers it to field labour, and cultivation suffers.

With regard to tests I have had no experience. I would only open special works when the distress has reached such a height that the ordinary public works cannot supply sufficient work.

The experience of 1868–69 leads me to advocate the collecting of applicants for work in large numbers at a few localities; I found then that where employment was given to smaller bodies scattered over the district, the work was scamped, the people not properly paid, and money wasted. On the large works, though the said works were miserable failures as regards utility, the people were under the supervision of the civil officers, sufficiently paid and well cared for.

Such large works as I advocate should, in my opinion, be placed under the Public Works Department officers for work; but the civil officers should also exercise a general supervision.

Mr. Gardner.—Whether ordinary works in progress will afford relief depends on their character. Earthwork alone seems fitted for relief operations. The only works usually in progress are ordinary repairs of unmetalled roads. The sum allotted for these is very small, and the work is usually completed during the month of November. In most districts, however, there are unmetalled roads which require raising and improving, and the work is eminently suited for relief purposes. The same remarks apply to deepening of tanks. Abundance of works have been already selected and approved; all now necessary is the sanction and the money.

The system should be the same as at present. All large works should be under the personal charge of officers of the Public Works Department; minor works might be placed under the tahsildars (native sub-collectors) under the same restrictions as at present.

The great thing is to begin relief works at the right time, and to persevere in them. If relief works begin too late, the people get into a low state of apathy, in which they are unable and unwilling to travel from their homes, and unfit for and unwilling to work; they should be kept going long enough for people of the neighbourhood to be aware that work is to be got on them; if they are opened for a few days and then closed again they do no good, and when re-opened the people do not believe in them. At relief works I would have no tests at all as to fitness of applicants. All persons willing to work, and fit to work, should be admitted. If relief works have been taken in hand in time, few persons will have become debilitated or unfit for work.

Relief works at great distance from men's homes will attract only those classes which are in the habit of looking abroad for work; in this district the *Nunia* or "navvy" clan. If the work is to help the ordinary labouring classes, it must be opened nearer to the people's homes.

Mr. Daniell.—Where the ordinary district works are suitable to relief purposes they should be utilized as far as possible for relief. The tests must differ according to the state of pressure, the time of pressure at which works are set going to aid in relief, and the condition of the people. Special works would be open on failure of ordinary works to meet the necessities of the case. Arrangements must differ so much according to the numbers who attend the works. For large numbers, works should be, as much as possible, kept distinct; (1) for able bodies who can do a good task for their wages, and who will leave the work whenever their usual labour is in demand; (2) for inefficients who should be placed on lighter work, supported by relief camps, and by means to have medical supervision, and who would cling longer to the works than their stronger brethren. The class (1) would be particularly under Public Works Department; the class (2) would be ordinarily under Public Works Department. The civil and medical officers would, however, have a voice in the amount of work and general treatment of class (2).

So long as the classes are kept separate there is no objection to concentration of labourers. Petty scattered works are objectionable, except perhaps to meet an exigency to last over only for a very short space of time.

Colonel Fisher.—If I thought distress only temporary, or I was not satisfied that it was indicative of approaching famine, I should, having ascertained the area affected by scarcity, throw all the Public Works Department assignments for repairs, maintenance, &c., for the year into that area. If this did not suffice I should give the people (as elsewhere suggested) *takávi* advances on the security of *malguzars*, and make the people understand that the labour of each receiver of a takávi advance was hypothecated to me to the extent of that advance, and that I would allow each village patti, or pargana (they being collectively responsible) to work off the obligation undertaken as soon as my projects had received Government sanction. I would have no tests for applicants for relief; indeed, they would not be required under the system proposed, and tests are always more theoretical than practical, and are liable to much abuse with native agency. I do not approve of "special works;" they have the disadvantage of being constructed for a special purpose, and a tendency to be very useless, once that purpose (which was often only a temporary one) has been effected. In fact they are generally productive of wasteful expenditure, are seldom of permanent benefit to a district, are always prepared in the hurry and excitement of a pending crisis, and are practically past recall before the experience which famine gives has been gained. Under the system I propose special works would not be sanctioned at all, but fully matured projects after the strain of providing food for the people was over, and when all defects in lines of communication had been fully disclosed. If special works are to continue, then I consider the supervision of the labour and preparation of daily labour rolls should alone be entrusted to the Public Works Department; the payments to the people should invariably be made by the civil authorities. I speak with the greatest confidence on this point, as I tried it last cold weather with the most marked success. The Public Works Department overseers are thus removed from the temptation of entering paper men on their rolls, and there being no profit to be made in that way, they exact a much larger proportion of work. Of course no civil officer under the rank of a tahsildar should be employed in distribution of wages to the labourers. In Garhwál the district officer is also the assistant engineer, and the responsibility rests on him for seeing that all needful steps are taken by all branches of the public service. Under the system I advocate the selection of works on which takávi advances are due would be made after, and not before, the famine had taught us which were the works likely to be most useful or remunerative.

Colonel J. Reid.—The distance test is very necessary. Our rates of subsistence wages even are higher than would be given for ordinary field work in their villages; and when people can get work from us near their homes they very naturally prefer the more highly-paid Government employment. At this moment we find that very many persons go to their homes when ordered to a work at some distance from them, and in some cases at least we find that workpeople from localities in which distress is known to be exceptionally severe make no objection to a move. The general inference to be drawn is, that those who go away do not require—anyhow do not urgently require—Government aid, and that those who remain really are in want of assistance. As to the nature of works to be undertaken, this must depend upon circumstances; here there is no scope for large works, and we must take what we can get. The impression I formed when our relief works were first started was that some of the subordinates of the Department Public Works were rather too rigorous in exacting tasks beyond the physical capacity of some of the workpeople, and with regard to others did not make sufficient allowance for the fact that people, even in good condition, employed on work to which they were quite unaccustomed, could not perform what would be a light task to a skilled labourer. I may be in error, but as a matter of fact persons undoubtedly in urgent need of assistance did leave the works because of the tasks exacted from them; in some instances large numbers did. I am inclined to think that in some instances details of the distribution of work were not sufficiently attended to, and that the small out-turn of work was caused partly by this defect in the arrangements. It might occasionally be found convenient to place small works inconveniently situated under civil supervision, but our civil officers are fully occupied with their legitimate duties; few of them have much experience of, or speciality for, such operations; and as a rule I have no doubt relief works should be placed under the Department Public Works, the Deputy Commissioner retaining control as with respect to ordinary local funds works, and being responsible for seeing that all needful steps were taken by all branches of the public service concerned.

Mr. Harington.—To apply the distance test in a bitter January in Oudh is next door to manslaughter. To omit it in the warmer months is to throw away a valuable means of eliminating those who have not yet reached the stage of real distress. With the *proviso* that an infirm gang is always kept up and considerately enlisted, and that the supervising officer exercises ordinary intelligence, honesty, and fairness, the task system cannot be too steadily insisted on for those who can do full work. It follows that when the distress is only partial, small local works in the immediate neighbourhood of the sufferers are necessary for the months of December and January. Large ones are clearly advisable for the warmer months.

During the rains the expediency of large works is counterbalanced by the great risk of cholera. On the other hand much rain should soon do away with the necessity of relief works.

Captain Currie.—Employ those willing to work on ordinary works in progress. The test should be a full day's work for a full day's pay, with fines for short work down to a bare subsistence allowance. Special works to be opened if ordinary works were found insufficient to employ all who came to work. Such works should be arranged so as to collect the applicants in large numbers at a few localities at some distance from the villages of those coming to work never in small works close to the applicant's villages such works could not be supervised properly, and would only compete with the local labour market. All works should be under the Public Works Department rules and Public Works Department supervision. The district officer in this district has his public works officer next room to him, so that there is no difficulty as to communication. The works should be chosen by the Deputy Commissioner in consultation with the Public Works officer. The whole responsibility for seeing all needful steps taken by all branches should rest with the Deputy Commissioner, who should be fettered as little as possible in his action, and who should report fully to commissioner of division.

Mr. Quinn.—The measures I adopted were to open poor-houses at each of the tahsíli towns. This secured the supervision of a tahsíldar and hospital assistant. Municipal works sanctioned in the budget were taken in hand, and additional works projected; the district engineer was instructed as a tentative measure to take on at a low wage all who applied for employment on a few selected district works. When it was found that people flocked to these works, notwithstanding the low wage, and that many came from a distance, a few regular relief works were opened. This system of only extending relief works as the necessity for them was proved, worked well. The class who apply for work; their physical condition; the proportion to the whole borne by men, women, and children; and the distance the applicants have come from, require to be all carefully watched. As long as it is possible, I prefer that the people should be given work within a reasonable distance of their homes, and have at least the option of returning to them at night. When famine increases in severity, large works must be set on foot, and this requires the assemblage of workmen in large bodies. To these works I should draft off the able-bodied men and women, under the inducement of a higher wage, leaving the weak and infirm, and those encumbered with families, to be employed on petty works near their homes; but as regards an absolute rule that all relief labourers are to be employed in large bodies and to be hutted, it should be borne in mind that huts are built for those who leave homes of their own; that the sick, the old, the infirm, and young children have all to be dragged to long distances from their homes, or else a special and expensive village organization has to be made for their maintenance and attendance, during the absence of their natural supporters, and that camps, if epidemics are to be guarded against, require special sanitary arrangements and medical supervision. I do not think it would be wise to incur all this expense, and to put the people to so much hardship, simply to secure a test that those relieved were really in want. The special works to be opened should be selected by the district officer in consultation with the district engineer. All relief works should be under the Public Works Department, and the head of the district should be generally responsible.

Mr. Blennerhasset.—If the district officer believes the distress to be only temporary, relief can be supplied by employing people on road repairs and similar ordinary works in progress, both district and municipal. The tests should be the ordinary ones, and the distance test should be applied if possible.

Special works should be opened if the ordinary works are insufficient to keep the people from starving. The special works should be as few as possible, so as to admit of good supervision, and not near the houses of the applicants.

A combination of public works and civil supervision appears preferable to handing the works over entirely to either department. The Public Works can enforce the labour test better than civil officers, and the civil officers are better qualified to see that no one in want is refused work. The Public Works officers in this province are already in close connection with district officers; the latter should select the works for relief, and the chief civil officer of the district should be responsible for all officers working at their respective duties.

Mr. Lumsden.—Before it is known whether incipient distress and dearth of employment will or will not merge into famine, all applicants for work should be employed on the ordinary local and municipal works which may be in hand. Contract work should be put a stop to on all such works for the time being (I refer to works suitable for the employment of unskilled labour), and special arrangements made for carrying on these works by the people who come forward and ask employment at subsistence rates.

At this stage I would not apply any special test for admission; task-work should, however, be rigorously exacted, the wage kept down to mere subsistence rates, and the applicants for work should be required to provide their own tools, baskets, &c.

When the number of applicants for admission on these works become excessive and the symptoms of distress increase, special works previously selected as suitable and held ready for the occasion should be opened.

While the numbers, though beyond what could be employed with advantage on the ordinary works in hand in the district, are still manageable on minor suitable works specially selected, and there is any hope that the pressure and distress are of a temporary nature, and will shortly either disappear or at least greatly diminish, I am decidedly of opinion that it is more politic to employ comparatively small bodies of people at a number of works in the distressed regions than to concentrate large bodies at one or two heavy works.

While there is any reasonable hope that the pressure will pass away, it seems to me very bad policy to require the applicants for employment to leave their homes and move away to distant works. A native is usually averse to leaving his house or village, and his readiness to do so in order to obtain employment on subsistence wages at a distance under task-work rules, is most certainly one of the best tests we have of the reality and severity of the pressure; and it must be remembered that at what may be called the *slack* season even in ordinary years there are a large body of people who would flock to works opened near their houses at our subsistence rates of wage; but bearing all this in mind, it must not be forgotten that it is those natives who once leave their homes and take to our large works, bringing their little all with them, that become the "*habituals*" on our relief works, whom it is so hard to get rid of even when the times improve.

It is objectionable, therefore, in my opinion, to make *any of the classes* who come on our works leave their homes at this initial stage, while there is hope of the distress proving temporary, and the number of applicants are still, with reference to what they will be should the pressure continue, comparatively few; and it is specially objectionable to make any of the actual cultivators of the land, a few of the poorer among whom will generally be found to require assistance, move away to works at any great distance from their villages, for while there is any hope that the pressure will shortly diminish, or that any change in the weather might afford the cultivator profitable employment in his fields, it is manifestly advisable, if possible, to provide *him* with work within a moderate distance of his village.

As soon, however, as the numbers increase to such an extent that it is difficult to provide suitable employment for them on small works of the description

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alluded to, or to provide the necessary establishment for supervision and management of a large number of such works scattered over a district, and particularly when it is almost certain that the distress is on the increase and must last for some time, say until the next harvest is reaped, it then becomes expedient to concentrate the people on large works at a distance from their houses, providing for each work a suitable staff of Public Works Department and civil officers. Concentration will at this stage be a decided advantage: it will keep many off the works who would come on them were they within easy reach of their homes, and it will be more practicable for the Public Works and civil officers to make the necessary arrangements for supervision, management, payment, and the procuring of supplies, when the large body of labourers they will at this stage have to deal with are concentrated at one or two centres.

As regards relief works being under Public Works officers or civil supervision, I am decidedly of opinion that as soon as *special* relief works are undertaken they should be under the supervision of officers of the Public Works Department.

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Mr. Barlow.—The usual practice, which appears to be the right one, is to push on ordinary district works of all kinds and under all departments. These works are tentative. No particular tests are applied. All applicants are admitted at the ordinary wages of the district. If these works draw an unusual number of people, and the condition of those who come is bad; in short, if the reality and extent of distress becomes marked, then the next step is to open what are called relief works in places where, probably in respect of the most serious failure of the crops, distress is severe, and which are beyond the reach of the aid afforded by other works. The question of whether such relief works should be few or many, and how they should be arranged according to locality, must of course, depend upon the degree of distress; but it seems to me to be already decided that a restricted system should, as far as possible, be followed, by the consideration which we have in view, that the distress is supposed to be temporary. I think that it is only when distress approaches, and is manifestly progressing into famine, that considerations of economy and security against abuses can afford to be disregarded, and as a matter of convenience to the people themselves, work can be arranged so as to be available at every man's door. In the case before us, work might be provided at a few convenient centres, so that willingness to go some distance from home to obtain employment might be used as a test of the necessity of the people frequenting the works. Under the present system in Bengal, where the duties of the officers of the Public Works Department are confined to provincial matters, the question as to any choice between departmental and civil supervision for these works could hardly arise very early; unless the distress had passed rapidly beyond the management of the local authorities, and Government had stepped in with special measures and organization. In ordinary cases intervention of the kind would not occur until famine was deemed to be approaching. Wherever and whenever possible, however, I prefer the conduct of works by the Public Works Department under an energetic European officer constantly upon the spot; because I believe a better return for the money spent is obtained. Under civil supervision, such as it is, there is great waste of money. The chief argument in favour of civil works is that the Public Works Department cannot deal with people deteriorated and wasted in physique; this should not apply in the case of distress believed to be temporary. The district officer must certainly be the person upon whom the responsibility rests in the district, for seeing that all needful steps are taken by all branches of the public service concerned. This fact, as far as my experience goes, has already been so far acknowledged that no want of accord or friction between Public Works Department officers and district officers, has been practically felt in carrying out relief works together. Certain relaxations of departmental rules are allowed under the necessities of the case, and after the outline of the system for working to be followed, and the responsibility attaching to both sides, has been laid down by Government, the common superior, it is found to answer. One thing only is essential, and I believe has been observed. It should anyhow be provided for by a strict rule in any famine code. If anything special and unforeseen occurs or has to be provided for, the officers of the Public Works Department after consultation with the chief civil officer, must accept his decision, pending orders of Government. This is necessary to guard against a deadlock.

Mr. Worsley.—When a district officer believes distress to be temporary, he should afford every opportunity to applicants for employment on the ordinary works in progress *at the ordinary rates.* If the applicants become so numerous that these works cannot receive them, the district officer should open special works in different localities at the ordinary rates. The only test of admission should be willingness to work at the ordinary rates. The works should be under civil supervision, and should consist of thorough repairs to existing roads. They should be opened in such a manner that any villagers might obtain employment within three or four miles of their houses. It is in my opinion a great mistake, except in time of severe famine, to open works close to the people's houses. If, for instance, I had reason to believe that the whole length of country between Seetamurhee and Mozufferpore was in a state of distress throughout an average breadth of six or eight miles, I should consider it sufficient to offer employment along the whole length of the Mozufferpore Seetamurhee road in the first instance. The villagers who happened to live near the road would of course have an advantage over others; but the advantage would arise from accident, not design. I have had very little experience of the Public Works Department in time of famine. A few small works were under the Executive Engineer, Mr. A. Urquhart, in Mozufferpore Sub-division in 1874, and others were under another Department Public Works officer in Tajpore Sub-division; but the systems under which civil officers and Department Public Works officers employed labourers differed more in name than in practice. Relief works should be selected by the district officer, who should be held responsible for taking all needful steps.

Mr. Magrath.—To my mind the work should be special under special Public Works staff. It should not be brought near the people's homes or made easy for them. I do not think any test is necessary when men are properly supervised and bare subsistence is given as wages.

I have already said that I considered it in every way undesirable to mix up famine relief works with other works. They should be arranged so that the work may come to be permanently useful, and under skilled supervision of officers of the Public Works properly appointed and in sufficient numbers. They should not be taken to people's homes, and should employ as many people as is convenient for the staff to supervise. If many works are carried on, skilled supervision becomes very expensive, and people are led to wander about and see where the work is lightest. Besides this, if the people are near their homes, facilities are given to them to shirk their work and only come to be counted, or at least to idle at home if the officer in charge is absent at any time. The cry of demoralization and a tendency to pauperize the people raised in 1874, with regard to the large works, was utterly disproved. The people returned to their fields from the large works as soon as the cultivation of the crops came on, but tried to keep up the small local works to spend any leisure time they might have. I think I may safely say that the experience of all sub-divisional officers was against small local works as giving opportunities for idleness, peculation, and scamped work that did not exist where the larger works were properly officered.

I cannot conceive how there can be any doubt about the employment of Public Works officers for the purpose. The work is such as they alone are technically acquainted with, and they alone can supervise efficiently. The Public Works officers should be responsible that the work given to them to do is efficiently done. The picking out what works should be done would rest with the local authorities. If the Public Works officers are of opinion that they can only efficiently employ a certain number of people on a particular work, they should acquaint the local authorities, who would fix upon such other works as may be necessary. No responsibility should rest on the Public Works officials, except seeing that the work is properly done and the labourers regularly paid. All other matters should be the work of the local authorities. No difficulty was found in 1874 in their working together. In picking out works those should invariably be selected which have already been properly planned, and, if possible, sanctioned by Government.

Mr. Hodgkinson.—If the distress is likely only to be temporary, it is possible that employment may be found for those requiring it in the ordinary works in progress under the Road Cess Committee or municipalities on the usual wages at first. The opening of special works indicates a greater degree of pressure, and consequently a lower calibre and morale in the applicants for relief; then other tests must be employed. What tests are best will be discussed later on in dealing with chapter III. Special works should, as a rule, only be opened when it is found that the administration of the ordinary local funds is not likely to afford work on a sufficiently extensive scale for the requirements of the people.

In a district where for agricultural purposes labour is being constantly wanted, it is very much better that the works should be small and numerous, so as to keep the people near their houses to resume their ordinary occupations as opportunities offer. The difficulty, of course, is to have efficient supervision in Sarun. The different indigo planters have afforded material help to Government officials in this respect. In the earlier stages of the distress I should certainly prefer scattered works, if there was a reasonable prospect of the distress being only temporary and not resulting in a real famine. If, however, a real famine appeared imminent, the large sums of money necessary to meet it could not be advantageously and economically spent on small works, and the difficulty of supervision would be much enhanced. A canal, a railroad, or some such large work should be commenced, which would have the advantage of concentrating the workpeople along a long line of relief, and be of material use in averting or coping with future famines. From the nature of the work it would be placed under Public Works officers, but the officers in charge of it should be required to submit to the district officer periodical reports of the numbers and conditions of the labourers, and of the progress of the work, along with indents for the grain, &c., required for the purposes of payment. The district magistrate will be generally responsible for the administration of district in relief matters, except in cases where it may be expedient to divide the district and appoint a special officer for the purpose of famine administration.

Mr. Toynbee.—If the distress seemed likely to be only temporary, the ordinary works carried on by the district engineer from Road Cess Funds would probably suffice. If it seemed to the district officer that something more than these should be undertaken, he would arrange with the district engineer to open some special work suited to the circumstances of the case, taking especial care that such work should be of real and lasting benefit to the district, and not the mere throwing up of earthwork where it was not required.

If distress appeared likely to turn into famine, it would then be necessary to ask for aid from provincial or Imperial funds, and to commence some great and lasting work, the plans, &c., of which would presumably be ready beforehand. In the last-named case the Public Works Department would have the supervision of the work; in the two former the civil authorities, advised by the district engineer.

In all these cases it would be advisable, for the sake of better supervision, to hut the labourers on the works. When first opened, the work being task-work, all comers would be employed at ordinary rates. No test would be requisite. Special works should be arranged, not with the main object of suiting the comfort and convenience of the people, but to ensure the expenditure of money on a lasting and permanently beneficial work. Such a work, once begun, should not be left to be completed when another scarcity occurs; but should, so far as is possible, be made useful and remunerative at once. The primary responsibility for all measures of relief within the district should rest on the district officer; but he should have extra aid and establishments allowed him, so that his ordinary work might not suffer by the pressure. He should, if matters assume a more serious aspect, be set entirely free from ordinary routine work, and the help given him in the way of an extra staff would better be employed in ordinary work—those officers who had been longest in, and had gained most experience of, the district being set free for famine work. His right-hand man, as regards works, would be the district engineer. For the supervision of charitable and other forms of relief he would require active and experienced native deputy collectors or others.

Mr. Finucane.—The winter rice crop of 1875 was seriously deficient in a belt running along the Nepal frontier and extending through the Soopool, Madhubani, and Sitamarhi sub-divisions. The failure was most marked in the northern half of Alapur, where such competent authorities as Messrs. Geddes and MacDonnell described the rice crop as an out-and-out failure. In the southern half of the pergunnah the crop was probably an eight-anna one. The part of the pergunnah where the crop was most seriously deficient included an area of somewhat less than 100 square miles, with a population of 30 to 40 thousand persons. The only measures of relief which it was found necessary to adopt were—

1st. Distribution of gratuitous relief to old and infirm persons.

2nd. The expansion of ordinary road works in progress under the Raj engineer.

3rd. The stopping of rent realizations.

4th. Small advances for seed grain.

All applicants for employment were admitted on the road works and were paid at ordinary contract rates, which in this tract were so very low that an ordinary labourer could not earn more than 1½ to 2 annas a day. Light labour gangs were also formed on these road works; women and children and weakly persons were admitted to these gangs, and paid a daily wage of from four to six pice. The works were carried on by the Raj assistant engineer at contract rates and under the ordinary departmental rules. As civil officer on the spot primarily responsible, my duty as regards these works consisted in seeing that the labourers were regularly and fairly paid; that all comers were admitted; and also in deciding whether particular individuals were sufficiently strong to be put on piece works, or whether they should be admitted to light labour gangs. In addition to relief by employment given on road works carried on by the Raj engineer at the expense of the Durbhunga estate, employment was also given on tanks, of which large numbers were made by jeyt ryots (village headmen) at their own expense, or from sums advanced by way of loan, which sums have been since repaid.

Mr. Mackie.—If the district officer believes distress will be but temporary, he should employ applicants on ordinary works just as in an ordinary year. If the applicants, however, largely exceed the numbers the works can accommodate, he should open a few special works in detached localities where rigorous task-work will be enforced, and so situated that the majority of workers will necessarily have some distance to travel before they obtain employment. These should be of such a nature that they do not commit Government to a very large expenditure, and yet they should not be so numerous and widely scattered as to render close supervision by the ordinary establishments a matter of difficulty. I would place all works, so far as regards professional details and payment, under skilled supervision, leaving their selection to the revenue officers. I would place no restriction on the admission of applicants.

Mr. Kirkwood.—Even when only a one-third failure is assured over any considerable area, if there are no works in progress, arrangements should be made for opening works whenever a demand for employment may arise. This should be done even before the harvesting of the crop. These works should be conducted on the same principles as ordinary works. Where there are local works in progress under any of the public departments which employ labour, applicants should be sent to them. When the failure assured is greater the works will have to be more numerous. In the first months of distress, works should be opened in a comparatively few localities in the distressed parts. These should be large and important works. Directly distress appears to be deepening by unusual numbers flocking to these works, some of whom come from some distance, or are not ordinary earthworkers, works should be multiplied throughout the distressed region. When the distress shows itself to be of such a nature as would amount in many instances to starvation, if it were not for Government intervention, works should be opened to such an extent that every large village should have some work available within a distance of (say) four miles. For this purpose long works, such as roads or canals traversing the distressed tracts, are much better than tanks or reservoirs. Work should be simultaneously commenced at several places throughout the length of a road or canal, such places being about six miles apart, and the villagers going to the gang nearest their village. All these works should be under the Public Works officers, and every sort of human being should be admitted to them, the only condition being that for so much work he or she gets so much pay. The rate of remuneration should be raised with the increased price of grain. When prices approach double ordinary rates, the pay rate on these Public Works Department works should be somewhat raised. When prices are nearly two and a half times their ordinary figure, the rate of remuneration should be 25 per cent. in excess of the ordinary rate; the difference being left for the labourers to make up by increased work, economy, and abstemiousness. When the price of food is about trebled, the rate of pay should be increased by 33 per cent., and when quadrupled, or nearly quadrupled, by 50 per cent.

At the same time, when still increasing numbers applying for work, many of those persons not being ordinarily engaged in that capacity, and the price of food rising to nearly three times its ordinary rate, show that distress must be getting severe, separate works should be opened in the vicinity of every village for light labourers. These light labour gangs should be under the control of civil officers. They should not be at work within two miles of the other gangs, but, with that reservation, they may well be employed on the same sort of earthwork as the other gangs; accuracy of slopes and dressing and turfing being, when desirable, left to the subsequent attention of the regular departmental officers. Into these gangs no man or boy above 12 years of age should be admitted unless his physical appearance plead for him; from them no woman (except a few professional earthworkers) or child should be excluded. Task-work should be strictly exacted. The rate paid should be about 50 per cent. in excess of the rate paid at the same time on the Public Works Department works; but, in all other respects, these light labour works should be carried on upon the same principle of "no work, no pay." Of course such women and children as may desire to do so could go with their male relatives on to the Public Works Department works and work at Public Works Department rates. The two classes of work may, with perfect propriety, be going on at the same time, not only without interference, but with mutual advantage. These weak-body gangs should be under civil officers, because they are more likely to be free from rigid departmental doctrines, and to remember that the very essence of the object of the works which they are supervising is the saving of the lives of those who are feeble or unaccustomed to earthwork. To that idea must be subordinated excellence of work and economy of construction, both of which objects should nevertheless stand well forward in the mind of the supervising official. To encourage into energy the listlessness of incipient starvation, and while that encouragement is going on, to dole out some small extra reward to the struggling new comer, will have a large call on the attention of the supervising officer. When anyone first joins a relief work in anything approaching an emaciated state, he or she should generally be given food or money sufficient for a few days support; during this interval some little work is done, something is earned, and strength is gained; with these earnings the earnings of the next week are supplemented, and by that time probably the recipient will be in a position to earn enough for self-support. Sir George Campbell in his evidence before the Indian Works Parliamentary Committee has recently expressed a weighty opinion against the universal application of task-work in famines. He thought that, when the people were emaciated, any such test would lead to the people refusing work; for it would be impossible to distinguish between what work one man could do and what another. I would venture to say that such discrimination is possible to such an extent as I have above noted, and that that is all the discrimination required. The experience of two famines has taught me this; and where than in Orissa could emaciation have been greater? Under such a system as the above, which was worked successfullyin those two famines, I believe that no one who can work will refuse to do so. Very many in want cannot, owing to physical or caste inability, come on to earthworks; some, as mothers with children at their breasts, it is not wise to ask to come; but all others will readily come. For the residuum work of a suitable nature like spinning and weaving must be provided, or relief must be given gratuitously.

For all works and all branches of the public service during times of famine the collector of the district should be responsible. This should continue to be the case even though he is provided with the aid of a civilian co-adjutor of ample experience to take charge of the famine department of his district cares. Differences of opinion between that co-adjutor and any other department should be referred to the collector. The Public Works Department works would be subordinate to the control of the collector,

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as to the localities where they are to be opened, the rates to be paid upon them, the persons to be admitted to them, and the frequency and manner of payment. Any important differences of opinion with other departments in his district or with his co-adjutor, of which the collector cannot himself satisfactorily dispose, should be referred by him to the commissioner under whom he may be. To each much distressed district there should be attached at least one officer of the standing of an executive engineer, who would take the instructions of the collector, and be responsible to him for the conduct of the Public Works Department works in the district in every respect, except professional correctness and excellence and the control of accounts. On those points the executive engineer should be responsible to his superior departmental officers.

Anything in the shape of a distance or poverty test before admission to the works appears to me opposed to both humanity and economy. I regard a distance test as an invention which is pernicious in every way. If people have to return to their homes, it wastes valuable time which might be expended in earning money. If they do not return to their homes, it exposes them to nights of damp and cold, an exposure which works ruinously on enfeebled frames (*vide* Sir George Couper's opinion on the North-West Provinces mortality of last winter). Many will refuse thus to emigrate from their homes, and will prefer to face death at home, together with their female relatives, to leaving their women and children desolate and helpless, and to wandering forth themselves to face unknown ills in an unknown country on unknown work among unknown people. The evil of the women and children accompanying the males of their families in this emigration movement is hardly less. Without a home to sleep in the women, if they survive, rapidly degenerate morally, and the children often fail to stand the exposure. The cost of hutting is great, the home falls into ruins, the odds and ends by which, at home, even in the worst times, life is to some extent supported have no existence. As for driving persons possessed of any property or in good physical plight from the earthworks, it seems to me a plan deserving of nothing but condemnation. I venture to regard the introduction of that plan as a serious error in the administration of the recent famine in Bombay and Madras. It seems to have been regarded as a subject for regret rather than for deep congratulation that so many were early in the year flocking on to the works in search of employment, instead of wasting away and dying slow deaths at home after parting with the remainder of their little all. Let but task-work be insisted on, and one has an unrivalled test of want. It seems to me to be much more economical to have these people in January in good plight on the works than to drive them off then to return, if still alive, two or three months afterwards with emaciated frames. They will themselves then be able to do but little work, and they will have left at home a starving wife and children, who must then be relieved gratuitously in whole or part, but who would have eked out existence till better times on the small family belongings, had the male members of the family not been driven home to help them to consume all their possessions in enforced idleness. I think there is scarcely room for doubt that a grievous degree of avoidable distress, and perhaps mortality, must be laid at the door of such a measure as this, whenever it is essayed.

Mr. Brookes. — The early applicants for work should be referred to the ordinary public works in progress. Municipalities and the Road Cess Department should be able to meet the demand when only temporary distress was occurring.

The labour test would be the best, as least likely to disorganize the arrangement of the works in progress.

Special works would only become necessary when the local fund works did not provide sufficient employment.

Small special works, not requiring the supervision of trained officers, could well be undertaken by the civil officers, assisted by non-official persons; or the district officer might have the services of an assistant engineer placed at his disposal to assist him in his arrangements for work, and the best method of carrying it out.

More important special works.—These, if arranged in too convenient proximity to the homes of the distressed, generally draw persons who are not in urgent need of relief.

It is better to arrange for comparatively large numbers in fewer localities. The labour is then more manageable; more useful work can be undertaken in this way, and with less cost for supervision.

Undoubtedly such works should be placed under the Public Works Department, where trained officers and subordinates could see to the work being properly carried out and without unnecessary expenditure.

Civil officers are placed at a great disadvantage when entrusted with such work, and although they may often be amateur engineers themselves, they cannot convert the temporary subordinates they entertain for the occasion into men of experience and ability, so that the work soon gets into confusion and all check is lost.

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Mr. Hewlett.—I think that when it is clear that on account of the failure of rain there will be a scarcity of food grains, and when the price of grain has risen so that only 24 lbs. or 26 lbs. of grain can be purchased in the villages for a rupee, and if the market shows a tendency still further to rise, then the sooner relief works are opened the better. I am certain that by taking this action in the commencement of the late famine the Government has saved thousands of lives, for by it the people were prevented from sinking into such a reduced condition that aid, had it been longer delayed, would have been of no good to them. I also think that this action is the most economical to Government in the long run, as the people would then have some little stock of money which would supplement the Government rates and prevent the large majority of them requiring special treatment. I think that when it is determined to open works, all such should be under the officers of the Public Works Department. The organization under them, as far as my experience goes, is more effective, and the medical supervision becomes much easier by concentrating large bodies of men on works of permanent utility. In certain cases it may be desirable to have road works or the clearing of small tanks under civil officers, but I believe that the civil officers would be more usefully employed in inspecting villages, in drafting men and women requiring State aid found in them to large works than in supervising road making.

By this means you have all the people of a district under one management. Of course there can be one or as many more works in a district as occasion demands, but I am certain that for effective administration this plan, if adopted, would be found easier and more economical.

During the late famine the utmost difficulty was felt by the medical department in meeting the demand for medical subordinates, and the strain on it was excessive, but by concentration of large bodies in suitable camps, and I beg by this to carefully guard myself from any imputation of wishing to overcrowd camps, a more efficient supervision could be kept by the officer in charge over the labourers, whilst the medical subordinates would be able to devote them-

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selves to the treatment of the sick, the elimination of weakly and reduced persons from the different gangs by frequent inspections, the separation into classes of those who require special treatment, and the general superintendence of the relief houses and kitchens. I should gladly have recommended for sanitary reasons that the weakly gangs should have been kept in villages and employed in village sanitation under civil officers, and in fact I did recommend this course at one time during the late famine, but it was pointed out it would demoralize the people, that efficient supervision would be impracticable, and that it would be impossible to prevent fraud, and in these conclusions I am obliged to concur.

Mr. Hart.—As regards temporary distress measures, my opinion is that at first the ordinary works in progress should be used for relief purposes, but provision should at once be made for special works under trained organization, for which large public (especially irrigation) works under professional supervision are best suited. On these large centres all relief labour should be concentrated as soon as all hope of averting famine is at an end.

However, till famine has completely declared itself, and while there is hope of agricultural operations being resuscitated by rainfall, local works are the more suitable as tending to keep the agricultural labourers on the spot, so as to take immediate advantage of any opportunity that might offer of obtaining a crop.

The arguments in favour of opening large works under Public Works officers are that such officers are professionally trained to the management of large bodies of labourers, and that on large works, engineering skill and technical knowledge will be required to conduct such works with economy and success.

Public Works officers may best be placed in direct communication with local civil officers by the heads of their departments, and the working of the whole should be supervised and controlled by a special officer in direct communication with the Government.

The responsibility of all operations should rest with the revenue commissioners and the chief or superintending engineer.

The selection of works should be on the principle of convenience, concentration and permanence of the employment likely to be afforded; in addition, of course, the elements of facility for shelter, healthiness of locality, and suitability of water supply must enter largely into the consideration.

Colonel Jenkin Jones.—The collector should request the executive engineers of the general and irrigation branches to provide employment for distressed persons on the public works in progress; and if necessary to start some new works for the special purpose.

Applicants should at first be employed on the ordinary works in progress, the able-bodied persons under the Public Works officers and the weaker ones under the local officers. The assistance of the municipalities should also be asked for.

As to test for admission, the civil officers of the district should make careful inquiries through the village headmen, as to the condition of the applicants for relief.

Special works should be opened when the ordinary works in progress are not likely to afford sufficient employment for the distressed persons.

It is preferable to employ the able-bodied people in large numbers at a few localities, the weaker people only being provided with work in smaller bodies in the neighbourhood of their homes.

As far as possible all relief works should be under the Public Works Department. Only petty works, such as the clearance of small village tanks, clearing tracks, and cutting prickly pear, &c., being left to the civil officers.

The officers and subordinates of the Public Works Department are from the nature of their ordinary duties better fitted to organize and overlook the labourers than the district officers.

The Public Works officers should consult with the Revenue officers as to the selection of new works to be started, the supply of food, and the applicants for relief.

Responsibility should be divided between the collector and the executive engineers, the former to ask for what is required in the shape of relief works, and the latter to carry them out.

Mr. Spry.—The district officer, supposing the distress to be only temporary, might first employ all applicants on such ordinary works in progress as required only unskilled labour. Should these works not appear sufficient, he might re-appropriate to similar works all grants entered in the sanctioned budgets for works requiring skilled labour, or which are otherwise unsuitable. On all such works both distance and task tests should be strictly enforced, also none should be admitted unless they brought certificates from the *taluka* or village authorities that they really require work. Special works should not be opened till it appeared that the works above enumerated were unequal to the demand, and the special works should be centralized as much as possible. A number of small works scattered about are difficult to supervise, and only demoralize. I am in favour of works being under the Public Works Department alone, as my experience shows me that civil agency fails after a very moderate limit. The civil officers have neither the knowledge nor competent establishments to deal with civil agency works, consequently a maximum of expenditure with a minimum of results ensues. The Public Works Department, on the other hand, know what work should be done, how it should be done, and whether it is properly done. The Public Works Department officers also have greater experience in enforcing discipline amongst the people on works. Besides this, in times of distress civil officers have many other important subjects to look to which are quite sufficient to absorb their time. As in general and important matters there is direct communication between the collector and executive engineer of the district, so in all matters of routine and in petty matters there should be direct communication between the civil officers in charge of talukas and the assistant engineer in charge of works situated in those talukas. But to prevent misunderstanding and clashing, there should be rules framed, suitable to the circumstances of the case, distinctly defining the province of each. Nothing is so likely to cause disaster as want of unanimity between officers of the respective departments.

The Public Works officers, in selecting works for relief, must to a great extent be guided by the civil officers, who are the best judges of the requirements of the district. On the collector, subject of course to the control of the commissioner, should rest the main responsibility.

Mr. Charles.—In organizing special works there can be no doubt that there should be always two classes of works dependent on each other, viz.: a civil work for the weak, and a Public Works Department work to which the civil labourers should be regularly sent as soon as they have regained strength.

To prevent confusion, the civil officer should have the final power of settling on which work a labourer should be.

The collector is undoubtedly the person on whom the responsibility should rest of seeing that the needful steps are taken by all branches of the public service.

Mr. Percival.—A very small pressure may be met by arrangements on the ordinary works under the Public Works Department and Local Fund Establishment; but as soon as it is certain that great numbers must be employed, large works under the Public Works Department should be opened. They should

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provide work for large numbers at a few localities, otherwise the tests cannot be applied. Civil supervision in this district has neither means nor knowledge to control large works. The responsibility that sufficient works are provided rests with the collector, who must keep Government informed of what is required. The Public Works officers in charge of works must receive all persons sent by the collector, who is the judge to decide if a person is to be required to work or not. It is not unnatural that officers in charge of works should dislike having to take on people who cannot do a fair day's work, but if the collector sends people of feeble physique, the engineer must employ them according to their strength.

Mr. Propert.—Until the extent of severity, probable duration of the famine or scarcity has been as far as possible ascertained, all applicants should be employed on the ordinary works in progress as far as accommodation is available; if such works become crowded, special small works should be opened under civil supervision, the rate of pay on which should be fixed at the lowest possible figure consistent with the preservation of life. The acceptance of these very low rates of pay precludes, in my opinion, the necessity for applying a further test.

I have in the last answer described the circumstances under which *small* special works should be started. The opening of large special works must depend upon the demand for employment at low or famine rates of pay.

It has I think been clearly demonstrated during the late famine that all able-bodied labourers should be gathered together and employed on a few large works under the supervision of the Public Works Department, and that as far as possible they should work according to the ordinary rules of the Department.

The Public Works officers in charge of *famine* works should act in communication with the collector exactly in the same manner as the district executive engineer does with the district officers in *ordinary times.* Special works in times of famine do not, I think, require any departure from ordinary departmental rules.

It is to be hoped that from the present time works will be selected in every district for execution in times of famine or scarcity. There will then be no indecent hurry or confusion when the evil hour arrives.

The *general* responsibility on account of all remedial measures to be adopted must devolve upon the chief civil officer, *i.e.*, the collector. After full instructions have been received by members of departments, the departmental head must see that the officers immediately under his direction perform the duties assigned to them.

Mr. Norman.—In case of temporary distress, it is not, as a rule, necessary to open special works. All ordinary works should, as far as possible, be commenced, which should be carried out on a system of task work. If the distress increases, it may be necessary to attach famine gangs to these works, where those who are too emaciated to do a day's labour would receive a bare subsistence allowance. A hospital should be attached to each large work, where cases of sickness can be attended to. It may also be necessary to open a small relief list in order to feed the cripples whose relations are on the works. All works should be under Public Works agency.

When it becomes necessary to open special works, which will be the case as soon as the ordinary works are overcrowded, such works should be as large as possible, and should be started in well selected localities in different parts of the distressed area. Applicants for relief should not be employed near their homes.

All such works should be placed under the Public Works Department, because the officers of that department are best able to supervise large gangs, and because under professional superintendence the works are better carried out and less money is wasted. Civil officers, from want of training, are not fitted for supervising large public works. The executive engineers should, in communication with the collectors, select the works best adapted for relief, and they again would act under the immediate orders of their superiors, the commissioners and the superintending engineers. The responsibility of representing what measures are needful for the relief of distress must, in the first instance, rest on the collectors. The orders for the necessary works can only be issued by Government.

Mr. Moore.—I should arrange for sending applicants for relief on to the ordinary works in progress.

Applicants for relief should apply to the *Mamlatdár*, subordinate judge, sub-registrar, and chief constable, or other officer appointed for the purpose, who after satisfying himself that the applicant really is in want, should give him or her a pass on to some work.

If the ordinary works in progress are insufficient to meet the pressure, I would open a large special work; this is the best kind of relief, as it is not demoralizing.

The special works should be arranged at convenient centres, so as to collect comparatively large numbers in a few localities. I most strongly object to small and scattered works in the vicinity of the applicant's homes. The distance test is the best, and there is better supervision and management if the relief works are few and large.

The works should be placed in charge of the Public Works Department. I should prefer that the Public Works Department officers should confine themselves to the execution of the work only, and that the management of the camps, and the admission and rejection of labourers, and the food supply, should be under civil officers, because the officers of the Public Works Department in charge of works are not all acquainted with the language of the district and the people. But I am aware that this arrangement has its drawbacks. Financially it would be more expensive, and probably it would come to this, that we should indent for officers on other presidencies and provinces, and the same difficulties would occur; so that, looking at the whole question, I think perhaps the entire management should be left in the hands of the Public Works Department.

I think that the Public Works Department officers should, in all matters except those which relate to the actual execution of the work, correspond with or through the collector of the district. This was not done in the late scarcity.

The Public Works Department officers should select their works in consultation with the collector.

The collector should, of course, be mainly responsible for seeing that everyone does his duty, but if the entire management of the works, and the admission or rejection of applicants and their food, &c. are placed in the hands of the Public Works Department officers, they would resent interference. I therefore think that all Public Works Department officers in a district should, in a time of scarcity, be considered, in all except scientific matters, as assistants to the collector.

Mr. Robertson.—If a local officer believes distress to be temporary, and is not satisfied that the distress is indicative of approaching famine, he should,—

1st. Establish village to village inspection by appointed officers, so that all bad cases may be got at and sent to a relief camp, and those requiring labour sent to some public work not too near to their homes.

2nd. He should establish a relief camp under proper supervision, where all who are not fit to work, or are sick, can be fed and treated.

As the people at this relief camp become fit for work he should weed them out, and send them with tickets for employment to works.

People should in all cases be employed on works under the Public Works Department, and, as long as distress is only temporary, on ordinary works in progress.

As regards tests for admission, the district officer or famine officer can easily tell if a man is fit to work. When a man is at a relief camp his fitness will be decided by the local officer and the medical man in charge.

As soon as it is seen that distress is extended, and that ordinary works cannot provide sufficient employment, then special works should be opened.

Most certainly the works should be so arranged as to employ large numbers at one place in such case, and then only is proper work and proper supervision obtained. If the works are scattered, Government charity is sure to be misapplied; numbers who can maintain themselves, but who will not move to a distance from their villages, will by joining works near their homes obtain relief when they ought not to receive aid. There will and can be no proper supervision and organization at scattered works, and thus dreadful cases of distress may arise.

As a rule, all famine relief works should be under Public Works agency. Only the aged and those not physically able to work properly should be employed under Civil supervision.

In a district the executive engineer, either for roads or irrigation, is always in official relations with the collector; while again when famine works are in progress, the assistant executive engineer or other officer is in communication with the assistant collector. An order from Government that the district officers and public works officers are to work in cordial co-operation is all that is requisite.

The collector, advised by his district officers, will communicate to the Public Works Department officer the taluka or portion of a taluka where some relief work is required, and the Public Works officer will use his professional skill in selecting a work, or probably there may be plans ready for works in that locality. If any particular scheme should appear feasible to the district officer, the collector would bring it to the notice of the officer of the Public Works Department.

The responsibility that the works are being properly executed, and proper order, &c. maintained on the large works under the Public Works Department, will rest with the chief executive officer of the Public Works Department in the district, under the control of the superintending engineer of the circle. But the responsibility as regards the famine arrangements, and that all needful steps are being taken by all branches of the public service in a district (*i.e.*, collectorate), will most certainly rest with the collector, while each collector will in his turn be subordinate to the commissioner of the division, who is the next officer responsible to Government.

Mr. Wingate.—Small vs. large works.—(a.) In the beginning of a famine, it seems of the first importance to determine whether the district is threatened with a local scarcity or is a part of a larger area about to endure a widespread famine; and in the latter case, whether the district lies towards the edge or the centre of the affected tract. Once the famine area is defined on the map, a glance will show whether distress is limited to a particular locality or not; and if not, it should excite suspicion if a district well within the smitten tract professes to feel little strain, while an over-anxious officer on the outskirts might safely be re-assured.

If the scarcity is local there can be no question of large works, and as long as an extension of ordinary works on more or less modified principles may be expected to tide over the difficulty, I would leave each officer pretty free to pull his own district through its troubles.

And I would adopt the same policy, only with more organization, where the scarcity is widespread but not severe, *i.e.*, trusting to small works, but holding larger works in readiness, and here and there, as necessity arose, opening a larger work.

But if once convinced that a real famine was impending that would almost immediately involve operations on a larger scale, I think I should avoid small works. They seem scarcely necessary, for after a crop fails there is much movement of people, disturbance of prices and even panic, but there is no danger of any immediate mortality: while experience teaches us that if the civil officers begin a lot of works, they are so worried and busy that they neglect coming troubles and responsibilities; and if the Department Public Works officers are hustled into the field and crowds of workpeople collected before things are half ready, the professional officers are disgusted and harassed, the works badly laid out, the people idle and undisciplined, till a halt is called and the work has to be closed to applicants, just as a pinch is beginning, till order can be restored.

(*b.*) During wet weather, or towards the end of a famine, or when for any cause the people of any tract are much depressed, the aid of small works might be called in.

But for the main system of relief in severe famine, I believe large works the only economical system, for not only do they give a good return in the work done, but they economise supervision and keep down the numbers seeking relief.

I do not say that small works cannot be managed so as to secure a return in work, but from what I have seen, they either necessitate piece-work management which keeps off the weakly,* or if the weakly are admitted, scarcely any work at all is done; and supervision on an extravagant scale is needed to get work, protect the weakly, and keep off the non-necessitous.

On a large work the officers and people settle down and large numbers can be admitted and controlled without trouble; small works are continually changing, officers and people always harassed where they are to go next, while no officer can feel sure that somewhere or other things are not going wrong.

Most officers who advocate small works, also advocate, I notice, no tests, except that of a given piece of work to be done for a given sum of money. But these officers who know that in a severe famine more than half the population will be willing to work outside their houses for a couple of annas a day, while thousands really in want shrink from piece-work, will not be satisfied unless they have only the minimum number on relief, and that number comprises those most in distress. Anyone responsible both for economy and the condition of the general population will find large works his strength; and here and there, for special reasons, he can use small ones too. Department Public Works officers who urge small works would probably not feel inclined to be made responsible for the physical health of the district; and civil officers who do so, would dislike a strict account office and strict inspection.

Briefly, then, I would, in ordinary scarcities, when numbers seeking relief are moderate, depend on small works, supplemented by large ones, if necessary; but with real famine in view, I would turn the whole strength of my civil establishment towards accurately forecasting the calamity, and of my Department Public Works officers to making ready for very large numbers, and I would allow no small works or half measures at first, but depend wholly on large works, and as distress deepened or weather necessitated I might bring small to my aid, if necessary.

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* Weakly people can only be admitted with a graduated scale of piece-work; to get this the people must be classed, and each class worked separately, to do this on numerous small works woud need an enormous establishment.

MADRAS.

Mr. Price.—I would, when distress appeared to me temporary, go on with ordinary works for which allotments had been made in Local Fund or Provincial Budgets, and I would not disturb the usual mode of supervising and directing these. I would at the same time, if this had not been (as it ought to be) done before, decide, with the chief officer of the Public Works Department, what larger works should, as famine measures, be taken up, and I would make preparations for setting about these if matters became worse. In the earlier stage of distress I would take on all applicants of the cooly class, making the sole test a proper day's work for the ordinary wages, and relentlessly cutting off a portion of these for short work. When it became clear, from increasing prices and demand for employment, the lapse of the cultivating season without sufficient rain, and the failure of crops on the ground, that a famine was inevitable, I would begin special works, and at that period I would prefer massing the people on a few localities at a reasonable distance from their homes, placing them under efficient Public Works Department supervision and exacting a full task. If matters became still worse, I should open smaller works nearer the homes of the people, but employ upon them only those who were weakly, leaving the larger works still occupied by the strong.

I am decidedly in favour of leaving all relief works, no matter of what kind, under the supervision of the Public Works Department. I have always been strongly opposed to placing anything but the most petty works, such as clearing silt out of drinking ponds and making small sanitary improvements around villages, under the superintendence of civil officers.

My reasons mainly are that the profession of an officer of the Public Works Department is the planning and superintendence of irrigational and other works; that the civil officers, as a rule, are totally ignorant of the way in which work should be done; that the officers of the Public Works Department are accustomed to measure up and account for work, which civil officers are not; and, lastly, that where a famine really occurs, a civil officer, even if he understood how to carry out any particular work, has so much of other matters to attend to, that he cannot give the necessary time to the supervision of work which, if it cannot be actually overlooked by a professional man, can be inspected and directed by him with more effect than by an amateur.

I know of no single argument in favour of placing relief works under the direction of civil officers. I speak from a comparison of the results in the Cuddapah District, in a portion of which the late Mr. Schoury undertook the entire care of some relief works and the supervision (charge remaining but nominally with the civil officers) of others. The out-turn and the quality of the work thus performed contrasted in a most remarkable way with those of work in other parts of the district which, owing to no fault of mine, was overlooked solely by civil officers. I consider that the chief district officer and the Public Works Department head of the district should, in consultation, settle all questions connected with undertaking special relief works. It should be the duty of the former to decide in what particular locality relief of this kind should be given, and to arrange through his subordinates for the supply of materials for camps, provisions, carriage, &c.; and when the work to be executed has been settled upon, to send to it the necessary coolies with rolls; and it should be the duty of the latter to be prepared with a sufficient list of works, to be able to state for what number of men, women, and children each one will provide employment, and for what period it will do so; and, finally, after discussing and settling with the collector which of these, as regards situation, nature of work, &c., is the most likely to afford efficient relief with the most chance of eventually the least loss to the State, to take it in hand, depending only upon the civil officers for his coolies and supplies. The responsibility that the needful steps as regards works are taken should, I think, be with the head of the district, the chief officer of the Public Works Department being responsible for the planning and execution of all works and the accounting for them.

Mr. J. G. Horsfall.—No special relief works need be opened. Ample employment could be found in ordinary works being carried on under the Public Works Department, Local Fund Boards, Municipalities, and Civil Officers. So far as possible the allotments of the year should be utilised and people readily admitted to the works upon piece or task-work. It would be sufficient in such a case if the superintending agency were strengthened, and regularity of payments ensured.

It is only when these works do not suffice to meet the crowds of applicants for works that special works should be opened, and these should at first be so arranged as to give employment to small bodies in the vicinity of their homes to which they would be able to revert at once upon the advent of a favourable monsoon. Abundant work of this kind can always be found in repairing or making village roads, repairing irrigation tanks, excavating or repairing drinking-water tanks and wells, reclamation of land covered with prickly pear, and the like. Of these only petty works requiring no engineering skill should be carried out under direct civil control, aided and supervised by the Public Works Department. The officers of the Department of Public Works are by education and training better qualified to superintend all works. They can estimate and see that the work done is adequate to the remuneration allowed. They have the advantage of being educated to carry out such works. It is only with regard to petty works such as clearing prickly pear, repairing village roads and village drinking-water tanks and wells, and such like that professional supervision is unnecessary and would prove too expensive. Such works as these can easily be carried out by the village officers, supervised by a Revenue inspector or clerk from the taluk cutcherry and checked by the Tahsildar and divisional officer, and occasionally by the district officer himself.

The selection of all works should rest with the collector and district engineer combined, except in the case of minor village works to be carried out under the superintendence of civil officers. These should be left solely to the discretion of the collector. When a sufficient number of works has been provided, the applicants for works should be passed by civil officers, leaving the execution of the works and their regulation as to task or piece-work entirely to the Public Works Department.

Works of public utility should invariably be selected, such as the improvement of water supply for irrigation or supply of drinking water; secondly, the improvement of communications, such as roads, railways, and canals. These works should be selected as far as possible near the centres of distress.

The responsibility of seeing that all needful steps are taken by all branches of the service should rest primarily upon the collector.

Mr. Sewell.—If the distress is expected to be merely temporary, applicants for relief should be first employed on the ordinary works which should be pushed on and extended as far as possible, I mean Local Fund roads, tank repairs, &c. Municipalities, as a rule, have so little money to spend on new works that they cannot do much in this way. Moreover, there are manifest objections to collecting large bodies of people in towns during seasons of distress. I do not think any test is required at this stage. Few will apply for work who do not really need it. If distress increases, it becomes necessary to open special works, and in the early stages I would rather give employment to small numbers near their homes, than collect them in masses. Such works, *e.g.*, tank repairs, formation of village roads, clearing village sites from prickly pear, can, I think, be best looked after by civil officers. Public Works supervision is so costly that it is not worth while to expend it on small and scattered works. As famine extends, I would advocate large works placed under professional management, such works being of course selected by the civil and Public Works officers in concert. Irrigation works, which will be remunerative either directly or indirectly are the best to take up. In this district, as mentioned above, we are so well off for roads that I would not advocate anything extensive in that line. The collector, of course, is responsible for the general state of the district, while the district engineer has the actual control of such works. If these two officers do their works properly and pull together, I do not think any difficulty can arise in this matter.

Major Baynes.—(*a.*) The locality of the ordinary works in progress should be widely made known; payments on them should be made at least three times a week so as to meet, as far as possible, the wants of the classes already mentioned (p. 18). A staff should be organized for the prosecution of special works, so as to afford employment immediately an abnormal pressure arose on ordinary works in progress; and, if local traders were keeping up fictitious prices by combination, I should import grain from places where it was more abundant and selling at a cheaper rate; and thus lower prices by selling to the coolies grain brought by myself; because to increase the rate of wage to meet unnecessarily high prices of food is simply to throw money into the hands of the traders at the public expense; and the water supply should be most carefully watched and maintained by cleaning out old or sinking new wells on petty contracts.

(*b.*) As long as the ordinary works in progress sufficed to meet the demand, I should leave them in *statu quo.*

(*c.*) I would apply no further test than the simple request for employment on task or piece-works; it may be assumed as a fact that the agricultural and urban population are only driven by necessity to abandon their usual avocations and their homes to seek employment on a Government work on which an outturn equivalent with the wage is demanded.

(*d.*) Immediately ordinary works in progress cannot meet the demand for employment, but all the working plans, specifications, and estimates connected with such works should be prepared and kept ready for this emergency, because, when the pressure of famine begins to act, the effect is awfully rapid; in a few days hundreds become thousands, and before labor can be supplied to those seeking it, they become physically incapable, and then the demoralisation of the laboring classes sets in with a force which cannot be subsequently stemmed; this could be prevented by having the plans and estimates of special works for every taluk prepared beforehand and kept in the collector's office to be taken up on an emergency, and, if the necessary augmentation of staff for supervision of them was made as soon as there was indication of an abnormal pressure on ordinary works, there would be no delay in opening them. The absence of this preparation was the chief cause of the disorganisation in my taluk.

(*e.*) I would divide the affected taluks into circles having a radius of ten miles, and in the centre of each I would have a special work of Class I, so as to avoid the collection of coolies in unwieldy masses; the results of so doing have been shown to be imperfect supervision, delay in measurements, and consequent irregularity in payment of wages; sickness resultant on insufficient or over-crowded accommodation and scanty supply of water; death caused by want of medical treatment; epidemic disease generated by imperfect sanitation; for, however good the sanitary scheme may be, the attempt to obtain a voluntary submission to its rules from a mass of undisciplined people whose habits are filthy will prove futile, and a compulsory observance of them will necessitate so large a cost on the sanitary staff that it would be very disproportionate from the result obtained and from the sum paid as wages to the coolies for whom it has been formed. Moreover, this question involves that of the distance test which is discussed in Chapter III.

(*f.*) At the same time, I would strongly oppose the opening of numerous petty works under Civil Agency —such as were styled "village site improvements, eradication of prickly pear;"—at all events, till all other special works were exhausted; because they can neither be efficiently supervised on account of their number, nor can they permanently supply the amount of relief required during a season of distress; moreover, they utterly unfit the ryot for employment on special works of a legitimate character, for, when he has been morally demoralised and physically weakened by being paid a bare subsistence for the eradication of prickly pear at his doorway or for digging a hole in his village pond, it is impossible to get him away from his village to do fair work on increased pay.

I would divide special works into two classes. The first would include road construction and all irrigation works; in every circle I would have one work of this class which I would style Class I. The second would comprise repair of existing roads, collection and breakage of metal on them and on roads under Class I, which I should style Class II, and I would not require labourers to come to works of this class from a distance greater than three miles.

To Class I, I should attach—

Men and married women up to forty-five years.
Unmarried women from twenty to forty-five years.
Lads and girls from twelve to fifteen years.

Marriageable girls between fifteen and twenty and children over ten years would be attached to this class if accompanied by their parents or near relatives; and, if marriageable girls though unprotected, desired admission to it, I should not refuse them. I should not separate a husband from a sick wife or *vice versâ*, nor a parent from a sick child; in such cases I should temporarily employ the able-bodied relative on Class II.

To Class II, I should relegate adults between forty-five and fifty-five years, nursing mothers, and women in advanced stages of pregnancy, marriageable girls between fifteen and twenty, and children between ten and twelve years if they had not an adult relative in Class I whom they desired to accompany.

The persons attached to these classes should be able to do seven-five per cent. of the ordinary out-turn of an able-bodied laborer of each class. I am strongly opposed to the employment of children under ten years of age, and would as strongly advocate the gratuitous supply of cooked food to all below ten years who are eligible for relief, either in their village kitchen or in the camp attached to the work on which their parents were employed; the former plan is the best for many reasons; the cost of so doing very slightly exceeds that of employing them, but the results of the two systems are very different. Children of this tender age, if worked all day for a continuance, become prematurely old and do not thrive on any amount of food; they want less work and more play; during the famine, children over *seven* years were *compelled* to earn their bread by *working* from 7 a.m. to 5 p.m.; very few children of this age could stand this exertion even for a few days, and I did not carry out this order in consequence of the injurious effect it would have had on the "rising generation."

(*g.*) Under civil supervision, as far as classification of laborers, issue of pay, sanitary and medical arrangements, supply of food, and the general welfare of the labourers and their children are concerned. The interference of the Public Works Department should be confined to matters purely professional and to measurements of work done (see paragraph XVII *b*, Chapter III., section I).

II. Qn. 6.

MADRAS.

(*h.*) In stating my reasons for placing the unprofessional branch of the administration of relief works under the Civil Agency, I must premise that my remarks apply only to my own taluk, and are the result of my limited experience; and that I only desire to comment on a system as it presented itself to me, not on individual officers of the Public Works Department. It is true that this department did not take any active part in relief operations in my taluk till September 1877, but in March 1878, it was unable to make regular payments, and coolies were starving on some works because wages were in arrears as much as three weeks.

Generally speaking, I consider that the welfare of the relief coolies and their families was held a secondary object to the attainment of professional interests and the maintenance of departmental routine; nor, if this be the fact, is it one to create surprise, because the European officers of the Public Works Department are never brought into *direct* contact with the coolies employed on their works, they deal with contractors through their overseer; and make only large payments on carefully-checked completion certificates; they are not as a body conversant with the language, feelings, or capabilities of the coolies, and the professional habits and training acquired by them under a systematic discipline cannot be broken through without a total disorganisation of the department; and my experience goes to show that the department is not *naturally* constituted to act as a relief agency, that it is not sufficiently *elastic* to become so with sufficient rapidity, and that its officers, high and low alike, never realised the fact that the *primary* object of a relief work is to *save life*, and not to sacrifice it to the maintenance of departmental rules and systems of accounts.

(*i.*) I would leave the selection and time of commencement of special works, previously sanctioned for an emergency, to be determined by the collector of the district, who should intimate his wishes on these points to the district engineer in sufficient anticipation of their being actually required, to allow of that officer making his departmental arrangements for supervision of professional details and for securing regular measurement of the tasks performed by the gangs.

(*k.*) By the district engineer subject to the condition of distance mentioned in sections *e*, *f*, of this paragraph, and on a request from the collector, he should be empowered to extend those or open others in anticipation of sanction, supposing the necessity arose for providing more labor than was originally estimated as requisite.

(*l.*) On the collector and the district engineer; the former would be responsible for all relief details, the latter simply for the correct prosecution of the work and submission of measurements. Payment of wages on pay sheets passed by the Public Works Department should be made by the Civil Agency.

MYSORE.

MYSORE.

Colonel Sankey.—To the inquiry, under what tests the applicants should be admitted, I can only reply by opening up the whole subject of tests, which at this initiatory stage seems to me as applicable as at any other. After what I have already written, I can only submit my opinion that all the test required is, that persons looking for State aid should be required to work at piece-work rates, suited to the ruling price of grain, and to their individual capacities; and that all artificial tests are not only needless, but likely in most cases to be mischievous, causing both loss to the State, and needless suffering, if not death, to the distressed individuals.

With the utmost respect for the humane motives which have unquestionably underlain the system adopted, for instance, in dealing with the Mysore famine since the introduction of the new *régime* in September 1877, it seems to me to have partaken far too largely of an artificial character. Among such arrangements I would include the following:—

(1.) That the applicant should travel ten miles from his home.

(2.) That he or she should reside* in a relief camp and submit to its discipline.

(3.) That no "well-to-do" labourer should be provided with any work by Government (see Section III. page 9, of *printed Collection*).

(4.) That no labourer should be encouraged, by any prospect of additional pay, to do more than his task.

(5.) That only a bare subsistence should be provided for those seeking relief.

(6.) That the State, instead of the parent, should support non-working members of families and infants.

(7.) That nominal rolls should be made out daily on relief works, showing name, caste, and residence of each applicant.

(8.) That such rolls should be called over daily before work commences (see Famine Code).

(9.) That pay should be disbursed, and tasks set-out and measured up, daily, &c.

To these principles, as laid down stringently in the Mysore Famine Code or in departmental orders, I would add the following lessons which Sir Richard Temple has laid down as the result of his experience, but which nevertheless appear to me equally artificial and unsuitable in their character, *viz.*—

"To prohibit absolutely, in the beginning of distress, the opening of petty works under Civil Officers, of non-professional establishments, among the villages close to the homes of the people.

"To refuse relief to strong, able-bodied persons of both sexes, in any form, who have employment on large public works.

"To allow petty village-works to be opened only where severe and widespread distress has declared itself at a comparatively advanced stage in any district or part of a district; and even then to reject all, save those who cannot reasonably be expected to proceed to the large public works, &c.

"To insist upon a systematic inspection by responsible Civil Officers of all relief gangs, person by person, and from time to time, in order to see whether they are all in need of or deserving of State assistance, and to note whether their physical condition improves or deteriorates.

"To reject every applicant for, or recipient of, relief, whether on a public work or on other works, who can be shown to be able to support himself for a time without State assistance.

"To keep wages on relief works at the lowest rate compatible with the health of the labourers; this being necessary not only in the interests of economy, but also to prevent demoralisation of the people."

In reference to these, I shall only add some brief observations to what I have already advanced on the subject of tasks, distance test, and bare subsistence allowance.

As regards the first, I find, in a memorandum by Mr. Elliott, of 12th February 1878, *that he* saw fit, in dealing with the work of Sergeant *Heinig's* (Mullapa Chetti) tank, to substitute piece-work for tasks; observing—

"Accordingly, Mr. Target and I came to this conclusion, *that only two rates should exist*—piece-work and the old B scale (*i.e.*, two annas for men and one and *a half anna for women*); *that every woman should have the chance of getting piece-work rates*; and *that no one should be put in B pay unless* he or she, being able-bodied and fit to be put in the A class, refuse piece-work."

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* This may be very essential, however, in dealing with professional beggars and waifs and strays generally.

Again, in regard to the Chick-Hoscotta series, Mr. Elliott observes—

"I think that every effort should be made to get the people on to piece-work."

The distance (that of ten miles) was also apparently discarded after sufficient trial; but the same Famine Proceedings from which I have quoted above show that the Commissioner was not prepared to abandon this entirely ; and such being the case, I will now quote from his memorandum on the Kolar district, dated 10th February 1878, having reference to the point :—

" . . . . So much for the villages ; in the towns there is not so much employment to be had . . . . I am satisfied that the time has come when we ought to open a relief work near each of the large towns.

. . . . "If possible, it should not be so far from the town as to entail the necessity for hutting the labourers, nor so near as to be quite at their doors ; the best position would be two or three miles off, so as to force them to shew their need of relief *by taking a good long walk in addition to their daily task*."

Walking being only one of many ways of expending vital force, I must confess myself entirely at a loss to understand why the three hours thus proposed to be employed in going to and in returning from work should not be turned to the profit of Government by having the work as close to the doors of the people as might be conveniently feasible. As it stands, the proposal seems to me to insure deliberate waste for no conceivable object, as it is clear that a corresponding addition to the task near home would equally test the sincerity of the applicants.

In reference to the "bare subsistence" of which so much has been said and written, I confess it is to my mind quite as untenable as the other tests.

The *first* objection to it is, that, being insufficient for the support of a working labourer, Government cannot get an adequate return for the wage given, it is therefore uneconomical ; the *second*, that disbursed as the wage or its equivalent may be, for the use solely of the individual recipient, it interferes with the universal law of providing for offspring, and with the almost equally strong native custom of providing for poor relations, caste brethen, and hangers-on ; and the *third*, that its inevitable tendency is to underfeed the children, and thus undermine the physique of the rising generation.

The latest ruling on the subject of this "bare, subsistence" allowance, as applied in the North-Western Provinces, appears for an adult to provide as follows :—

10	chittacks of	wheat-flour,
2	„	dâl,
¼	„	salt,
1½	seers	firewood,

and is, therefore, an improvement on the 1 lb. meal previously prescribed by Government.

Writing in 1874, Sir Richard Temple observed that the rate, as proposed by himself—

"¾ of a seer, or about 1½ lbs., per head for men, women, and children, at which grain should be provided, was assumed after due consideration and discussion. The lowest diet provided in Bengal jails for non-labouring persons is equal about 1 seer, or 2 lbs. The ordinary diet of a labouring adult in Bengal is taken, after statistical inquiry, to be 1 seer of rice, ¼ seer of fish, pulse, pep or other condiments."

The ordinary daily meal for a cultivating ryot in Mysore falls little short of two seers (over 4 lbs.) of *ragi*, which is understood to be even a more sustaining grain than rice ; and although Sir Richard Temple and other officers supported, in dealing with Madras and Mysore, the sufficiency of a meal not more than one-quarter of this, I can safely say that, in the opinion of all Medical and Civil Officers with whom I have come in contact, and who had the best means of forming an opinion on this subject in Mysore, this average quantity (1 lb. of grain) was held to be wholly inadequate for labourers in work ; and that the inevitable tendency of such diminished feeding would be to lower the assimilative powers till the patient became after a certain time incapable of digestion. The feeding would, in fact, be not only ineffective, but dangerous if persisted in for any length of time.*

But the worst feature of the "bare subsistence" allowance is its baneful effect on the rising generation. If famine be only of short duration, under-feeding the adult population may possibly not inflict on them any very lasting injury ; but, surely, no one will contend that such will not interfere with the proper development of children ; and if continued beyond a certain point, that it will not inflict injuries which cannot be effaced for several generations, if even then.

The "bare subsistence" diet given to children must, I submit, have this inevitable effect, even when a responsible famine official is able to see with his own eyes that each child actually swallows what is thus doled out ; but if he is unable to give this guarantee, what may it be supposed is the practical result ? It is this : the child gets little or nothing to eat. Hunger overcomes every instinct except that of self-preservation; and in Mysore I have seen the most glaring examples of parents, when thus pressed, having deprived their own offspring of food. I have seen hundreds of women carrying on their hips living skeletons of children which they had brought to this stage, while satisfying their own wants. On this point I would appeal to Mr. L. Ricketts, the intelligent Deputy Commissioner of the Bangalore District. I feel assured, from all I have seen and heard on this subject, that I shall be supported in this opinion by the great majority of the Civil, Public Works, and Medical Officers who have served from the first through the Mysore famine.†

A writer in a well-known newspaper lately defended the "bare subsistence" wage, observing that—

"By raising the ordinary wages, and paying in the ordinary way when prices are at famine rates, the State runs the risk of not providing for women and children ; while to bachelors it would be paying much more than is necessary."

Strange infatuation ! It is alone by piece-work, and the facility the system affords for adjusting rates to any phase of the market, that women, children, and non-working members of families can be properly sustained ; while the contrary, as I have shown, is the inevitable result of the task system, combined with the "bare subsistence" wage. And as to the argument based on *bachelors* getting more than necessary, I need hardly say such ornaments of native society are practically unknown, in Southern India at least. If a man have no wife he is certain to have a substantial equivalent, and in any case hangers-on, for whom he must provide. In fact, while it is next to impossible, by any rigid system for distributing by measure through any State Establishment, to dole out the precise amount of sustenance required by every individual during famine, and insure economy in the operation, both ends are met in the most complete manner by the natural distribution which takes place through the system of payment by results. *The able-bodied labourer is, and must always*

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* In the *Army Medical Report* for 1876 I find the following, page 223: "Sir Richard Temple assumed that it was possible to feed the people on a smaller amount than was given in the Bengal Famine, and accordingly only 1 lb. of grain was given instead of 1½ lbs., besides half an anna for the purchase of condiments. This amount was barely sufficient to maintain life in a state of rest, but was utterly inadequate for even a moderate amount of labour. The result was that, task-work being demanded of those people, they perished by thousands."

† Evidence of the same character may be had from Sir Charles Trevelyan's article in the *Quarterly Review* on the "Irish Crisis," in which it is observed: "The relief work did not always furnish a subsistence even for those who were employed on them. The wages, paid regularly in money, were higher than any which had ever been given for agricultural labour in Ireland ; but, at the existing prices of food, they were insufficient for the support of a family, melancholy proof of which was afforded by daily instances of starvation in connection with the relief-works."

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remain, during famine, as in ordinary times, the natural distributor and economiser of wages. In the endeavour to perform artificially the same operation, hosts of minor, and therefore of untrustworthy, agents have to be employed; and no matter what the vigilance exercised by the superior officers, misappropriation must occur, leaving the objects in view unfulfilled. More money will, as a matter of necessity, be spent by the State, and less food reach the stomachs of the people. Without the least desire to dogmatise, I confess I cannot but feel that the "bare subsistence" wage is uneconomical, useless, and most cruel in its effects, on the rising generation especially.

Mysore, and probably the whole of the southern portion of the Peninsula, under the tank system, furnished an infinity of small works of the most useful character, the earth-work of which is capable of being dealt with by village *potails* under even non-professional supervision. These, taken with the enormous amount of small sanitary work calling for attention, *viz.*, rectification of bad drainage, filling-in unwholesome pits, levelling old mud forts and filling-in their ditches, clearing jungle, digging wells for the improvement of water supply, planting belts of trees to ward off unwholesome winds, &c.—that, taken in conjunction with such a three or four years' programme of Public Works as I propose, the field of selection, both of large and small works, would be amply wide to meet even the worst contingency of famine. When such, however, occurs, the actual selection must, I think, be left to the Local Government or Administration, unhampered by rules which may or may not be applicable to the particular circumstances of the locality, or of the form in which distress manifests itself.

As regards engineering works, particularly those of an ambitious character, I need say nothing: they will probably more than take care of themselves the moment the policy of Government is promulgated, especially if the present surplus Public Works establishment be utilised for the purpose.

To the concluding question, on whom should the responsibility rest in the district for seeing that all needful steps are taken by the several branches of the public service concerned, I think that the same reply may be given, *viz.*, on the Head of the Local Government, once the Government of India has authoritatively recognised in any province the necessity for exceptional measures.

And at this point I trust it may not be deemed out of place if I venture to offer some observations regarding the employment of special agency in the conduct of a famine campaign, under the direction of an officer armed with unusual powers, such as a Famine Commissioner, to whose advice the head of the Local Government is bound to attend, and who, so far as concerns all famine matters, is for the time being practically a dictator.[*]

It does not follow, because some such appointment for regulating matters in an entire province is found necessary, that therefore unity of action can only be secured by making a corresponding arrangement for each division or district, or *vice versâ;* still it appears to me that there are strong reasons for considering that the sudden change from ordinary routine thus involved would be as generally inadvisable as to carry out a change of commands and tactics with an army when standing in face of the enemy.

To decide on the success of the measure from the particular case of Bombay in the conduct of the late famine would, I submit, be fallacious. Unquestioned advantages of a certain kind resulted from the sudden administrative change there made at the commencement of the distress; but these were apparently for the most part due to certain personal elements most happily combining at the proper moment for the public good; also to the following facts:—(1) the famine neither in intensity nor duration was comparable to that[*] experienced in Mysore, or in many parts of Madras; (2) only a comparatively small portion[†] of the lesser ryots and subordinate cultivators were apparently affected, and relief was required chiefly for classes who could conveniently be gathered in large camps; and (3), whereas the civil officers soon ran out of small works, the Public Works Department had large schemes on which the Local Government was most anxious to have favourable opportunity for commencing.

The financial value of the works commenced in contravention of the previously expressed orders of the Government of India (see page 6 of my *printed collection*) remains to be ascertained, and their cost, past and future, gauged, before a safe conclusion can be arrived at regarding the measure of success attained in Bombay.

But his Excellency the Viceroy has, in paragraph 24 of his minute No. 131 of the 12th August 1877, pointed to a source of weakness in such special appointments which cannot be overlooked. He observes in reference to the appointments of Major-General Kennedy—

> "Of course, however, this arrangement might have been as injurious as it proved beneficial, had the officer selected, on whom the results of it depended, been deficient in experience, judgment, or energy."

It is sufficient matter of notoriety that ever since the formation of the Department the relations of the Public Works with the Civil Department have been more or less strained (to a greater decree, probably, in Southern than in Northern India); and if the course followed in Bombay were adopted as the rule for the future, it is to be feared a legacy of ill-feeling would be engendered which could not fail to be very detrimental to the public service in future.

If the Head of the Local Government have not the requisite force of character to counteract a tendency towards virtual supersession, in such a case, by his own Chief Engineer, the position would clearly be highly objectionable; but, on the other hand, if both be men of strong will, and imbued with different ideas regarding the plan of action for meeting the famine, a fatal weakness would be the result of their conflict of opinion.

Again, the appointment of a Civil Officer who, as Famine Commissioner, would stand between the Head of the Local Government and the Chief Engineer, would, I venture to consider, be still more objectionable, and particularly so if he be a stranger to the province.

In this latter case, with the urgent demands of famine pressing on his every moment's attention, such an officer could have no time to master the local facts sufficiently for forming safe conclusions; and as, from the very circumstance of his special selection for the post, he would probably be a man of distinguished ability and strong will, he would for this reason hold to, and defend with tenacity, the plan of campaign which, whether really well or ill devised, commended itself to his judgment.

A plan thus, of necessity, hastily *improvised* could not reasonably be expected to accommodate itself to all the complicated circumstances and requirements of a province suffering under famine, when, as

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[*] As this is apparently a strong term, I beg, in order to avoid misapprehension, to quote the terms under which, for instance, the Famine Commission of Mysore acted, and from which I have drawn this conclusion. In Government of India letter to Chief Commissioner of Mysore, No. 821 of 8th September 1877, it is observed that "he should have authority, when "travelling in the interior, to give instructions in your (the "Chief Commissioner's) name to the local officers;" and in circulating this, the Chief Commissioner directed (on 16th September) that "all written, or, in minor matters of detail, "verbal, instructions, which may be given by that officer (the "Famine Commissioner) direct to the Deputy Commissioners "should be promptly carried out."

[*] In only two places, Belgaum and Dharwar, was grain as high as 9 lbs. per rupee in August; and only one place, Kaladgi, in September 1877, in which latter month the famine may be said to have ceased. For corresponding prices in Mysore, see footnote to my *printed Collection*, page 3.

[†] See paragraph 17 of Sir R. Temple's Famine Minute of 24th December 1877.

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we know, the whole fabric of society verges towards dissolution, and would almost certainly be in many respects quite mistaken. The very ability and character of the selected officer would necessarily aggravate the evil, and crotchets of the most mischievous kind might easily take the place of a sound and intelligent treatment of the disease.

It thus appears to me that, in the management of famines for the future, the aim should be to pass into the new conditions required with the least possible dislocation of the existing machinery of Government; by, in fact, a simple process of expansion.

Major Scott Moncrieff.—The first measure to be adopted as long as it is doubtful whether famine is approaching or not is for the district officer to obtain a relaxation of budget rules both as regards Imperial and local works. The first effort must be to give full employment to the able-bodied. Repairs to roads, canals, &c. should be pressed on, and if these are not enough, and there are no sanctioned new works in progress in the district, additional ones should be started, which it is to be presumed will have been prepared against this contingency. There should be no test save willingness to work, no special relief arrangements. At this stage it is enough to pay rigorously according to work done, but there ought to be plenty of work, and no man willing to do his day's task should be turned off because he does not look in want. A few large works are unquestionably better for supervision than many small ones, but if the people will not resort to them, works must be found to which they will resort. At this stage if the Public Works Department can take in hand the supervision of the works it is better. Their organization is in every way superior to that at the command of the civil officers, and it is not till later than this that mischief is likely to occur from the Public Works officer insisting on a standard or rate of work incompatible with relief to the starving. The executive engineer and the officer in charge of the district should be in the closest friendly communication. If they will not work together, one or the other should go. The Public Works officer must select those works on which he can employ the greatest amount of unskilled labour with the least expenditure of supervision and of materials, and his works must be as near as can be to the centre of distress. Earth work is the best form. The collector or deputy commissioner must be responsible for seeing that in his district all is done which ought to be done.

Mr. Ricketts.—Even if I believed the distress to be but temporary, I would not advocate employment of applicants for work on ordinary works in progress, as there would be existing labourers on such works, and many of whom ordinarily maintain themselves and families by such works. Besides the assumption that it was only temporary distress would in part be based on existing facts, one of which would be the existence of such works and their power to provide for a certain number of then working people. I would therefore in the state of facts under consideration consider it desirable to open special works, the test being comparative poverty and task work, the works should be spread over many places so as to employ smaller bodies and in the vicinity of their homes; and such works should be under civil supervision, except in localities where the services of Public Works Department officers are available. Large numbers of work people on one work are standing menaces in a sanitary point of view and invite cholera visitation which is spread far and wide as the large numbers disperse to their various homes. Large numbers are more difficult of control and payment. A large work with the cessation of temporary distress might be left unfinished, which would scarcely be the case with a smaller one. The little work is often much needed, and working near their homes preserves domesticity and morality. In the civil branch there are more subordinates than in the Public Works Department, and they know the people better. Otherwise I should say the Public Works Department was the best agency. The district officer and his assistants must personally work and confer with the executive engineer and his assistants. The work might be selected by the Public Works Department in previous concert with the district officer, who, as a rule, could readily name numerous projects, all useful, and many of them both necessary and remunerative; and in case of difference of opinion the commissioner and superintending engineer should settle the point. I think the responsibility for seeing that all needful steps are taken by all branches of the public service concerned should rest on the district officer.

Colonel Johnson.—When distress has declared itself, and it has been decided that relief is necessary, works in progress in the distressed locality should be thrown open to all applicants, whether the works are under provincial or local officers, the Public Works Department or municipalities. The only test desirable is that the people employed shall receive payment only for the amount of work they turn out. The rates may, if necessary, be raised so as to permit of the people earning sufficient to support themselves under the increased prices of food; and if this be done carefully there is no probability of anyone resorting to the works who is not obliged to do so for self-support. It is above all things necessary to induce the people to flock to the works at the commencement of famine, so as to keep up their strength and condition, and not only theirs but that of their families also. The piece-work test allows of this being done, and of entire families being employed, excites a spirit of emulation amongst the people, preserves their independence, insures Government getting full value for its expenditure, and is less trouble to all parties than any other system. Anything in the shape of bare subsistence rates, except for confirmed malingerers (who should never be allowed near able-bodied works), cannot be too strongly deprecated.

It is desirable to open special works, first, where there are no works in progress within a convenient distance of the distressed locality; 2nd, when some of the people are unable to do sufficient work at ordinary rates to earn enough to support themselves.

It is inadvisable that incapables should be worked with able-bodied labourers, and they are best employed on distinct works, or if the works are large enough, at a distance from other labourers.

As regards the distance the works should be from the distressed locality, the nearer they are the better, but if there are suitable works within 20 miles, it is in my opinion quite unnecessary to open fresh works for able-bodied labourers. In case of rain falling they can get back to their fields easily from such a distance in a few hours. In case of there being no likelihood of their being suddenly required at their villages, they might be expected to go 40 or 50 miles for work.

The numbers that may be employed together should I think be mainly regulated by the works available, and will be commented on when answering question regarding large and small works.

All works for able-bodied labourers should be under Public Works officers, if available. Works for incapables may also be placed under Public Works officers, if available; but this is not likely to be the case, and a Public Works officer is thrown away in looking after people that can do no work, when there is abundance of work to be supervised elsewhere. Incapables and people who will not work require special provision:—medical skill to attend to the sick, magisterial powers to deal with malingerers, skulkers, &c.,—there is no object in saddling a Public Works officer with these duties. They may be better performed by revenue, judicial, medical, or other officers specially appointed for the purpose, the more so, as in case of general distress a number of extra officers having to be appointed, they may be specially selected for such duties. Neither is any useful object gained by working incapables with able-bodied. I have no doubt whatever that lakhs upon lakhs of rupees have been thrown

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away during the late famine, simply from neglect of the apparently self-evident necessity of keeping these classes distinct.

There does not seem to be any necessity for further provision to place Public Works officers in communication with district officers than already exist.

In the selection of works for relief, Public Works officers should be guided: 1st, by the utility of the work. 2nd. By its situation with reference to the distressed locality. 3rd. By the suitability of the bulk of the work to be done to the people who are to carry it out. 4th. By the sanitary condition of the site of the work and means of obtaining supplies, water, &c. 5th. By the state of health of the people. If cholera or other similar epidemics are prevalent it will be inadvisable to collect people in large gangs, and small detached works would probably be more suitable.

The responsibility for seeing that all needful steps are taken in a district should of course rest on the district revenue officer. It appears to me that during a famine, much more than at any other time, it is advisable that the management of a district should be left in the hands of the officers that know most about it. The number of officers may be increased to any extent desirable, and inefficient men replaced by efficient; but the normal machinery of Government should on no account be disturbed.

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Question 7.—Poorhouse Relief without Labour Test.

Under what circumstances should poorhouses be opened to give relief without a labour test? Are there any other practical ways of affording relief at this stage, except through private charity?

Punjab.—7 officers have answered. Opinions not unanimous, but chiefly that poorhouses must be opened when required for beggars and infirm poor without test if applicants unable to work.

North-Western Provinces.—28 officers have answered. The majority of opinions corresponds with those of the Bombay officers.

Bengal.—16 officers answered. Poorhouses are necessary when beggars and wanderers increase, and no labour test should be applied, as the inmates should be unable to work. Cooked food to be given.

Bombay.—13 officers have answered the question. The majority think that when there are numerous destitute persons who cannot work, poorhouses must be opened for relief without labour test. No other plan is suggested.

Madras.—26 European and 4 Native gentlemen have furnished replies to this question.

The general opinion is that it is unnecessary to open poorhouses and camps for gratuitous relief at the earlier stage of famine, especially if at the commencement employment on sufficient wages is provided for the able-bodied, which will not only prevent them deteriorating in physique and coming on gratuitous relief themselves, but will enable them to maintain as usual those members of their family who are incapable of working, and who would otherwise have to be supported by the State. The stage succeeding that which calls for special relief works is considered to be the time when poorhouses should be established for the relief of those who are unfit to work, and from whom, therefore, it would be absurd to demand a labour test. This need not prevent the inmates being employed on light work in and about the camp, when they are able to do it. To supplement this form of relief, house-to-house visitation, and the distribution at their homes of money and grain doles to persons whose social customs or physical infirmities preclude them resorting to relief camps is suggested. Another suggestion is that village kitchens are more effectual as a means of relief than the congregation of large bodies of paupers in poorhouses.

Punjab.

PUNJAB.

Muhammad Hayat Khan.—Poorhouses should be opened only when the distress assumes a gloomier aspect, and the people are driven from home by hunger. Such persons should be admitted into them as cannot, on account of old age or infirmity, work. They should not only be provided with food, but should also be housed and clothed. These poorhouses may be supported from three sources: (1) Imperial funds; (2) subscriptions raised from private individuals; (3) district and municipal funds.

Colonel Parsons.—(*a.*) Gratuitous relief is admissible when the proportion of 'incapables has increased to an extent that renders it unreasonable and inexpedient that they should continue to be a burden on the miscellaneous charity of the community. (*b.*) In aid of private charity a grant from the district funds disbursed under district supervision is a practical and appropriate mode of affording relief.

Mr. Coldstream.—The experience of distress I have had convinces me that gratuitous relief is *desirable* as soon as works for the relief of distress are necessary. But to the introduction of gratuitous relief by a special agency and at new centres *at this early stage,* there are insuperable objections. It is disproportionately expensive, for it requires careful and complete organization and superintendence.*

But much good may be done, *i.e.*, lives may be saved, by putting small sums of money at the disposal of selected *Zaildárs* and *Lambardárs*, and holding them responsible that deaths from sheer want are prevented in their villages and circles. Now that a famine fund is at the disposal of Government, I recommend that this plan be adopted in cases where the necessity for relief at home has not yet become quite clear.

Mr. Roberts.—A labour test is desirable in all cases of poorhouse relief, and is essential except for people absolutely incapable of any kind of light labour; but most of the recipients of relief are hardly able to crawl to and from the distributing house, much less to work. At first, however, many professional beggars

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* This illustrates *the* great danger of the British rule. It is better to let children fall sometimes when trying to walk than always to hold their hand. It is better to allow a few accidents arising from children running about than always to send out a nurse or tutor with them to keep them out of mischief.

See the remarks on the effect of Government by a bureau in *Mill* on "Liberty." Would that all Indian administrators took heed to his warning.—A.B.

Punjab.

obtained admittance, able to work but unwilling, and the introduction of a rule requiring them to grind corn for their own use, reduced the number at the Gurgaon poorhouse in one day from 120 to 40.

Mr. Nicholl.—Poorhouses should be opened to give relief to the blind, the infirm, and those people who are, from whatever cause, unable to work.

Poorhouses and private charity for these people are sufficient at this stage.

Mr. Benton.—I think that during the earliest stages of distress poorhouses are not required. I have never seen the poor and infirm abandoned by their richer relations; and although mendicants may perhaps not obtain alms so readily from those who formerly supported them, what they receive may perhaps be supplemented by the charity of others, who may open their hands in consequence of severity of the season. Moreover, if they should be on shorter rations for a time, no damage would probably be done, and their case is not likely to continue long concealed from the authorities, whatever may become of others.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. W. C. Plowden.—If I was proceeding to attempt to organise private charity in a time of great temporary distress in a district with which I was familiar, I should proceed somewhat in the following manner:—

I should first obtain, from the best sources available to me, a list of the persons who were in the habit of distributing either food or alms, and should endeavour to ascertain what were the sums of money expended annually by such charitably-minded persons. Having done so, I should call a meeting of all the influential men in the town or locality to which the operations of relief were to be confined. I should be careful to secure the presence of the persons on the list I had already obtained, and I should endeavour in previous personal communication with them to induce them to double their ordinary subscriptions or to go even higher. What one wants in such a case is to work upon those who give only as a matter of ostentation; the really charitable will give any way, and if the ostentatious find their less wealthy neighbours are giving freely, they also will put their hands deeper into their pockets.

I will suppose, then, that the public meeting has resulted in a fair contribution from the people; the next thing is to organise its distribution, and to arrange by whom the distribution is to be effected. As far as possible, I should leave it to the more influential men of the locality to supervise the distribution. Those who should receive charity should be divided into two classes—those who might be relieved in a poorhouse and those who should be relieved at their own houses.

Some slight task should be assigned to each person relieved, whether relieved at their houses or in the poorhouse. The latter should not be allowed to leave the poorhouse.

Mr. Sells.—Poorhouses would, in my opinion, be invariably necessary in any time of severe distress independently of any labour test. There are always a number of blind, halt, lame, and sickly people, who could not possibly turn out any work worthy of the name, and the requiring of work from whom would simply be equivalent to utter waste of material. Relief to such must, I am of opinion, be positively gratuitous.

Mr. Tracy.—A poorhouse or hospital should be opened at an early stage of the distress for the sickly and infirm, for lepers, cripples, and travellers exhausted by privation. I do not know of any other way in which relief can be given at this stage.

Mr. Mellor.—When works are opened in several places in the district, I think the plan of having a nursery attached to each work, and allowing those who come for relief and are physically incapable of work to be fed thereat without exacting any task is a good one. These persons will for the most part have relatives at work and will leave with their relatives, and go home when the temporary distress is over. Having large central poorhouses and making all the incapables congregate there separates them too much from their relations, on whom they have hitherto depended for support. Natives of this country as a rule are willing to support their old and infirm relations if they can, and it is a pity to do anything which would tend to weaken this feeling.

Mr. Kennedy.—Poorhouses are entered by the lowest and most destitute of the population. They are requisite at an early stage if public relief works are not opened. Last year the district poorhouse was opened in October simultaneously with the relief works under the district engineer. The people were by this time unable either physically or mentally to do the work which the district engineer demanded, and were sufficiently infirm to be admitted into the poorhouse. The consequence was that the poorhouse, notwithstanding the prejudices of the poorest class, continued to be much more crowded than the relief works. This year relief works were provided when the poor had exhausted their gleanings from the rabi harvest. They have consequently been much better attended than last year, while it has been sufficient for all needs to enlarge the municipal poorhouse and to establish a pauper infirmary. We have therefore had an opportunity of observing the effect of both policies, and I should strongly recommend the postponement of poorhouse relief until famine has considerably advanced. It is only after a time that the absolutely helpless are thrown off by private charity, or that persons become physically incapable of earning their own livelihood. Relief works on the other hand should be opened at an early stage in order to evoke the self-reliance and moral energy of the people. I am not aware of any other means of Government relief applicable at this stage. I am of opinion that a *mont-de-piété* would be extremely useful to the poor in the famine year. An application was made last year to Government on this subject, but on further study of the question I came to the conclusion that these *monts-des-piété* were unnecessary in ordinary years, and could not be properly managed by the Collector and his staff. Undoubtedly any scheme for enabling the poor to get a reasonable price for their valuables in a year of famine would be a great blessing if practicable.

Mr. H. H. Webster.—I do not think that there are any other physical ways of affording relief but by the establishment of poorhouses. A house-to-house system of relief, which is the only alternative I can see, is in my opinion calculated to demoralise and pauperise the people to a lamentable extent; and besides, it is open to the objection that it affords a direct encouragement to peculation on the part of the distributors of relief, over whose actions in the way of disbursements no check is possible.

Major Liston.—There is little fear of people fit for work in this district resorting to the poorhouses. As long as they can work they will. To prove this, I quote Lieutenant Bagge, R.E., who in the famine of 1868-69 wrote,—"Many of them to avoid the "imaginary disgrace of taking food from the

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North-Western Provinces and Oudh.

"charitable kitchen, would rather toddle to the tank, "then work for the day and toddle off with their "pay in the evening; and I saw more than one case "where we had to send weakly and sickly people "from the works to the poorhouse."

Mr. Whalley.—If the first measures described in the answer to the last question are ineffectual in preventing the village destitutes from flocking into the towns in search of charity; or if distress manifests itself at once among the poorer part of the urban population as under exceptional circumstances may be the case; and from either cause destitute vagabonds infest the streets and bazaars for the most part unfit for labour; then it becomes necessary to open poorhouses.

Mr. Cornwall.—Poorhouses may be opened to give relief without labour to such persons as through sickness, old age, extreme youth, or debility are unable to work. Such of the persons as come to the poorhouse in a feeble state may, after being properly cared for, be strong enough to be drafted to relief works; and as an intermediate stage, they might be given light work to do at the poorhouse. Except through State aid or private charity, there seems to be no means of affording relief to such persons.

Mr. Daniell.—Poorhouses should be opened whenever there is evidence that helpless persons are suffering, old people, cripples, blind, widows, and children. I can hardly understand a case where relief works would be necessary much earlier than a poorhouse, and it is certain that after the persons on relief works can find employment at home, inmates of a poorhouse must remain until prices fall as they have no means of earning wages. Persons should from time to time be drafted from poorhouses to inefficients on the works when possible.

Mr. Crooke.—I do not believe that there are any circumstances under which a poorhouse should be opened without a labour test. Of course there are always a number of inmates—cripples and very infirm people—who can do little or nothing, but this does not affect the principle. As to *pardanishin* women, the only practicable way of affording relief is by establishing a native committee to collect the names of such people and distributing cotton to them, which they work up into thread and sell themselves or return to the poorhouse, where it is paid for, and a fresh supply of raw material is given to them.

Mr. Quinn.—The necessity for poorhouses arises as soon as distress begins. The beggar class of blind, cripples, lepers, &c., come on the hands of the district officers at once, and few of them can work. There are also a number of half starved wretches who have come in from the surrounding country, children who have been abandoned, &c., who must, for a time at least be fed gratuitously, municipalities can sometimes help.

Captain D. G. Pitcher.—So soon as the weaver class, a very large one, begin to show distress, a practical way would be to purchase, on behalf of Government, cloth in large quantities from these people at a price calculated to leave them a sufficient subsistence. This would keep large bodies of people at their homes, and the cost to Government should be little, as the cloth could be sold, when the distress was over, at but little loss.

Mr. Blennerhasset.—Poorhouses should be opened only for persons incapable of working, and only if it appears that such persons are in danger of starvation through the stoppage of ordinary charity. There are no other apparent ways of affording relief at this stage, except through private charity.

Mr. Lumsden.—Poorhouses should be opened to give relief in the shape of cooked food without a labour test to the aged, lame, blind, halt, and all suffering from such bodily infirmities as render it physically impossible for them to do any work.

Applicants of this description should be admitted into poorhouses as soon as it is clearly established that ordinary private charity is no longer able to meet the demands made on it for the support of the classes indicated.

Bengal.

BENGAL.

Mr. Barlow.—I have a great objection to poorhouses, which, from the nature of the case, are demoralizing to those who frequent them. In any case, however, where substantial relief is called for at all, poorhouses require to be opened for the homeless poor, and habitual mendicants who cannot do ordinary work. Such institutions would have to be continued throughout severe famine for obvious reasons. The time to open these institutions would appear to have arrived when the beggar class begin to congregate in towns, &c., and wanderers, other than beggars, are found going about the district in a reduced condition. The experience of 1873–74 seems to show that during distress in its early stages, places where food can be granted to the lame, blind, halt, and outcast races (like the mussahirs in these districts) require to be established in order to prevent loss of life. A considerable amount of relief was granted thus from what were styled "relief centres" as distinguished from poorhouses. I should generally explain the distinction, I think, by saying that the usual, though not invariable, conditions in case of the former were uncooked food with non-residence, while for the latter they were residence with cooked food. No decent person of any grade would resort to either of these places except under the most extreme compulsion. The chance, therefore, of deception is reduced to a minimum. Amongst the class who do apply physical condition is a simple and safe test. The system has certain advantages as a test and means of gauging the distress. In the event of distress continuing and a complete agency being developed to deal with famine, poorhouses may continue, but relief centres should disappear, or nearly so. Relief works, light labour, and house-to-house visitation should provide for all but the homeless and incapable poor.

The cost of relief centres as well as poorhouses has been in past instances met by contributions from private charity, supplemented by Government funds. Private subscriptions have, however, been so small that virtually it may be said that both kinds are forms of relief granted by the State. I do not know of any practical way of affording relief in case of moderate and temporary distress, other than those mentioned in the present and last answer, whether private charity be taken into account or otherwise.

Mr. Magrath.—Poorhouses should always be opened without a labour test. Where there are a large number of helpless beggars or infirm or sick people they should invariably be supplied with cooked food, and should be encouraged to work at spinning or twine-making or like labour. No person able to do a full day's work should be tolerated for one day, and separation of the sexes should be insisted on.

I do not quite understand the drift of this question, unless it embraces the whole subject of relief generally which I have no time to go into.

Mr. Hodgkinson.—Private charity is generally equal to the task of supporting the poor and infirm, as well as habitual mendicants during the early stages of distress. If the crowd of mendicants to head-quarters is found to be excessive, a poorhouse should be opened, and I do not think better rules can be laid down than those of Colonel Baird Smith in page 140 of Mr. Geddes' "Administrative experience of former famines."

Mr. Toynbee.—Under the circumstances indicated in the first part of the answer to question 6, it would not at first be necessary to open poorhouses at all. If the numbers on the relief works began to increase rapidly: if besides the ordinary non-landed or labouring classes and professional earthworkers, the poorer classes of agriculturists began to come to the works, and if the new arrivals appeared in worse case than those who had come first; if prices continued to rise and markets to tighten, and if professional beggars and the aged and infirm belonging to the poorest classes began to leave their usual haunts and wander about the country, then it would be safe to conclude that private charity had shot its bolt; that the well-to-do classes had begun to fear the pinch of coming pressure, and that their charity had from prudential motives confined itself to the home sphere; then it would be necessary to open poorhouses for such classes and people only as were quite unable to work. To begin gratuitous house-to-house or village relief at this stage would only tend to demoralize the whole population and to interfere with the ordinary domestic industries of the country. At the initial stage of distress, task or piece-work at the ordinary rates for those able and willing to do it, and poorhouses for those who are physically unable, seem to be the only two measures required under the ordinary circumstances and conditions of most districts.

Mr. Finucane.—No poorhouses were opened in my circle. I do not think poorhouses would be at all required in the rural districts of Behar and Bengal as long as famine was kept well in hand. If, owing to want of village inspection, delay in opening relief works, or any other cause, people were allowed in the early stage of famine to become emaciated and unfit for work, it would probably be advisable to keep such persons in poorhouses and have them properly fed and cared for till their physique should have so improved as to render it safe to draft them off to relief works. Temporary sheds might be also required for those social pariahs who, in ordinary times eke out a subsistence by begging from door to door, and who have neither caste-friends to give them aid and protection, nor homes to give them shelter. Persons of this class (known as *kalars* in Behar) are happily very limited in number, but their sufferings are in ordinary years greater (at least in the more remote tracts of Behar) than is generally supposed.

Mr. Henry.—The only persons who should be admitted to relief in a poorhouse without a labour test are—

1*st.*—Aged and infirm adults permanently incapacitated from work.

2*nd.*—Adults suffering from temporary ailments.

3*rd.*—Children.

Whenever an applicant for relief is capable of work a labour test should be exacted from him.

Those whom the State will have to support in times of scarcity can be divided into distinct classes,—

1*st.*—Those who are thrown on relief *for want of work.*

2*nd.*—Those who are thrown on relief because the spring of public charity, which formerly *maintained them in idleness*, has dried up.

These latter are our paupers, habitual non-producers, for whose needs a portion of the store which would be available for producers has to be abstracted. For these paupers only is poorhouse assistance a suitable form of relief. My experience in the famine of 1874 justifies me in stating that assistance given through a poorhouse is considered a degradation, and the recipients tend to become pauperized.

Caste feeling on the subject is not as marked as in former years, but there is a well defined public opinion which pronounces against relief administered through a poorhouse. To the indigent poor who are thrown on State relief temporarily, and whose distress is attributable to causes beyond their own control, our assistance should be given in such a way that their feelings of self-respect and independence are not undermined.

By keeping them in a poorhouse, severed from home and home associations, chronic expectancy, and a dependent spirit are fostered. I cannot write too strongly against this form of charitable relief.

Mr. Kirkwood.—I must except from the general condemnation of poorhouses the circumstances of large towns, where the congregation of habitual beggars, of the blind and halt, and of some homeless poor, incidental to a time of scarcity, may render the opening of such an institution for them, and for them only, desirable.

Baboo Hari Mohan Chandra.—When springs of private charity begin to dry up, relief should be given in poorhouses without a labour test to those only who are incapable of working on labour test. I do not see any other way of giving relief except through private charity.

BOMBAY.

Mr. Hewlett.—If poorhouses are opened at the commencement of a famine, they will be crowded with what I may call the normal poor and infirm persons and mendicants who are found in every village in India. I think to prevent an undue charge being made against the State, that discrimination is required in selecting cases for admission, but where there is a general emigration of the ordinary well-to-do people and the ordinary sources of charity to these people is cut off, then I think a poorhouse must be opened in some central point, to which they could be sent.

General Wilkins.—Poorhouses should be opened to give relief without a labour test only during the height of famine, when the extreme poor and distressed are unable to perform any work whatever.

Mr. Spry.—Poorhouses should only be opened when it appears that private charity cannot meet the occasion; and only those should be admitted who are unable to work, or who are only able to do such work as is given in poorhouses. I do not think that the State should interpose till private charity fails.

Mr. Charles.—Poorhouses should be opened without a test as soon as reports are received of any considerable number of cases of persons being found lying exhausted from disease and travel, by the roadsides and in the temples and dharmsalas.

The experience of the last famine showed by what route the streams of wanderers usually go, and relief houses should be prepared in the same places long before they are opened.

An arrangement for patrolling the chief roads, in order to pick up persons lying exhausted, should be made.

Mr. Ramsay.—When actual famine arrives, I believe poorhouses must be opened for those who cannot work, and who would die if not thus relieved;

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—
BOMBAY.

even when aided by Government money, these, I think, can be best supervised either by associations of private persons, or by municipal committees. Both these agencies were used in this district and with complete success. There have always been found native gentlemen of means and leisure willing to aid in this work, which involves finding out the persons in need of aid, and then seeing that the relief is properly distributed. Government need only provide medical officers and medicines, and money of course if available. Government interference is apt to wither up private benevolence. Local committees could be organized in every large town if necessary, and each could have its poorhouse.

Mr. Norman.—When it is found, from an accumulation of beggars in an emaciated condition, and from a careful village inspection, that distress is on the increase, it will then be necessary to open poorhouses at one or two selected places in each *taluka.* There seems to be no other practicable way of affording relief.

Mr. Robertson.—Relief camps or poorhouses must be opened to give relief without a labour test, wherever there are numbers who are destitute, and are unable from old age, sickness, or from weakness from want of nourishment, to perform any work; women far advanced in pregnancy, and weak mothers with sickly infants, must also be admitted.

As far as my experience goes, there are no other practical ways of affording relief at this stage, except through private charity, while that even requires to be placed under control.

Colonel Anderson.—When wandering beggars in a reduced condition begin to appear, evidently suffering from want of food, a poorhouse may be opened, but it should always be a closed house within which those relieved should be interned and some form of work at any rate should be exacted. Besides other reasons this is the only way of preventing relief being obtained there, and from private charity also; thus only can people with friends able to keep them be kept from being thrown on the poorhouse for support.

MADRAS.

MADRAS.

Mr. Price.—At the stage next succeeding that which calls for special works, and which is that when distress has deepened so far that parents are unable to obtain for their wages enough to keep their children from marked emaciation, when the poorer classes find that they cannot support the aged and infirm, when the weakly, owing to reduced food, grow still weaker, and when the artizan, especially the weaver, finds that the demand for his industry is falling off and his earnings becoming in consequence insufficient, and when sickness is increasing, I would take in none but the infirm, aged, the really emaciated, the sick, and children in bad condition. I would exact no labour test, but whenever any one was capable of doing something I would not allow him to remain idle. I know of no practical means of affording relief in other ways than this at this stage of famine. Advances to weavers tend to prevent their falling into idle habits and keep that section of them unable to perform manual labour out of a relief camp; but, on the other hand, this form of relief throws upon the hands of Government at the close of a famine a large quantity of cloth, of which experience has shown that it is very difficult to dispose. Distributing materials for spinning would require a considerable agency, and the same difficulty in disposing of it as occurs in the case of cloths would arise. Mat, basket, and rope making, &c., are professions which are carried on by limited and particular classes, and giving materials for these, which, in many places, would be very hard and expensive to obtain, would not, in my opinion, afford much relief.

Mr. McC. Webster.—Poorhouses should be opened as soon as it is decided to reduce the rate of wages on ordinary works to a famine "wage test." By such time there will be a number of sickly and infirm habitual beggars and others who are not able to work, and these must be provided for. There may also be cases of emaciation, few it is true, but still some, in the villages, and these people should be taken to the relief-houses and brought into a condition for work. I do not think private charity would be of any real use at this stage in affording relief, which should, as above remarked, be afforded by Government, first, by works for those able to work; secondly, by poorhouses for the weak and infirm; and, thirdly, when necessary by money dole for Purdah-nashin women and the sickly and infirm who are unable to leave their villages.

Mr. Martin.—When a famine is at its height, paupers will stray in large numbers into districts that are not suffering from famine, but in which prices are very high. They will especially resort to the larger towns, and will strain private charity beyond what it can bear. It will be necessary to open poorhouses when the condition of these people begins to get precarious.

Poorhouses should not be opened without a labour test.

Mr. Oldham.—It is always easy to open a poorhouse, and also to see when it is wanted, which apparently is not for some months after other needful relief operations are in force. The practical way of affording gratuitous relief is by village home relief. With the system of works near the homes of the distressed in force, and a very restricted home relief, poorhouses in the general sense of the word are not needed at all. Chumpárun, in 1874, was an instance of this. So was Adoni from March till May 1877. A small hospital or infirmary would suffice.

Major Mead.—No one should be allowed to remain in any Government poorhouse (except for a day or two when in the search of work) that is capable of work; those that are should be drafted to works as soon as practicable.

Poorhouses or relief camps should be opened when there are large numbers of wanderers incapable of doing work and evidently suffering from want of food.

Lieutenant-Colonel Hasted.—Poorhouses should not at this stage be opened by Government; private charity will, if organised properly, do what is wanted in large towns, but the organization can only be effected by the collector, vice-president of a muncipality, or other Government officer, to whom the people are in the habit of looking for guidance and assistance. Hospital sheds are at this time wanted, and might be attached to municipal and taluk dispensaries, the charges being met by Government. Deficiency of nourishment quickly induces disease, and the dispensaries cannot provide sufficient accommodation for in-patients.

Mr. Macartney.—At the early stage of a famine I do not think that the establishment of poorhouses is necessary or advisable. The mendicant portion of the population can be assisted at much less expense to Government. I would reserve the establishment of relief houses, to a later period of the famine, and for such of the younger and middle-aged portion of the population as from want had become temporarily unfit for work, but who, under the dietary of the poorhouse, might speedily be recovered for labour.

Ch. II. Qn. 7.

MYSORE.

Mysore.

Major Moncrieff.—At this stage poorhouses should not be open. Provisions will not yet be at famine rates, and the helpless poor should be supported by their relatives.

Mr. Ricketts.—Poorhouses would be undesirable at this stage. Private charity should, and I think, would do all that was needed, and where private charity was insufficient it should be supplemented by Government contributions on the condition that there was due discrimination used in distributing the charity.

Colonel Johnson.—If by poorhouses be meant relief camps, in which all-comers are to be taken in, kept, and fed for nothing, I cannot too strongly reprobate such an arrangement. At the same time, in the height of a famine it is absolutely necessary that there should be places at which the starving wanderer can be provided for. It is in the proper control of these places, it appears to me, that one of the chief difficulties in managing a famine lies. How to deal with men who will not work, and who, if they are turned out of a relief camp will starve themselves until re-admitted, is a question I have never seen practically answered yet. The difficulty has been got over by sending them on to a work, and paying them whether they worked or not, but I do not consider this by any means what ought to be done. Making a relief work in this manner into a regular Lungerkhana, certainly provided for a vast number of cripples, professional beggars, and other utterly useless and worthless members of the community, but it deterred a very large number of destitute respectable people from resorting to the works. The latter were willing to work and be paid up for what they earned, and would have come to a public work managed in the ordinary way where they could have got a pit to themselves, but they could scarcely be blamed if they declined to let their wives and daughters herd with and work beside the most abject scum of the country. I believe that many really deserving respectable ryots were deprived of the assistance which Government so liberally supplied, on this account alone, it having been frequently brought to my notice in the districts that men had refused to go to the works for this reason. In the arrangements generally made for relief, it appeared to me in short that the greatest amount of attention and assistance was devoted to the least deserving. From the time indiscriminate relief was thrown open at the so-called kitchens the skulkers became masters of the situation and remained so to a great extent to the end. By endeavouring to work them, moreover, with the willing the whole lump was leavened. Until some deterrent punishment be devised for people determined to starve rather than work this must always more or less be the case. So long as they are sure they will not be allowed to starve they will assuredly try it on.

Ch. II. Qn. 8.

Question 8.—Private Charity at Early Stage of Distress.

Is there at this stage of the operations any field specially appropriate for the intervention of private charity? If so, what is that field, and how should the charity be organized and directed?

Punjab.—7 replies are given. They indicate poorhouses and relief of purdah-nishin women as the objects of private charity.

North-Western Provinces.—24 officers answered the question in the same sense as the Bombay officers.

Bengal.—The answers, 11 in number, are mostly to the same effect.

Bombay.—9 officers answered the question. Private charity may be administered by committees, and applied to the relief, especially of purdah women and poor sick people in their homes.

Madras.—20 European and 2 Native gentlemen have replied to this question.

There seems to be a pretty general consensus of opinion that in the early stage of famine relief operations there is no field especially appropriate for the exercise of private charity. The main objection to it as a means of relief is the difficulty of systematising and controlling it, and unless judiciously administered it is certain to be abused, to clash with the organised measures of State relief, and to demoralise the recipients. This means of assistance it is thought might come into play more advantageously at a later period, which will be dealt with under Chapter III.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—When the distress has spread throughout the district, private charity might intervene and afford relief to the needy. Charitably disposed persons would, no doubt, be glad if they are saved the trouble of giving alms to individual persons, to subscribe a certain sum which will go in forming a relief fund. From last year's experience I am of opinion that it would conduce to the public good if a committee of management composed of official and non-official persons is formed at the head-quarters of the district. Persons subscribing to the relief fund might be invited to become members of it. The committee may be put in charge of poorhouses. Their duty will consist of (1), to regulate the scale of diet; (2), fix the time and manner of distribution of food; (3), determine whether cooked or raw food should be distributed; (4), make arrangement for lodging, &c. Sub-committees may also be formed in large towns. They will be guided by the rules framed by the Sadar Committee, and take instructions from them. The president of the Sadar Committee will be the head civil officer of the district. The committee will, besides other works, examine the accounts of the poorhouse. As this committee will comprise a large number of non-official members, they would be able to raise and collect subscriptions. The members of the committee will divide the work amongst themselves, and two or three of them will in turns supervise the distribution of food. The arrangements herein proposed proved very successful in this district last year.

Colonel Parsons.—The field specially appropriate for private charity is the relief of distress among persons wholly unable to labour. (*b.*) Charity can be evoked by means of committees of notables, and appeals by circular or otherwise.

Mr. Roberts.—In the earlier stages of scarcity which is likely to be temporary, the support of the helpless poor may be left almost entirely to private charity. In this district, up to the present, no help has been given from provincial or Imperial sources. The poor-houses were started, and for some weeks maintained with funds subscribed privately, and these contributions formed an important addition to the local resources. They were not, however, administered separately, but formed into one fund with the grants made by municipal and district committees. In times of severe famine the case would be different, as the private subscriptions would be completely swamped. If organized independently, the relief of *pardānashin* women would be a suitable field for the employment of private funds. So would the distribution of funds to aid farmers and shopkeepers in starting business afresh when the famine was abating.

North-Western Provinces and Oudh.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Sells.—The relief of indigent "*pardahnashin*" women is, at all stages of distress, a most legitimate object for private charity. At the commencement of severe pressure, the Government official, in the various towns, in concert with the most respectable and trustworthy residents of the muhallas, should be called upon to furnish nominal lists of such women who have no relatives able or willing to support them. I should myself regard a simple money dole, as, on the whole, more satisfactory than the requiring of an actual show of work. The strict maintenance of the latter system is likely to prove a difficult matter. On this point, however, I have scarcely had experience to justify any expression of opinion.

Mr. Sandys.—The relief of respectable women who cannot appear in public, and cannot therefore receive food at the poorhouse.

Mr. Cornwall.—As far as possible, I think that the above class of people should be left to private charity to support, the State only giving relief in return for labour.

Mr. Crooke.—The relief of *pardanashin* women is a peculiarly appropriate field for private charity. These people cannot be got at, except through native agency. A native committee consisting of native gentlemen organized and directed by a native district official is the most feasible means of working it.

Mr. Quinn.—The distress which drives mendicants and the labouring classes to the poorhouse and to relief works very quickly reaches the large class, which exists in all old towns, of indigent persons of respectable family, whose females are purdahnashin, and whose males have never applied themselves to manual labour. In ordinary times the men get employed as servants, bailiffs, &c. This class always live beyond their means, as their expenses, marriage, and other, are on the scale of the former and not the present means and position of the family. When famine approaches the men often lose their appointments, and women with no near relations cease to get charity from distant relations and caste fellows. The relief of this class, who may be looked upon as the victims of the Indian social laws, is a very suitable object for private charity, and this charity should be controlled and distributed by native gentlemen, who should be representatives of the class to be relieved. Where Government gives a grant in aid, proper returns showing the way in which charity is being dispensed must be furnished.

Mr. Blennerhasset.—Private charity might be employed to support the poor of the higher classes in towns and *parda-nashin* women, provided distress prevailed among these classes. Natives of wealth and position appear more ready to support these classes than low caste labourers.

Committees of influential natives in towns might be formed; it would be necessary, however, to associate some influential person or Government official to secure success in organization, and to prevent embezzlement.

Bengal.

BENGAL.

Mr. Worsley.—I am not in favour of any organized private charity at this stage of the operations. Zemindars should be strongly admonished on the subject of maintaining their own village paupers.

Mr. Magrath.—There is only one field that is in any way open to private charity, so far as I know, and that is house-to-house visitation. In this way only can we come at the "I cannot dig, to beg I am ashamed" class, fortunately rare in India. The wholesale feeding which goes on in famine time by rich people is not only not useful but baneful, as it tends to upset the organized labour gangs in the neighbourhood. The Burdwan Maharaja in 1866, I well remember, was obliged to invoke assistance from Government to prevent his charity from being abused, (1) by people who were getting relief elsewhere; (2) by people who had means of their own and were not fit objects for charity. Of course local charity may take off the hands of Government certain orphans and infirm people, but that is no great help till relief regularly closes. So far as I have seen it, private charity has so far as famine goes been absolutely useless, and we should have done as well without it, in some cases better.

Mr. Finucane.—In the early stages of famine municipalities and such local bodies might give employment in towns by carrying out schemes for drainage, embankment, opening up new streets, widening old streets, and the like. Government relief operations might be thus confined to opening of relief roads and similar works in the interior. Local committees might be also most usefully employed at this stage in seeking out and assisting distressed persons who are unable to work, and in making out lists of those who are likely to require State gratuitous relief at a later stage.

Mr. Abbott.—Indigo factories are so scattered over this district that they form perhaps the best centres for relief measures, and in almost all instances the planter will be only too ready to give his aid and the use of his buildings during non-manufacturing seasons gratuitously; his intimate knowledge of the villages, and the condition of the inhabitants, must be of far greater reliability than the garbled statements of the native police or zemindars, whose accounts are always more or less coloured, according to the light in which they fancy the views of the inquiring officer lie. Private charity is much better employed when passed through Government hands; the private food kitchens may be opened if the Government ones prove insufficient; money being given away should always be discouraged, as it tends to draw the people away from best labour and cooked food.

Mr. Kirkwood.—The following are methods by which private charity should, in the initiatory stage of a famine, be utilized.

A really earnest district officer can, and will, if he is wise, do much towards extracting the genuine good will towards distress which lies often in a somewhat slumbering state at the bottom of the hearts of native gentlemen, and towards bringing it into practical operation. This he can effect by inducing landlords and others of a similar position to look to the condition of their estates, to relieve gratuitously and immediately all scattered cases of serious distress which may arise before the Government machinery has got to work, to open at their own cost and under their own management works, such as roads and embankments, works for the improvement of drinking water, or for the storage of water for irrigation, and other works for the improvement of their property. The district officer should, if they apply for it, advance Government money to such landlords for such improvements, under rules probably somewhat modified in stringency from those applicable to such advances when made in ordinary years. Much good was effected in Bhagalpur district in 1874 in this way through the really valuable co-operation of several of the resident landlords. They proved themselves very serviceable tools, which, if not fashioned quite on European principles, could do good work in the hands of an officer who would take the trouble of adapting himself to their peculiarities.

BOMBAY.

Mr. Hewlett.—I think that the establishment in towns and large villages of *dúdkhanas* for the feeding of young children might be left to private charity, and also the searching out cases of distress among respectable families, especially among the women of the poor artizan class. If funds can be collected, a committee composed of Hindu and Mussulman members should be formed, and the members should visit the houses of their respective communities and report to the committee. Money should not be given, but grain or cooked food, and labour should be demanded, such as spinning or weaving.

Mr. Spry.—Private charity at this stage might well be directed towards relieving Brahmin widows and *Gosha* women, who, not appearing in public, may be reduced to great straits. Committees of charitable and influential native gentlemen might be formed to look after these cases, and also those of poor sick people who are unable to leave their homes.

Mr. Charles.—The gift of clothes and blankets seems to me the field especially appropriate to private charity, that is to say, that a sum should be given out of private funds to the relief officers, to be expended in giving warm clothing to children and weak persons. The Government famine operations are mainly devoted to supplying food, but there can be no doubt that great suffering and many deaths resulted last year from the exposure the famine labourers (more particularly children and weak persons) had to undergo, the cold and damp bringing on dysentery.

Mr. Norman.—Private charity can best be utilized by contributions to municipalities, whose operations must be supervised by public officers. It may also be devoted to the purchase of clothes to be distributed under careful superintendence at the various poorhouses. Some provision can also be made in this manner for the custody of orphans.

Mr. Bosanquet.—In this district at the commencement of the distress a committee was formed at the head-quarter station for collecting contributions and administering relief. Similar committees were formed on a smaller scale in the smaller towns in the district. For some months, owing to the private charity thus administered, the amount of gratuitous relief which Government had to give was comparatively small. I think the manner in which such committees should be formed and the nature of their proceedings, should be left to local circumstances.

Mr. Robertson.—Yes. Private charity can at this stage do much, by establishing relief houses, by clothing those at the relief houses who are in rags. But private charity must be controlled, it must not be allowed, by indiscriminate and ill-judged aid, to undo all the work of Government and cause the mass of the population to resort to begging. All private institutions should be so organized and directed as to act in accordance with the system enforced by Government, being thus a true aid both in means and in agents.

MADRAS.

Mr. Whiteside.—I do not think that there is any field to which private charity should be more particularly directed ; as I have said above, the less private charity is meddled with the better when famine is in its earlier stages. When the distress is very severe, and it is seen that the charity of private persons is being abused or misapplied, so that persons not really entitled to it are excluding from relief those really in distress, then it will be proper for district officers very cautiously to interfere and to point out how the charity should be best applied. But such interference is always very jealously regarded by natives. They believe that by allowing such intervention they lose some of the virtue acquired by their charity, and my experience in this famine has shown me that when the district officers began to show a desire to direct the exercise of private charity, such charity gradually was discontinued.

Mr. Grose.—Private charity seems to me to be dangerous when the time for poorhouses has arrived. People are generally ready to give money then on the condition that they may have a voice in the management of the poorhouses ; but it is essential that such places should be very strictly disciplined from the first and under the entire control of the collector.

The charity of neighbours who give their money directly to deserving objects whom they know is an unmixed good; but I do not think any organised charity can exist by the side of State relief till a time has come when the people, though not starving, are in great need of help to enable them to recover from the condition into which famine has brought them.

Mr. Knox.—I do not think that at this stage any organised private charity is necessary.

Private charity in general, when it consists in simply giving alms, except to helpless people unable to work, does more harm than good.

Mr. T. M. Horsfall.—Private charity (but not unless very *judiciously* and *conscientiously* conducted) is beneficial when famine begins to be severely felt in *towns*.

Mr. Lee-Warner.—My experience of private charity among the natives is that it is generously given, but grossly misapplied. The most appropriate field for the application of it will be found to be in connection with the local fund and municipal dispensaries, which are becoming every day more popular. Natives are very charitable in their own ways ; but they have no idea of supervision and control. There must be some shadow of authority over the institution, else, like ordinary

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MADRAS.

native charity, it will become unmanageable; and therefore it would be necessary, in my opinion, for the resident Government officer to have the supreme control over it. Persons to whom charitable relief is extended, but will not submit to control, should be left to shift for themselves.

Mr. Oldham.—Towns are always a field specially appropriate for the intervention of private charity at all stages of a famine. A committee would be formed. If it is weak in funds and working members, it can deal with the fixed and identified residents of the town who are in distress, and to whom out-door labour would be a special hardship. It can work by dividing the town into as many portions as are necessary, each portion being visited and managed by the member of the committee thereto appointed, or by a paid agency. If very weak, it can reserve for its work one or more such portions. It can relieve wholly gratuitously, or by affording in-door work suitable for the recipient. I doubt if it is wise for the State ever to undertake such operations, though I have seen them largely resorted to.

It can also, if strong enough, superintend a hospital attached to the town for the reception of all comers. Apart from this, it is only mischievous if the committee engages in any relief operations to which outside people can be attracted. But if very strong, it can afford out-door relief labour for the pauper residents of the town who are fitted for such work.

Mr. Cook.—At this stage of distress, I do not think there is any need for the intervention of private charity.

Mr. Macartney.—There is no doubt that at this stage private charity could, and ought to do much to alleviate the existing distress. Committees of the well-to-do portion of the community might be formed, subscriptions raised, and a system of relief organized for the necessitous and infirm poor in towns and important villages.

MYSORE.

MYSORE.

Mr. Ricketts.—Relief works cannot meet all cases of distress, especially as regards the respectable poor. Private charity can then step in appropriately and should be organized and directed by the amildar, especially with reference to avoidance of narrow views regarding caste as well as the supposed meritoriousness of feeding applicants irrespective of downright want.

II. QN. 9.

QUESTION 9.—LOCAL COMMITTEES AND NON-OFFICIAL CO-OPERATION.

To what extent and in what manner may the organization of municipalities and local fund committees, so far as they exist, be utilized in this stage? In the absence of such local bodies how could the co-operation of influential non-official persons be best organized and utilized either in connection with the regular district authorities, or otherwise? State specifically what plan would be suitable in your district.

Punjab.—7 answers. The opinion is that members of municipal and local committees may be utilized rather than the corporate bodies, and there is a preference for the employment of Government officials.

North-Western Provinces.—25 officers answered. The opinions are generally the same as those of the Bombay officers.

Bengal.—13 officers answered. The substance of the opinions is the same as the above.

Bombay.—Answers were given by 10 officers. The majority think that municipal committees may be utilized, and also local fund committees in a less degree, because their members are scattered. But supervision by a Government officer is expedient. The co-operation of notables may also be obtained, but not in an organized way.

Madras.—15 European and 3 Native gentlemen have replied.

Municipal and local fund boards are composed principally of natives of the country, whose assistance in administering relief in times of famine would be most valuable if it could be relied on. But, with comparatively few exceptions, this is not the case, and two of the three Native gentlemen who have replied to this question testify to the fact, and the remainder of the evidence goes to show that the organisation would be of little practical utility. Experience has also shown that the personal co-operation of influential non-official persons cannot be calculated on.

PUNJAB.

PUNJAB.

Mr. Wood.—In the Murree Sub-division personal supervision by the local authorities was the only means at hand, the leading natives being unable to devote much attention to the subject.

Colonel Parsons.—(*a.*) Municipal and local fund committees can be utilized in voting as far as funds at their disposal conveniently admit, provision for special and useful relief works, and grants towards kitchens for relief of distressed people unable to work. (*b.*) When no committees exist, village headmen and *Zaildárs*, where they have been appointed, may be invited to interest themselves in relief operations, and afford assistance in organization.

Mr. Coldstream.—Members of municipal committees are most useful in distributing charity to the deserving poor. The members in Hoshiárpur have each a circle allotted to them, and with the condition of its inhabitants they are specially acquainted.

The system of allotting funds at meetings of committees and calling each member to give an account of what he has spent, in more or less detail, is quite understood, and has been found to work well.*

The corresponding agency in rural tracts should be the *Zaildárs*, who are the representatives of Government in their respective circles. They are more certainly men of influence and position than members of the district committee; and being paid for their work by a small per-centage on the revenue of the villages of their circles, have the more inducement to

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* Yes; power and responsibility create interest.—A.B.

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Punjab.

co-operate cordially in any relief efforts, and can be more appropriately asked to do so.*

The *Zaildári* agency in this as in other matters is a reliable source of administrative strength to the district officer. Most of them might well be trusted with small sums to be spent in the distribution of charity.

They would distribute it through the *Lambardárs*, from whom they would take an account; and they themselves would in their turn render one to the *Tahsíldár*.

Mr. Roberts.—As to the supply of funds by local committees, see last question. The committees of Rewári and Farukhnagar have undertaken the whole management of pauper relief operations, and much credit is due to the Rewári Committee for the interest they have displayed in the matter. I do not think district committees can be usefully employed in the same way, as the members are all isolated. Any funds raised within their own circles might be entrusted to *Zaildárs* for distribution, but with these exceptions, I would not organize relief establishments anywhere, except at the head-quarters of tahsíls, where there would be some hope of effective supervision.

Mr. Nicholl.—Municipalities might be very largely utilized at this stage; most municipalities in large towns would give material assistance in money so far as the funds at their disposal would admit, and the members might with advantage be employed in superintending the distribution of relief, and in various other ways.

During the recent distress, the members of the Amritsar Municipality contributed largely to the amelioration of the condition of the poor of the town, by distributing private charity, superintending the distribution of food at the poorhouse, and in paying gangs of labourers.

Mr. Benton.—Any relief works that would be opened would, at least in the first instance, be works from municipal or district funds; and they would be executed, so far as possible, by the municipal and district fund establishments. The execution of small works is frequently made over to members of the municipal committees, and the arrangement answers. In a time of distress the same thing might be done for relief works, but I think it would be very necessary for the district officer, or some of his subordinates, to inspect the works frequently. The execution of district fund works has never been committed to non-official members of the district committee.

During the past year the payment of labourers on some of the relief works was entrusted to members, but they did not give satisfaction. It is possible, however, that if the execution of the works were once properly organized, and if the members were supervised and assisted for some time by the district officers, they might give valuable assistance in this way. It must be remembered, however, that they are all, or nearly all, illiterate, and are incapable of doing anything by themselves without the assistance of a writer.

If it were necessary to make a house-to-house visitation in order to reach persons who would rather starve than apply for relief to the district officers, or to prepare a list of distressed persons in any locality with a view to their being admitted to poorhouses or to relief works, the assistance of members of these committees would be very valuable. The *Zaildárs*, where appointed, would render similar service, and where no *Zaildárs* are appointed, any other rural notable of the same class. In each zail or Patwari's circle the *Zaildár* or other person in the same station, or a member of the district committee, and in towns members of the municipal committees, assisted by a writer of the committee establishment, might be desired to prepare lists of persons who were in want of relief, whether at a poorhouse or outside of it, or on relief works. The list would then be checked by a *tahsíldár* or district officer to ascertain that they had been prepared correctly. If it were necessary to establish numerous poorhouses, it might be advisable to appoint some of these persons to the charge of some of them; but close supervision would be necessary, especially considering that these persons are illiterate and very liable to be imposed on. If it were necessary to convey relief to the sick, cripples, or bed-ridden, these persons might be required to give the relief in presence of the *lambardárs* of the village. In the case of *pardah* women, usually some relative or person of the same caste might be appointed to receive it.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. Sells.—Municipal committees may well be utilized in all classes of relief. There will generally be some works of utility that can be suggested as suitable also for relief purposes, and municipal committees should so far have full authority to divert funds from the projects sanctioned, perhaps nine months or a year previously, in the budget, to any of a more suitable nature, if the emergency occurs. Municipal committees also are admirably adapted for the supervision and management of poorhouses, and for the distribution of gratuitous charity. In all towns of any extent, also, whether municipal or not, there will be some residents of position, influence, and character, sufficient to justify their being entrusted with money for the purpose of gratuitous charity. They can be formed into local sub-committees entrusted with funds by the central committees and bound to submit to the latter an account of all disbursements; and such people will also be found *ready* to assist.

Mr. Sandys.—There are municipalities and a local fund committee in this district, the members of which might be entrusted with the preparation of the lists of respectable women requiring relief and the examination and passing of applicants for admission to the poorhouse, and the management of all arrangements connected with the preparation of food.

Mr. Tracy.—In municipal towns the poorhouse should be a municipal institution, supported as far as possible by municipal funds and private contributions, and the management should be confided to servants of the municipality, under the supervision of the members of the committee. In this district (Moradabad) most of the influential men of the place are members of the municipal committee. They are associated with the district authorities in the management of the poorhouse.

Mr. Leeds.—The members of municipal and local funds committees, as being possessed of local influence and knowledge, may, no doubt, with advantage be associated with the officers of Government in the administration of gratuitous relief; but it is impossible to deny that, with the exception of a really public spirited individual here and there, they do not afford much assistance to the district staff. I would therefore avail myself, as far as possible, of their services, but without relying too much upon them.

Mr. Lawrence.—I tried utilizing members of municipal and other committees, but to little purpose.

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* As I pointed out to some of the members of the Commission at Simla, the old Jagirdárs were a sort of spring or buffer for times of distress. It was looked on as their duty to spend liberally in such years, and the Dharmsalas which retained grants borrowed largely last year and fed larger crowds as part of their duty.—A.B.

The work to be done is too large and the responsibility too great for non-officials to mix themselves up in it.

Mr. Whalley.—It is a good thing to have the poorhouse managed by a sub-committee of the municipality, and when poorhouses are wholly or in part supported by municipal funds the propriety of such an arrangement is obvious. I have not thought of utilizing a local committee as a corporate body, beyond consulting them on the opening of relief works. Such a committee might be useful, after fixed rules for the conduct of relief measures had been laid down and made known, to facilitate carrying them out, but I am doubtful of the value of such a committee for consultative purposes.

Mr. Webster.—In towns the municipal committees might be very useful in finding out and bringing to the notice of the district authorities cases of distress when the sufferer would rather starve than make his or her case public; these cases would or ought to be exceeding rare among men; but among women they are unfortunately common enough and call for our deepest sympathy. To search out and afford relief to such women as the customs of the country or their own infirmity prevents from claiming public relief is a task which municipal committees from their constitution are eminently qualified to fulfil. In the absence of such local bodies the district authorities should associate with themselves natives of position, influence, and integrity, and the committees thus formed should discharge the functions above noted. There are municipal committees in all the important towns in this division, and here I would work through them. Cases of distress of the above nature in villages should be sought out by the tahsildars and their subordinates.

Mr. Adams.—There are no non-official persons in this district whose co-operation could be made useful during the early stages of distress.

Nor do I think that the organization of the municipal or other committee would be found of any value here.

Mr. Stoker.—I do not think that any of these committees can be utilized as committees. Individual members of them, and also individuals who are not members, may be made useful.

In this district I would calculate on having to manage and administer everything through the ordinary official staff and such officials as—*e.g.*, the subordinate judicial officers, &c.—are not usually employed on any executive duties. Some assistance could be procured in the city from residents thereof in the shape of visiting a poorhouse, and the missionaries would, I have no doubt, give valuable services. Beyond this, I would not count on receiving even non-official information, much less active aid, to any extent worth considering. I, of course, reckon all the Court of Wards officials (who could be made very useful) as Government servants.

Mr. Crooke.—Municipal committees can be utilized to superintend house-to-house relief, principally of *pardanishin* women.

Colonel Fisher.—There being no municipalities in Garhwâl, I found that a circular letter addressed to the most influential non-official persons, pointing out the obligations they were under to help their countrymen, attended with the very best results. Thus at Srinagar a poorhouse was opened and maintained for about three months, when scarcity was at its highest point, by a joint organization consisting of the native extra assistant commissioner and the leading men of the mercantile community. In Garhwâl the people very readily respond to a call for duty of this kind; they value it as a recognition of their wish to help Government and the people. The native agency, if not hampered and worried with too many calls for statements and averages, manage the funds much more economically and make them go much further than a European officer, however experienced, could. A poorhouse managed by natives will buy grain also much cheaper than a district officer could in the same market.

Mr. Quinn.—The organization of municipalities is most useful. The municipal committee should, in time of famine, take in charge the relief, gratuitous or in lieu of labour, of the municipal poor. The committee should be broken up into sub-committees to look after municipal relief work, admission to the poorhouse, distribution of food, out-door relief of *purdahnashins*, &c. There should be a general meeting once a week. The municipal conservancy organization can easily be extended so as to include a local poorhouse or relief camp.

Local funds committees cannot be formed into a standing central relief committee, because they are composed of the leading men of all parts of the district, but each *tahsil* should have a famine sub-committee composed of the leading residents, members of the local fund committee or not.

Colonel Chamier.—There is only one municipality in this district, and that is at the *sudder*, where ample means of organization exist. The co-operation of influential and non-official persons is easily obtained and ungrudgingly given. It only requires that some Government official should be placed over them, for without a president, who takes his position by virtue of his official rank, bickerings are fostered in the committee, which really owe their origin to disputes as to precedence.

Captain F. Currie.—The municipal or local fund committee, as a body, is of no use. Only three native members in the former have leisure, energy, and are reliable enough to be of aid.

Mr. Lumsden.—In my opinion, municipal committees should in such times undertake the maintenance of the regular pauper population residing within their limits, unassisted by special grants from Government. By regular pauper population I mean such residents within municipal limits as might be considered fit inmates for a poorhouse; not *all* the lower classes residing within municipal limits, who on account of the dearth of ordinary labour and the dearness of the necessaries of life might come forward and seek employment on relief works. Towards the assistance of these latter classes municipal committees should contribute according to their means, but for the support of the former they should be held absolutely responsible, and in arranging for the expenditure of the funds at their disposal they should be compelled to put aside a per-centage of their income for this purpose, which might, if necessary, be invested, but in such a form as to admit of the amount being readily recalled when required.

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Mr. Barlow.—In all cases of distress, temporary or serious, the agency of a municipality, both as respects strength and quality, should well suffice to ascertain, watch, and meet the distress occurring within its limits. In this part of the country municipalities exist only in two or three most important towns in each district. Hence the committees are strong. The work would be distributed amongst the members, and be carried on under the direction and supervision of the chairman, who is usually a Government officer. "Local funds" comprise here road cess and educational committee men. All the planters and many of the native members on these committees would undertake the work of starting petty works and administering poorhouse and "relief centres" assistance, and they would do this duty fairly enough. The number of helpers, however, under this head is small, and the labour is likely to be neglected or abandoned if it grows extremely onerous in character.

I cannot state any plan for securing the general co-operation of influential non-official persons in the management of relief. Something may be done, and was done in 1873-74, by inducing landowners to undertake works of improvement. These provide labour, and can do no harm. When, however, we are concerned with watching and relieving distress, matters are different: not only does any bad arrangement defeat the object in view, but it does positive harm, as the people are demoralized by relief improperly administered. District officers may now and again venture to try relief work in the hands of some one who appears in every way qualified to administer it. So far, however, as my experience goes, the result is uniformly the same. When the inspecting officer goes round the thing is found to be a failure, relief is proved to have been badly administered or granted to the wrong people, and the relief works and houses have to be cleared. There is no want of willingness on the part of the better class of people to lend their help, but they are unfitted to carry out the duty properly. I would not entrust relief work to unofficial persons free from supervision at an early stage of distress, for fear of developing famine, and I would not leave it in their hands (unassisted) when famine had come for fear of failure and an undue waste of money.

Colonel Burn.—All such funds are at the disposal of the district officer, and should be only utilized through him by those he entrusts with distribution. I am strongly against divided authority in emergencies. Exceptionally in Durbhunga, a large zemindari like this raj should be called upon by the district officer to undertake the relief of its own entire villages, *i.e.*, where it holds the whole 16 annas of the village. In such case sub-relief officers in the mofussil should be enjoined not to interfere with, or add to, such relief operations, but to report to the district officer where they appear to fail. With the above exception the district officer should be supplied with an extra staff of European assistants, and all relief emanate from him and his subordinates, every landholder being invited to contribute to the general relief fund.

Mr. Magrath.—Municipalities are useful in only one way, and that is if the commissioner of each ward or mahalla will undertake to look up the poor of his own ward, sending those fit for work to such works as there are, and the impotent poor to the poorhouse, and supervising the issue of materials for the work of spinning, weaving, &c., and the other products of skilled labour. Local fund committees, so far as my experience has gone, have been dead failures; they have met to talk and pass resolutions when they ought to have been out at work. Influential non-officials are useful if they work with their own hands and brains, and do not leave the matter to their under-strappers; but they should distinctly undertake one particular work, the charge of a circle, the care of a poorhouse, or the like, and be responsible to the local authority under whom they work. In this way a number of the planters assisted me. One lady took very successfully charge of a poorhouse, one zemindar superintended the construction of a bund when the rains fell, and so on; but unless the work laid down for them is clearly and distinctly their own, and they decide to work it themselves, non-officials are more trouble than they are worth. With regard to my present district, I would utilize the Wards' Commissioners for the purposes I have described above, *i.e.*, looking up and finding out the poor. In the district I would assign special works to anyone willing to assist, but I would not employ non-officials as circle officers, as I think their employment in this way in 1874 led to a great deal of wasteful expenditure.

Mr. Hodgkinson.—There would be little difficulty of securing the co-operation of non-official gentlemen both in the station and the interior. In the station native gentlemen would predominate, while in the interior, owing to the paucity of influential native residents, it would be necessary to trust principally to Europeans. Many of the native gentlemen whose co-operation would be invited are members of municipal or road cess committees, but an invitation to them, because they held that position, I should hesitate to issue. In supervising workhouses and passing the candidates for gratuitous relief, these gentlemen would be most useful. In the interior the main work would fall very much into the hands of one, but in the station the work would be told off to different gentlemen by days.

Mr. Toynbee.—At this stage of the operations (*i.e.*, when the ordinary modes and sources of private charity had become inoperative in the manner described in the answer to question 7, and when it had become necessary for the State to open poorhouses) the duty of the district officer would be to call meetings of the wealthy and influential inhabitants of his district with a view of raising subscriptions to meet the cost of the gratuitous relief given at the poorhouses. The burden of supporting their own poor would simply, by this means, be transferred from the shoulders of those who, in ordinary years, contributed their share of it in proportion to their means, to the shoulders of the richest men in the district. It should be established as a leading principle that all funds for expenditure on purely gratuitous relief should be met by private subscriptions. The supervision of poorhouses might, as far as possible, be entrusted to those who contributed the funds, subject only to inspection by Government officers to prevent abuses. The personal influence of a district officer would always suffice to ensure the hearty co-operation and assistance of local zemindars and others who might, from their position, be safely entrusted with the expenditure of funds entrusted to them. In towns and municipalities, where specific areas, wards, &c., are usually alloted to each member of the municipal committee, this plan would be especially easy and advantageous. But, as said above, strict and frequent inspection, if possible by European officers, would be absolutely necessary to ensure the absence of abuses. Speaking for the district of which I am in charge (Patna), I can state that there would be no difficulty whatever in establishing poorhouses in towns, and also in the interior, without any cost to the State beyond that of inspection; and this could be done by Government officers of all departments under the district officer as occasion might allow.

Mr. Henry.—Accepting the ready-made division of ilaquas, I made a systematic house-to-house visitation, ilaqua by ilaqua, with the view of getting the names of those who were in distress. I soon found that the obstacles to correct classification were numerous and perplexing, and it was then I obtained the co-operation of the more influential native gentlemen. To the number of municipal commissioners were added the names of a few influential residents who, in view of the importance of the work, volunteered their assistance and formed a committee known as the Town Relief Committee.

To each member the ilaqua, or portion of the ilaqua area where he resided, or with which he was best acquainted, was told off. A copy of the list made by me of distressed persons residing in this area was given him, and he was asked to test it.

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Meetings were held weekly, and each member stated to the committee the results of his inquiries which were then discussed. The members had many sources of information closed to us officials, and through their instrumentality relief was given in some most deserving cases which could not have become known to me or my salaried subordinates. Families which had become reduced from comparative ease to poverty, but who from feelings of independence and self-respect were unwilling to present themselves as claimants for State relief, had less hesitation in making the urgency of their wants known to their fellow townsmen. The members of the committee inquired into the circumstances of each person whose name was borne on our lists, and placed me in possession of information which caused me considerably to modify and alter the relief registers. Many names were expunged and many added. In the end, I am satisfied that none but those who were in actual distress received relief from us.

With a hastily put together establishment, it was to be expected that cases of fraud would occur. The members of the committee were an admirable check over the small salaried subordinates. Complaints which in any ordinary way could never have reached me were freely made to the members, who represented them to me. I was thus enabled to exert particular watchfulness over any subordinate suspected of malpractices. Finding dishonesty was likely to result in detection, even those predisposed to fraud were less likely to indulge in it. In the municipal establishment I found a ready-made agency to assist in relief work. The assessors and collectors of taxes knew each and all the houses, and furnished me with complete lists of them. They had in many instances acquaintance with the inmates, and were able to give much useful information. By utilizing this existing agency, establishment charges were kept down, and we were better served than by men temporarily entertained, of whose antecedents little would have been known. The co-operation of these members of the committee ensured,—

1st.—That only those who were actually in distress received relief.

2nd.—That the relief given by the State reached those for whom it was intended without being diverted by dishonest distributors.

The work done for Durbhunga town by the members of the relief committee could in all cases be done by influential native gentlemen. The formation of a committee is only practicable in towns.

To invite the attendance of country residents living at a distance from head-quarters would be to take up more of their time than they are willing to give. But where there are in villages respectable men with local influence, they can be utilized in supervising the distribution of relief, and in reporting on the conduct of the subordinate agency. Reports could be called for from them, and when in the villages the inspecting officer should discuss with them all necessary points connected with relief.

Mr. Metcalfe.—Before distress becomes very general, the organization of municipal bodies may be utilized in dispensing relief; but if the scarcity is widespread, it is more convenient, for the sake of discipline and uniformity of relief, that Government officers should be employed than that the services of non-official persons should be called in, for it is far easier to organize relief through officers accustomed to carry out orders than through outside agency from whom it is always difficult to obtain returns and reports.

Mr. Kirkwood.—In the initial stage of a famine, municipal and local fund committees may be of much use.

Dispensary Committees may be stimulated into retaining the services of extra doctors to peer about in those parts of the district in which severe distress may appear imminent. If these extra native doctors carried with them a packet of drugs and some substantial food, such as any meat essence prepared for soup, they would be of great service. A little strong soup has often, as I have myself seen, a very re-vivifying effect on emaciated frames unaccustomed to so stimulating a diet. It often stops the progress of decline and enables the recipient to summon up energy to recover.

Road Cess Committees may be incited to commence their road operations earlier in the season than usual, to expend more than usual both on their main lines of road and on scattered village works, to turn their attention and their funds to earthwork more than to bridges and masonry, to draw on the surplus savings of previous years.

Municipal Committees may similarly be invited to put in hand any work requiring unskilled labour which would benefit the town, and for which funds are available. But I would not, merely because there happens to be a famine, cause any committee to rush into debt with the object of expending large sums on the relief of the poor by affording them suitable employment, unless that labour is really needed by the committee and they are anxious to secure it. They can only be asked to aid Government to the extent of their available funds, and that in a preliminary way, before Government relief officials have had time to get to work. Anything further than this should depend on whether it would be advantageous to the taxpayers whom the committee represent.

Missionary assistance and the assistance of all other reliable persons, whether official or non-official, whose calling may take them much about the distressed tracts, should be enlisted at this period by advancing sums of Rs. 200 or Rs. 300 from the relief committees' funds to each, requesting them to expend this amount as economically as possible on such cases of urgent distress as may be brought to their notice, and to keep an accurate account of their disbursements. They should also be invited to submit to the district officer short weekly reports of the state of the part of the country with which they are acquainted.

Baboo Hari Mohan Chandra.—The local committees may be made use of in ascertaining the nature of the distress, the state of crops, selecting relief works, and collecting information on similar other matters only.

Baboo Ramani Mohan Chandra.—On the very commencement of the distress particular care should be taken to keep the markets well supplied by importing rice to a quantity estimated to be sufficient to make up the loss of the crop yields, and massing it in convenient localities in the several parts of the district, and disposing of it among small traders to transport throughout the district. This method, without taxing the free course of trade, would materially prevent distress. At the same time, zemindars should be encouraged to import rice, and advances of loans should be given to them where they are willing to take, and exertions should be made to advance money and grain to the ryots, through the medium of the zemindars, large jotedars, and lakhirajdars, who should be made to stand as securities for the advance. In the height of the distress poorhouses or annochhatras should be opened to give relief to those who are unfit for work and who would not at any rate work, such as habitual beggars and helpless women and children. In this stage of the distress, relief works should be opened for the labouring class. In this district the agricultural tenantry would not go to any distance to join the relief works leaving their families and agricultural operations behind. The next consideration should be directed for the organization of relief circles, which should be made in the different parts of the district under competent officers, each comprising an area which can conveniently be supervised by them.

BOMBAY.

Mr. Spry.—Both municipalities and local fund committees can and do assist much in seasons of distress. The municipalities of this district exhausted their resources, and in some instances also contracted loans to enable them to keep up relief works during the late famine. The members of local fund committees are more useful as individuals than in their collective capacity, as they can look to relief matters in the places where they respectively reside. At the beginning of the late famine, meetings were held in each place of any note in this district, and large subscriptions were raised in many places to relieve distress. The leading men formed themselves into committees, and in a most praiseworthy way superintended the giving of relief. In fact for months these relief committees existed till April 1877, and some even after, quite independent of State aid. The only thing to initiate this voluntary movement was for the taluka authorities (the assistant and deputy collectors and *Mamlutdars*) to hold meetings, and to start subscription lists, &c.

Mr. Charles.—Local fund committees are of no use in relief matters. The members live at great distances from each other, and could not be got to co-operate.

Municipal committees are of some use, and might be given work to do, but this depends on the composition of each committee.

The danger of using any such bodies is that they do not understand or appreciate Government rules for relief, and tacitly work against them.

The relief house managed by the Hubli and Gadag native committees got into a state of perfect confusion, the distribution of food being more like a scramble among a lot of wild beasts than human beings, owing to the committees never insisting on any strict procedure, and attempting to give a small dole to almost all who applied, or succeeded in elbowing their way in.

The co-operation of non-official persons is most valuable in bringing to notice cases of distress, house-to-house visiting, &c., but, so far as I have seen, it is worse than useless in any executive work or any organization that requires firmness and the management of bodies of people.

Mr. Percival.—Influential people are very ready to co-operate with the district authorities in organizing relief, and there should be a committee formed in each *taluka*, headed by the *Mamlutdars* and advised by the assistant collector or collector. Municipalities may be utilized, but not the local fund committees as at present constituted.

Mr. Propert.—Both are useful at all stages of distress. As I have before stated, municipal committees should buy grain in the cheapest market, and retail it at cost price. Later on, the same committees, with extra members added to their number from the outside public, can manage charitable subscriptions, invite loans without interest for the purchase of grain, and manage the expenditure and payment, repaying the same when the market becomes easier. They also are available for selecting persons entitled to gratuitous relief. In Khandesh they also superintend the distribution of cooked food at public kitchens; in fact as regards my own province, the municipal committees, where such existed, supervised all details of relief (except public works) in their respective limits.

The local fund committees as a rule cannot be employed to the same extent, as the members are scattered throughout the *talukas* or districts. They can, however, supply work from the funds at their disposal, and to a certain extent supervise the same. If, also, individual members be active and public spirited, they will seek out and bring to notice deserving cases, they will bring those in distress on to relief works, and otherwise make themselves useful; but the local fund committees cannot be employed as agents for relief to the same extent as members of municipalities.

I should never trust much to non-official persons. A few may possibly do good service in various ways. When these few are discovered they may be utilized. Private individuals may be employed as members of charitable committees, supposing them to have assisted in raising charitable funds. The district authorities must not look to non-official persons for any assistance involving regular work or sacrifice of time.

I cannot answer this, as I should never count on active assistance from private individuals.

Mr. Norman.—The local fund committees, as they at present exist, could not be utilized. I explained above (Q. 26, chapter I.) how the services of municipalities might be made use of. In large towns there would be no difficulty in organizing special relief committees, but in every case it should be insisted on that some experienced public officer should have a preponderating influence at the deliberations of the committee. If this be not insisted on, much money will be wasted, and charity will be granted in a reckless extravagant manner.

Mr. Hamilton.—In my experience non-official co-operation would be quite useless.

Mr. Bosanquet.—The opportunity of the occurrence of a famine should be taken advantage of for pushing forward municipal or local fund works of a useful nature. Loans might, if necessary, be asked from Government for the purpose. In later stages of a famine, when private charity is about to become exhausted, it would be right for municipalities to support their own poor who on inquiry are found to have no friends who are able to do so. Independently of such organizations, however, where they do not, influential members of the community should be encouraged to form committees for collecting contributions for relieving the distress, and deciding on the mode of their utilization. Such committees could not be formed without the active assistance and co-operation of the chief revenue officer on the spot. There may be exceptions to this rule, but speaking generally the committees can do nothing without a head, and no one can be that head except the officer representing Government on the spot. There are indeed persons of wealth and influence in most towns of any size, but mutual jealousy and distrust engendered by party feeling would generally operate against anyone being acknowledged to be the leader and chief actor in a great public movement. I have found by experience in municipal affairs that matters will not work well if anyone but an officer of Government is the chairman of a committee.

Mr. Moore.—Municipalities might be utilized to foster the above object, but their funds in this district would be insufficient, and local fund committees could not be utilized; they consist of a few people scattered about a *taluka*.

Mr. Robertson.—From experience I may say that everywhere the municipalities gave great and material aid. In some cases this aid was of the very highest value. The more intelligent of the members formed themselves into a famine committee, and by their influence raised funds and kept down the distress. In one or two municipalities they entirely supported their own poor, and did not, during the whole famine, receive any aid from Government. The local fund committees did nothing, and will, I hold, never do anything in giving aid in a famine.

Not only is it quite impossible to draw up any specific plan to obtain the co-operation of influential people, but any plan, however skilfully drawn up, would, when required to be carried out, be found to be a pretty plan on paper and practically of no value. In this presidency the district officers move about the districts for seven months in the year. They thus know all the influential and well-intentioned people. And a district officer, if he is worth anything, has himself a position and influence amongst these persons.

In the case of the aid of such persons being required, it could best be obtained by the district officer placing himself in communication with them, in some cases getting them to call meetings, and in others himself calling meetings and then framing committees for action. Everything will depend on the men the district officer has to deal with, while the circumstances of the day will have no mean influence on the matter.

MADRAS.

MADRAS.

Mr. Whiteside.—When matters are clearly becoming serious, the assistance of municipal commissioners and of members of local fund boards may, with great advantage, be invoked to organise a house-visitation in large towns, and to make lists of persons really in distress, as also to supervise the distribution of doles to them. This was the system that was had recourse to during this famine, and it was found to work generally satisfactorily. I do not think it would have been possible to have properly distributed the large sums of money from the Mansion House Funds but for the assistance rendered by these native gentlemen. In this good work many non-official native gentlemen also afforded cheerful assistance; but this was only in large towns. Out in the taluks of this district the great bulk of the population are very poor, and there are extremely few large landed proprietors whose assistance can be called in. Not a single one of the great Zemindars of this district took any direct *personal* interest or share in the distribution of charity throughout the famine. Whatever was done by them, or in their name, was supervised by their subordinates; and this extended also to the attendance of Zemindars and Jaghiredars even at meetings of the committees for the distribution of Mansion House Funds. Not one Zemindar or Jaghiredar attended such a meeting in person, but merely sent their dewans or secretaries. They did not even send their sons to represent them. It will, therefore, in the event of such calamity as a famine again occurring, be idle to expect such native gentlemen to take a direct share in the exercise of any scheme of charity.

Mr. J. G. Horsfall.—The municipal commissioners might be utilised in their respective towns. Each commissioner would have a division of the town allotted to him and would, with the assistance of a sub-committee, be able to ascertain correctly the condition and wants of the residents in his division.

Local fund committees cannot be so utilised.

Mr. McC. Webster.—The action of the local fund boards and municipalities should be confined to seeing that at the earlier period of distress their budgeted works were carried on and all applicants for work admitted. Further than this the services of the individual members could not be utilised, and besides I do not think their intervention necessary. The members would, of course, be chosen to act on local charitable committees whenever a subscription was opened later on.

Mr. Grose.—At this stage the organisation of municipalities and local fund boards is of no use as it at present exists in this district.

Mr. Price.—In Cuddapah the vice-president of the municipality, a native surgeon and very intelligent and active officer, aided by one or two of the commissioners, managed, in a very satisfactory way, a feeding kitchen maintained from private funds assisted by a Government grant. This was before village-relief began. After that period the Government officers took over the whole work of relief. If the members of municipal and local fund boards would, generally speaking, take an interest in matters, they might be of great use in looking up cases of distress and pointing out where help was required. I requested one member to assist me in the matter of gosha females in want, and he gave me a return of 1,200; on checking his list by other agency the number was reduced to something like 70, and it was found that the commissioner had put on the list several of his own relatives who were not in straitened circumstances. After this experience I thought it advisable not to make any further attempt to enlist services not tendered.

Mr. Austin.—Municipal committees might to some extent be utilised at this stage, but not local fund committees. In the absence of such bodies private committees might be organised and to some extent rendered useful under the immediate supervision and control of district officers. In the town of Vellore (with a population of about 40,000) a committee composed chiefly of municipal commissioners with a few Europeans and presided over by Major McLeod has worked most satisfactorily in the distribution of charitable relief (Mansion House Funds). A house-to-house inspection was made and inquiries as to the condition of each applicant most minutely held. The town was told off into sections under various members of the committee, and thus the labor of inspection was divided among them. On the whole the system worked well, though unfortunately some grave frauds were committed by a leading member of the committee.

Mr. Soobien.—The services of members of municipality and local fund boards may be utilised in supervising the distribution in towns of Government gratuitous relief when it becomes necessary. But as matters are at present, when public spirit has not developed to any large extent among the leading public men, and when public-spirited men are therefore at a discount, I do not think the gratuitous willing service of the municipal and local fund members for supervision and other purposes can be much calculated upon.

Rev. Newport.—So far as I know this district, this utilisation of non-official help is only possible in the municipal towns and the head stations of the taluks.

MYSORE.

MYSORE.

Colonel Sankey.—This question deals generally with the means for utilising all local machinery, and particularly the non-official classes, in suppression of famine. From the memorandum,* which I drew up in anticipation of extraordinary measures being required in Mysore in 1873, and circulated for guidance by order of Sir Richard Meade, it will be observed that the agency proposed to be employed in giving out the local work required was that of "Work Committees," composed of officials and non-officials.

The system here relied on was—judging from the extensive machinery of village, and house-to-house inspection that it has been found necessary to institute in managing the late famine—not only practicable, but capable, when once set on foot, of any desirable expansion. It need not, as suggested in the circular, have stopped short with Division, District, and Talaq Committees; but, in addition, *Magani* and *Hobli* Committees might be formed for groups of every twenty or thirty villages.

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* Memorandum on the procedure to be observed in regard to Famine Works—Public Works (Mysore) Circular No. 134, dated 30th July 1873.

It is universally admitted that, of all classes of native officials, the village *potail* is the man least corrupted by contact with our courts and offices; and as men of this class, with the well-to-do ryots, would be the workers on these minor committees, and are intimately acquainted with the villagers and their circumstances, as also with the earth-work needed in tank repairs, &c., they would prove of the utmost value if called on loyally to perform their duty during famine, and if cheered to the work with the same spirit as if an actual invasion had to be met and repelled.

On the outbreak of famine these committees would soon furnish lists of ryots and invalids, who ought to be encouraged to remain in the villages, and be provided with work there, or be specially cared for; and of the able-bodied labourers and hangers-on, who ought to proceed for employment to any indicated point where work was provided.

These and other details are, however, such as should be elaborated easily by the Civil Officers, who have had full experience of the late famine; but I will not at the same time disguise my opinion that, alongside and in support of these measures, something equivalent to placing a province in a state of siege should be proclaimed and put in force. This measure, and the reasons for it, I ventured to submit for the Chief Commissioner's consideration in Mysore (see paragraphs 46, 47, and footnote, page 5, of Appendices to my *printed Collection*). It would, however, be useless my entering into the matter further here.

Major Scott Moncrieff.—At this stage municipalities ought to be mapping out their towns and securing the services of volunteer beat inspectors so as to have the famine machinery ready in case it really is required. Registers may be in preparation denoting where distress is likely to occur in the town. The inspector should be found from among members of the municipality. Probably there will be found shopkeepers, employés of Government, &c., who will be content to work unpaid. If there are any native gentlemen of influence resident in the country they should be asked to co-operate, to assist in village inspections, to advise the district officers, to try to induce coolies to go to works, &c.

Mr. Ricketts.—The local fund committee would not be of much use. Municipalities where they exist would be invaluable, and in the other larger towns the amildar could always secure the services of suitable and efficient men. They would collect subscriptions, keep accounts, and supervise the cooking of food and its distribution to really needy recipients.

QUESTION 10.—VILLAGE INSPECTION.

Have cases occurred in which such measures as those referred to in paragraph 31 of chapter III., regarding village inspection, would properly be introduced during this the earliest stage of distress?

Punjab.—5 officers reply. Opinions divided, but majority think village inspection useful, even in early stages.

North-Western Provinces.—Opinions are divided, but the majority doubt the propriety of village inspection at this stage.

Bengal.—Opinions are divided. Several officers consider the knowledge obtained by village inspection important in the early stages of distress.

Bombay.—Answers unanimous in the negative.

Madras.—16 European and 3 Native gentlemen have replied to this question.

The general opinion is that as regards the sick, infirm, and bed-ridden folk in towns and villages, who are ordinarily cared for by their friends, actual relief at the early stage of distress is not only unnecessary but inexpedient. It is, however, desirable that a register of such persons should be prepared as soon as there is the slightest indication of the distress assuming a permanent character, so that when the time comes for bringing them under State relief, which will be when it becomes necessary to open poorhouses, the measure may be promptly and systematically carried out.

PUNJAB.

Colonel Parsons.—Cases undoubtedly occur in which in early stages of distress village inspection would be beneficial; as regards late distress in this district it was chiefly among persons from Jummoo territory.

Mr. Coldstream.—I believe that when the necessity for relief work arrives, there comes, *pari passu*, a necessity for village inspection; or if not an absolute necessity, village inspection, if then applied, would do some good, and probably prolong *some* lives; but it is always a difficult question whether, with ordinary regard to economy and common sense, the point to begin has arrived.

Mr. Roberts.—Yes, in towns but not in villages. Inspection and inquiry into such cases have been made by individual members of municipal committees, and on their reports the names have been registered. Relief is given to them in cooked food distributed to some child or relative who can come for it, or, if this is not possible, it is conveyed by the committee through their own servants.

Mr. Nicholl.—Cases such as that referred to in paragraph 31, Chapter III., have *not* occurred within my experience.

Mr. Benton.—A commencement was made of preparing lists of distressed people in villages in November last year in the manner indicated above; but no use was made of them, as rain fell immediately after and entirely changed the state of affairs. This was before I joined the district. Possibly in any case the measure was premature, and should only be resorted to when famine has been established for some time.

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Mr. Sandys.—At the earliest stage of distress the cost of village inspection would not be justifiable. Lives of some of the sick, infirm, and bed-ridden folk might no doubt be saved if the inspectors had power to send all such persons to the poorhouse. The same would also, though in a lesser degree, be the case in an ordinary year.

Mr. Whalley.—I am an advocate for village inspection in the very earliest stage of distress; nothing certain can be known without it. It may be known that causes that must produce distress are at work, but their effects cannot be gauged without village inspection.

As an instance I may mention that in the district of Rae Bareli last January, when no relief works were on foot and the applicants for admission to the poorhouse were few and far between, careful village inspection disclosed the fact that whole hamlets of Lodhas and Koris were dying of starvation, and their condition was wholly unknown to the pargana native officers, and hardly more than suspected in the parent villages half a mile distant.

Mr. Adams.—I doubt if it is the duty of Government to seek out paupers and compel them to receive relief, and I certainly cannot think that any such process is allowable in the early stages of distress.

Mr. Harington.—I doubt if any cases have occurred calling for more village inspection than is compatible with existing means. The *chaukidars* are getting into the way of reporting village distress. A *kanúngo* or other official is, or can be, sent to those villages in which the distress is rampant. To introduce any general system of village inspection, admirable as the course would be on broad principles of philanthropical sentiment, would be the first stage in the general demoralization of the people, would saddle the Government with a burthen it would never perhaps shake off, and would do more than anything else to check the legitimate means of assistance, the workhouse and relief works. People of the class named should be relieved by their own landlords. They should be encouraged to come to the poorhouse or hospital, and every facility given for their transport. The dying who deliberately preferred to die at home should be allowed to die there in peace. The landlords should, however, have pressure put on them to provide sufficient grain for their support, and might be helped by a small grant in aid for the purpose. This kind of relief should, on the part of the State, only be resorted to in cases of extreme necessity and closed as soon as possible, unless the State be willing to undertake the task of maintaining every old crone who finds life a burthen, every cripple who prefers his village to the poorhouse, the sick who will not go to hospital, and the bed-ridden who long to die. If the State be ready to accept this task, it need not wait for a year of famine to commence its operations. The temporary distress is at all times sufficient to provide such objects of its charity in abundance. If, in defiance of economic truths, the State be determined to enter on a philanthropic crusade against want, it might do well to supplement its legitimate resources by an appeal to the benevolent public of England, always ready to back up freely with solid coin the sentiments which it delights to insist on through the public press. Justice to its producers seems at present called for from the State before generosity to its non-producers.

Mr. Blennerhasset.—Cases have occurred in which sick, infirm, cripples, and similar persons have been found on the verge of starvation unable to leave their homes; they were removed to the poorhouses. A certain amount of village inspection appears necessary at this stage.

BENGAL.

BENGAL.

Mr. Barlow.—House-to-house inquiries have only been undertaken in my experience after complete arrangements to meet famine have been carried out. It is in fact thus alone that agency for the work is made available. I should, as before suggested, like to see such inquiries made in the worst parts of the country during the earliest stages of distress. Their object in such case would be not so much the granting of relief as the ascertaining the real condition of the people. The difficulty in this direction is want of agency.

Mr. Hodgkinson.—In the earliest stage of distress I do not think village inspection, in order to administer relief to cripples and infirm people, is called for. Private charity will generally maintain such persons up to a much later stage than is, I believe, intended in this chapter. The introduction of village inspection at this stage would involve an amount of cost and labour quite incommensurate with the result, and as tending to weaken and restrict the operation of the sacred duties of charity amongst the people is to be deprecated.

Mr. Toynbee.—I know of no such cases. In the earlier stages of distress it would not be advisable to introduce village inspection. Such a course would lead the people to believe that they were to look to Government only, and not to themselves for help.

Mr. Finucane.—Cases of the kind referred to in this question did, I believe, occur in Tirhoot in 1874. Had village-to-village inspection been begun, and had relief works been fully organized and started at an earlier date, such slight mortality from starvation as did occur would probably have been altogether obviated and the sudden rush to relief works, which occurred in March and April, would not have taken place.

Mr. Henry.—It may happen that in some particular villages the failure has been more serious than over the general area. For them the earliest stage of distress is soon reached. While their neighbours hold, still unconsumed, a portion of the late harvest, they may have entered into the earliest stage of distress and have passed into the stage of actual famine before the general area is seriously affected. To meet a case like this village inspection should be introduced. My experience from village inspection in the famine of 1874 was that the mass of the people appeared to be in good case, with one well-marked exception. I found children at the breast in advanced stages of weakness and emaciation, their mothers appearing to be in normal condition, or at any rate not showing signs of want of food. The only explanation I could get was that all the people had been living on less than their usual quantity of food, and this enforced abstinence had re-acted on the mothers drying up or impoverishing their milk. I believe that from this cause many small children pined away and died. Village inspection in the earliest stage would be effectual in this case also.

Mr. Kirkwood.—As I have remarked at length in replying to question 31, chapter III., the arrangements for village relief should be made at a very early stage when anything like a serious famine is impend-

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ing. The evils of a delay in such a matter are abundantly apparent in the history of the Orissa famine of 1866, of the North-West famines of 1860–61 and 1868–69, of the Behar famine of 1874, and, perhaps more than all, of the Southern India famine of 1877. When the main crop is harvested in December and January, the village inspections should be on foot in November, and should be completed in January, registers having been drawn up showing the dates from which needy persons will have to be relieved and the manner in which that relief should be given. The gratuitous method being by distribution of raw food or money at or close to the villages, the first of these gratuitous distributions should be in February, or if necessary, at the end of January. Other relief, such as that afforded by earthwork, should of course have been going on for months before January.

Baboo Hurish Chandra Roy.—Measures referred to in paragraph 31 of chapter III. ought to be adopted during this stage of distress, for, during the late famine, cases occurred of persons of the class named therein standing in need of relief, and suffering from a sad want of food, so long as their cases were not brought to the notice of the relief officers.

BOMBAY.

BOMBAY.

Mr. Spry.—Cases such as are alluded to in this question have not occurred that I am aware of.

Mr. Charles.—I know of no cases where a search for bed-ridden persons would be necessary in the earliest stages of distress.

Mr. Propert.—No, I have not found that the sick, infirm, cripples, and bed-ridden have come upon our hands during the earliest stage of distress. Such are fed by their friends as long as possible. As regards Khandesh, however, it must be remembered that scarcity only, not famine, existed.

Mr. Norman.—In the earliest stages of distress I do not think that the measures referred to would be necessary. The district and village officers would give timely notice, and the latter should be held personally responsible that no person in their villages is allowed to die of starvation.

Mr. Bosanquet.—I do not think that special measures like those referred to in paragraph 31 of chapter III., regarding village inspection are required in the early stage of distress.

Mr. Moore.—Not to my knowledge, and such steps are, I consider, premature at the earliest stage of distress.

Mr. Robertson.—No such cases have occurred. At the early stages of a famine the people, who are naturally kind and charitable, do not fail to help their poor. When, however, distress becomes keener, then such cases arise.

MADRAS.

MADRAS.

Mr. Whiteside.—No. At the earlier stage of a famine there should be no direct interference on the part of the State. Private charity should be left to take its own course unfettered. As soon as private persons see that the State or public charity is prepared to intervene and to assume that duty which they hitherto have unsolicited been performing, the springs of private charity at once begin to dwindle and dry up. Public charity in times of distress should not be had recourse to until it is manifest that the evil has attained a magnitude that is beyond the means of private individuals to arrest.

Mr. Grose.—I consider village inspection by famine inspectors having circles like Revenue inspectors essential from the time that the necessity of having poorhouses becomes probable. Till then the Revenue inspectors and the village corporation will do what is wanted. From these chiefly will come the information as to when poorhouses are wanted.

Mr. Sewell.—I do not think that, in the earlier stage of famine, any special organization is required for this class.

Mr. Martin.—Yes; I think that in some of the worst villages of Pulney Taluq, a village inspection should properly have been introduced if there had been an establishment for the purpose. Their case was met by relief houses, but not so completely as by a village inspection.

Mr. Lee-Warner.—If any thing dries up the springs of private charity, it is Government interference in the villages at this stage.

Mr. Austin.—In my opinion the moment it is an established fact that famine is imminent, village inspection under close supervision cannot be too soon organised.

My opinion now is that there will always be parts of taluks in which matters will be much worse than in others, and that village inspection will be required at a very early stage of a famine in such parts.

Mr. Jones.—I think the classes referred to in paragraph 31 of Chapter III. should be searched out and relieved in their homes at this stage, as it is likely to save much misery and suffering to the poor and much trouble to those concerned in administering State relief.

Major Baynes.—A register of persons capable of labor or permanently or temporarily incapacitated by infirmity or old age or by tender age from earning their own support should be prepared as soon as there is the slightest indication of the distress assuming a permanent character; in fact such a measure is imperative; if deferred till the necessity for affording gratuitous relief has arisen, the distress can never be properly got under control and all measures for relief will become a mere scramble.

MYSORE.

MYSORE.

Colonel Sankey.—The "Work Committees" would, as observed, furnish lists of the sick and infirm, and be the best agency for dealing with them, on such principles as may commend themselves to Government. They could also be trusted (always, of course, under proper supervision and check) in bringing to notice the real objects for private charity, and the distribution of such aid of this character as may be feasible and advisable with the available means.

Mr. Ricketts.—In the earliest stages of distress I

Ch. II. Qn. 10.

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think no such cases as are here referred to have occurred. Assuming that famine in the Bangalore District commenced in September and regularly set it in in October 1876, the need of village inspection only became absolutely apparent in February and March 1877.

Ch. II. Qn. 11.

Question 11.—Local Charities for Distributing Food.

What local charities exist in your district for distributing food to the people? Are they appropriated to any particular class, or are they available in times of distress for feeding people of all classes? What is their annual value, and how many people are benefited by them? How are they managed? Could they be made more effectual for charitable purposes in times of famine?

Punjab.—6 replies. Various charities are named, but not of great importance or much general use in famine.

North-Western Provinces.—There are few local charities, but the particulars of such as exist are given.

Bengal.—Very few local charities are mentioned, and these are not of great importance.

Bombay.—Answers are to the effect that there are no local charities, except one or two of very trifling importance.

Madras.—8 gentlemen (Europeans) have replied to this question.

The local charitable institutions are limited in number and means. They are said to be incapable of extension, and would not be of any appreciable benefit in affording relief in times of scarcity. Some of them are then obliged to contract their operations, as they are dependent for their resources on the season's crops.

Punjab.

PUNJAB.

Muhammad Hayat Khan.—A list of charitable institutions in which food is distributed to the people of this district is given below. These institutions are, however, not open to all classes of people, only disciples and followers of a certain religion are fed here. The income and expenditure have been approximately given; it is believed that in time of famine no material help can be derived from these institutions. The income is barely sufficient to bear the expenses of the institutions.

List of Places in which people are fed in the Gurdáspur District.

No.	District.	Annual Income.	Annual Expenditure.	No. of Persons fed.
1	Pindori Mahantán	7,000	5,000	2,333
2	Rattar Chattar	3,000	3,000	1,000
3	Dera Nának	4,000	4,000	1,666
4	Dhiánpur	3,000	3,000	1,000
5	Lel	1,000	1,000	333
6	Sum	500	500	200
7	Kot Mián Sáhib	1,000	1,000	333
8	Rám Tirath	500	500	200
9	Gurdáspur	3,000	3,000	1,000
10	Batála	3,000	3,000	1,000
11	Fatahgarh	1,500	1,500	500
12	Tibbi	500	500	200
13	Ghore wáh	2,000	2,000	1,500
14	Kartárpur	1,000	1,000	400
15	Naina Kot	1,000	1,000	400

There is one such institution at Bhárawas connected with a temple in charge of a Bairági. It has an income of Rs. 1,850 a year from maáfi lands, and about Rs. 2,000 from offerings. Fifty or 60 Bairágis are fed every day, but nothing is done towards relieving general distress, nor can any control be exercised over the administration except by inserting conditions in the grants, and if this has already been made in perpetuity, it may not be possible to impose fresh conditions now; but this is a question which the settlement officers may determine.

Mr. Benton.—The *Bhais of* Arnauli and Budláda have established almshouses distributing about Rs. 175 monthly. There are no other local charities. But in times of distress, the municipalities, several of the richer Mahájans in the town, and some of the more prosperous canal villages, distribute alms to a greater or less extent. The monasteries, too (*asthals*), always expend a good deal in charity. I suppose from all these sources some Rs. 1,000 a month may have been distributed during the late distress. There is, as a rule, no restriction as to the class of recipient, save that relief is sometimes confined to travellers, to the exclusion of local paupers. Any attempt at Government interference would probably result in stopping these charities at once.

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Mr. Colvin.—None in the sense of corporate charities.

Mr. Sandys.—There are no organized local charities in this district for the regular distribution of food to the people. There are some revenue free villages, the profits of which have been assigned for the support of temples or shrines, at which at certain times food is distributed mainly to particular classes, but these profits are not available in times of distress for feeding people of all classes. In the towns, a *chittack* or two of flour or of grain and sometimes pice is distributed by the charitably disposed themselves, or by their servants to habitual mendicants, but it is impossible to say what the annual value of such charities is, or how many people are benefited by them, and in proportion as scarcity increases so these charities lessen.

Mr. Whalley.—A few local charities only and those not permanent ones, exist in the district. The principal ones are at Mainpuri maintained by the Rája of Mainpuri and by Dwarka Dás of Farukhabad at Bhongaon. At both these places uncooked food is daily distributed to a certain fixed limit, not exceeding a rupee a day in value at each. The receivers are generally strangers who on their entering into the city resort to those institutions for relief, but when they stop in the city more than a day they get nothing. These institutions are open through the whole year and cost about Rs. 1,200 a year; from 30

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to 40 people are benefited daily by each of the above institutions, and the food is given without any regard to any particular class. None of these institutions are known to have spent more than usual on purposes of relief during the present distress.

Mr. Cornwall.—There are no local charities, unless a small poorhouse maintained by the S. P. G. Mission can be so called. This provides maintenance for about 40 paupers, and there is no room for more. The funds are provided from the Mission.

Mr. Stoker.—The following two local charities exist for giving alms to the poor in the Mirzapur tahsíl only (there are none elsewhere):—

1. At Lohndi, near the city, where there is a temple, tank, and dharmsala. Two and a half pao or ten chittacks of "khichri" (chấwal and dál), some "uplás" (cowdung-cakes) and salt, are given to all poor travellers without distinction of caste.

The trust consists of the interest at 6 per cent. on a sum of Rs. 25,000, and is managed by Bindeshari Parshad, head of the firm of Bholanath Kashinath.

2. At the temple of Mahant Bálkishan Dás in the city. Twelve chittacks of "khichri" are given to all comers without distinction of caste.

Five villages—Korahrá, Bher Patti, and Mahewa, in tappa Chaurási, and Kurkutaha and Kunwar Majhári—are set apart for this purpose, and the entire produce of the sír lands is distributed in charity.

Captain Currie.—The following endowments and charities distribute food to the people:—

(1.) *Hussainabad.*—Rs. 17,000 in pensions, Rs. 2,000 in blankets, Rs. 1,000 food in Ramzan. During cold season 1877–78, Rs. 300 weekly in doles to the blind, crippled, and aged of Lucknow City. Rs. 500 per month to pardanashins.

(2.) *Shah-Najjaff.*—Pays Rs. 1,000 per month in small pensions to Muhammadan wasikadars.

(3.) *City Poor Fund.*—Rs. 1,098–8–4 per month. Gives indoor and out-door relief to all creeds of poor.

(4.) *King's Hospital.*—Annual income Rs. 14,544, expended in medicines and food for sick poor.

(5.) *Martinière Fund.*—Rs. 265–8–0 per month distributed in pensions to native Christians.

(6.) *New Charity Fund.*—Government grant Rs. 15,000, subscriptions Rs. 9,500, distributed in small pensions.

(7.) *Ruddi-muzalim.*—Capital invested Rs. 5,35,000, yielding an income of Rs. 2,400 per annum, spent in semi-religious charity. This is a private trust fund.

For full details, *vide* Junior Secretary to Chief Commissioner's, No. 3,273, dated 19th July 1872. The attempt made by a committee, of which the commissioner was president and which assembled at Lucknow on 28th September 1877, to exercise a certain control over these charities during the present distress, failed owing to the objections raised by the managers.

BENGAL.

BENGAL.

Mr. Kirkwood.—Doubtless local charities for distributing food to the poor exist in many districts, but in only some few of the districts in which I have served can I call to mind any such. I have served in the districts of Hooghly, Cuttack, Bhagalpur, Chittagong, Jessore, Furreedpore, Baukoora, and Moorshedabad. In Hooghly I think there is some such charity from the Mohsin Funds at the Imambara. In Cuttack there is an endowed "Unnochattra," where food is daily, at a fixed hour, distributed to the cripples and beggars of the place, who generally are some 50 in number. In Moorshedabad there is such a charity in the Sen family of Berhampore, another in a wealthy Hindu family of Lalgola, another appertaining to the Paikpara estate, another in the family of Baboo Bijai Gobinda Boral, of Jungipore. These charities dispense uncooked food, together with the fuel necessary for cooking. They are not for any special class, but for all alike. The charity appertaining to the Sen family has an annual income of about Rs. 6,000, and about 30 persons daily partake of the food distributed; the income of the others is not known. Also in the Moorshedabad district, the Maharani Surnomoye, C.I.E., with a regularity which has extended over many years, daily bestows at her family residence about half a pound of uncooked rice to about 2,500 poor persons. There is no doubt that in this latter case the selection of the recipients might, with advantage to the employers of labour and to the recipients themselves, be more carefully made. Besides this, on every *dwadasi*, or the twelfth day of the dark half of the month, the same lady distributes an allowance of one pound of uncooked rice to about 4,000 persons.

BOMBAY.

BOMBAY.

Mr. Spry, Kaladgi.—There are no permanent local charities in this district for distributing food to the people. The temporary local charities I have already described in my reply to question 9.

Mr. Propert, Khandesh.—There are none worth mentioning in the district. A small fund exists in the town of Dhulia, to which the public and municipality subscribe, but this amount is very trifling, and the object of the fund is to assist the poor in obtaining education rather than the supply of food.

Mr. Ramsay, Nasik. — There is no organized charity in this district that I am aware of, save a poorhouse kept by the Missionary Colony at Sharanpur, near Nasick. It is on a very small scale.

Mr. Norman, Poona.—The only charitable institution in this district is the David Sassoon Infirm Asylum at Poona. It affords relief to the infirm, cripples, &c., in boarding and clothing. The average number of persons aided is about 71. The annual income amounts to about Rs. 3,060, made up of endowments and subscriptions.

Mr. Hamilton, Ahmednagar.—There are no local charities; during the famine a few wealthy *Banias* made presents of grain for distribution to the infirm poor of their villages, but refused to have anything to do with its distribution, which was entrusted to the village officers.

Mr. Bosanquet, Belgaum.—So far as I am aware, charity is given by individuals only, there being no societies or associations for distributing it. The people receiving it are for the most part religious mendicants. Here at Belgaum a certain number of lepers are maintained by the Roman Catholic chaplain from private contributions, and the London Mission from a similar source gives some relief to distressed poor. These

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BOMBAY.

institutions, if such I may call them, are insignificant when the size of the district and its population are considered. I am not aware, however, of the existence of any other institutions of the kind. In time of famine these little institutions might do more if further assisted, but it would not be much. I am told that the native pastor of the London Mission Society at Bail Hongal, a few miles from here, organized a local relief establishment, to which the native community contributed, and that he received and provided for a few orphan children.

Mr. Moore, Satara.—The only local charity that exists in this district for distributing grain to the people is the Frere *Unnachatra* at Satara. The charity is confined to the lame, cripples, blind, and other like deserving objects, three times a week. Its annual expenditure is about Rs. 370, and about 75 people are benefited by it. The *Chatra* is managed by a committee. I do not think that it can be made more effectual for charitable purposes in times of famine, owing to its limited funds.

MADRAS.

MADRAS.

Mr. Pennington, Tinnevelly.—I annex a statement showing in abstract the number of chattrams in the district with their income and the classes of people who benefit by them. The numbers of those who probably benefited by them can best be estimated from their income. Eight of them are managed by the local fund board and the rest are in charge of private individuals. No doubt the funds might be spent to greater advantage under a better system than prevails in the management of most charitable institutions :—

Class.	Number of Chattrams.	Annual Income.			Number of Men fed.
		RS.	A.	P.	
First - -	4	13,241	0	0	All comers are fed daily.
Second - -	4	4,094	0	2	All Brahmins are fed and conjee to poor daily.
Third - -	12	8,282	10	1	All Brahmins are fed daily.
Fourth -	5	1,520	13	8	Batta, conjee, &c., miscellaneous charity.
Fifth - -	81	31,557	2	4	457 Brahmins fed daily.
Sixth - -	7	704	0	0	53 Brahmins fed occasionally.
Total -	113	59,399	10	3	510
Of this under local fund board -	8	10,567	14	0	
Private - -	105	48,831	12	3	

Mr. Whiteside.—In North Arcot there are very few local charitable institutions. At Vellore and at Arcot there are lungerkhanas which are supported from endowments, the remains of charity of former native rulers of the country. These endowments are very small, and from them a small daily dole of grain is given to a limited number of beggars. The recipients of the dole are chosen irrespective of caste, and are usually deformed persons, cripples from age or infirmity, lepers, blind, &c. There is also the Annadana Chattram at Sholinghur, which from the income of its endowments, provides meals of cooked rice for pilgrims going to and from the temple of Sholinghur Hill. The funds of this institution are not available for feeding persons in times of distress, and this is also the case as regards the fourth and last charity in this district. This is Cunniah Chetty's Choultry at Vadamalpet, in the Karvetnagar Zemindari, wherein a limited number of *bonâ fide* travellers receive a daily dole of food.

The lungerkhana at Vellore is managed by the municipality; a special sub-committee of the commissioners superintend the issue of the dole and give away tickets to fresh applicants as vacancies occur. The income is only Rupees 3,828 per annum, and the number of persons anxious to participate in the dole is always far in excess of its capability. During the famine, in order that more might obtain some small relief, the daily dole of rice was reduced by one-half, and this was also done at Arcot where the lungerkhana is managed by the tahsildar for the time being under the orders of the sub-collector. The income of this institution is Rupees 1,320 per annum. The limited nature of their income and the fact that the recipients of the relief are selected from the very poorest and those most in need of charity whose numbers always far exceed the powers of the charity, prevent any appliance of the funds to charitable purposes in times of distress.

Mr. Grose, Nellore.—The only local organised charity is the Nellore Lungerkhana, the chief work of which is to give cooked food to selected paupers. Its income is Rupees 2,940 per annum. It can only assist in famine operations by becoming the nucleus of a poorhouse, and even that is undesirable.

Mr. J. G. Horsfall, Kistna.—There are about a dozen local institutions at which food is distributed to a limited number and to particular classes. They are unimportant and could not be made available for feeding people of all classes. At the most important one only twelve Brahmins are fed daily ; at the others still less. I do not think that they could be utilized in any way.

Mr. McC. Webster.—The lungerkhana at Coimbatore is the only charitable institution in the district which has any organized system. It is managed by the municipal commissioners, and the ordinary income of Rupees 1,200 is devoted to feeding about fifty poor people. It is not capable of extension, and would not be of any appreciable benefit in a time of famine.

Mr. Sewell, Trichinopoly. — We have one local fund chattram at which there is a very small allowance for feeding travellers daily. This amount was slightly enhanced during the famine. In Srirangam chiefly and in a few of the larger towns there are chattrams endowed or kept up by private individuals at which Brahmins first of all and then a few Sudras are fed daily. The total number of these institutions is said to be 182, and the average daily number of persons fed, 334. I do not think that in times of famine their usefulness can be extended. On the contrary, at such times their means are generally crippled and the distribution of food curtailed.

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MADRAS.

Mr. Stokes, Madura.—There are seventy-six chattrams in the district designed for the distribution of food to the people. They feed all but very low classes, such as Pariahs, Pullars, Shanars, &c. They are not able to meet the demands on them in famine times as they depend for their resources on crops, and therefore suffer from a failure. They were generally intended for the benefit of the pilgrims to Rameswaram and other places, and cannot, therefore, be made more effectual for charitable purposes in times of famine.

MYSORE.

MYSORE.

Mr. Ricketts.—As now constituted, and with their limited incomes, these charities could hardly prove effectual in times of famine. The principles on which the chattrams exist appear to me to be radically unsound. They encourage a set of paupers, many of whom almost subsist entirely by wandering from chattram to chattram to get their meals. I would abolish them all, and in lieu endow with the funds one large institution to be well managed at the pettah of Bangalore.

QUESTION 12.—INDICATIONS OF SCARCITY HAVING BEEN UNDER-RATED.

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It is assumed in question 6 that the district officer believes the distress to be temporary, or is not satisfied that it is indicative of approaching famine. But it is possible that he may be mistaken in his appreciation of the facts he at first observed. What indications would lead him to conclude that he had been mistaken and that famine is imminent? What steps should he take to have any such indications brought to his notice? The most obvious points would be such as these: To obtain the best information as to the character and progress of the crops on the ground; as to the prices and the kind of grain exposed for sale in the markets; as to the fullness of stocks in the market and the quarter whence they come; as to police returns of lawlessness and crime; mortuary returns of deaths; reports of deaths by starvation in villages, and more especially roadside deaths; emigration or movements of the people in any direction; sales of ornaments and jewels. Are there any other such indications, and in what way should he secure that such facts should be immediately brought to his notice?

Punjab.—5 replies. Besides the indications mentioned, great activity of local officers in the way of reports and visits is recommended.

North-Western Provinces.—22 answers are given. The points stated in this question are the principal indications of imminent famine.

Bengal.—14 answers. The indications in this question are thought sufficient. Information should be obtained by officers moving about.

Bombay.—7 answers are offered. If the symptoms continue, or if prices continue to rise, crime increases, then expected rain does not fall, and the periodical returns of the people's health become more unfavourable, the district officer would infer that famine is imminent.

Madras.—12 European and 2 Native gentlemen have replied to this question.

Assuming that a district officer may not in the early stage of distress have fully appreciated the gravity of the situation and the imminence of famine, the further indications which would lead him to modify his opinion would be the increased sale and mortality of cattle, the sale and desertion of children by their parents, the receipt into the treasuries of old uncurrent coins, showing that the family hoard had been trenched upon, the flocking into towns of large numbers of emaciated persons, the desertion of villages, the deficient supply of the markets, the fact that the doors and timbers of houses are there brought for sale, the increasing demand for employment, wandering of the people in search of food, and the relaxation of caste prejudices. It seems unnecessary to point out any particular way in which he should secure such facts being brought to his notice, as they are patent to everyone.

PUNJAB.

PUNJAB.

Colonel Parsons.—The indications of approaching famine are sufficiently fully set forth in the paragraph containing question 12. (*b.*)—With a view to the early receipt of information on all necessary points, village watchmen, police, and *tahsil* officials, might be required to furnish immediate reports of personal signs of distress; the reports to be in accordance with authoritative instructions for universal adoption in districts, instead of in a desultory and irresponsible manner. *Naib-Tahsildárs*, many of whom have no judicial or magisterial work, might be required to make periodical tours within the limits of their *tahsils*, and furnish written reports in prescribed form embracing all necessary particulars.

Mr. Roberts.—Existing agencies, such as village *Chaukidárs*, *Zaildárs*, and police and *tahsil* establishments, are sufficient for securing accurate and early information on all the points noted, except sales of ornaments and jewels, and stocks of food grains on hand, and these are not easy to ascertain, as pawnbrokers and grain dealers consider secrecy essential to the success of their dealings, and are always jealous of an inquiry.

In districts where trade is active, from all parts of which a railway is accessible, the quantity of grain in store will always depend very much on the prices ruling in other parts of India, and the course of traffic in grain will always be a good index of the condition of the district. So large a proportion of the cultivated area also is dependent on rain, that a general idea of the quality of any coming harvest may always be formed by watching the rain-fall.

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NORTH-WESTERN PROVINCES AND OUDH.

NORTH-WESTERN PROVINCES AND OUDH.

Mr. Sells.—I am not aware of any indication of grave distress portending famine beyond those noted in this question, setting aside the condition of prices and scantiness of supplies in the markets, I should hold emigration to be the surest sign of actual famine. The increase of crime would be another of the most important indications. Reports of deaths of actual residents of the villages would show severe destitution, but they would give no information as to the distress being merely temporary or not; and it will often be the case, I apprehend, that actual starvation has not been the cause of death, but rather disease or exposure acting upon an emaciated body. Roadside deaths will not necessarily tell anything as to the extent of distress in the districts itself; as often as not the people dying will be beggars from other districts. Extensive sale of ornaments certainly tells of very severe pressure, which, however, still may only be temporary. This last indication is one that is not readily secured, and I am not prepared to say how the district officer is to ascertain such increase of sale, except *vaguely*, and by *general* report received from the various officials in the district. A fair general impression may, however, be gained. The other points are more readily ascertained. The village *chaukidars*, headmen and patwaris should be required to bring to the attention of the *tahsili* and police officers any such facts, and intimation of them should, by the latter, be promptly brought to the notice of the district officer.

Mr. A. Colvin.—The last part of this paragraph mostly answers the first. The further indication by which I should judge would be the prospects of the food crops in other parts of the province, and the growing pressure of the local demand for employment.

Mr. Sandys.—A steady rise in the already high prices, increased demand for employment, knowledge that the crops had failed and that the prospects of the future crops were bad, numerous applications against the grain dealers for refusal to make their ordinary advance of food, constant complaints that the villagers had refused to allow of the export of any grain from their villages, would indicate that famine was imminent.

BENGAL.

BENGAL.

Mr. Barlow.—The list of indications of approaching famine given in this question appears correct and complete. I cannot add to it. I can only say, thinking of my own experience, that I should deem any officer fortunate who, face to face with the uncertain conditions of distress and famine, has early in the day a reasonable number of these clear indications set before him upon fair and reliable information. He should be able to decide what the prospects really are promptly and without misgiving, and take measures accordingly.

I think, however, that the most important view connected with this branch of the subject is the following, viz.: How is the district officer to judge between temporary distress and famine in the actual absence of, or when he is unaware of, the existence of such symptoms as those described? The Orissa famine was a real calamity beyond dispute, and the indications almost certainly must have been present. Yet they were not known to officers most anxious to discern them. Such failure must be attributed to defective information, and its recurrence is only more or less capable of being guarded against. New difficulties, however, meet us in the way. In 1873-74 the determination of the policy to be adopted was arrived at so early that there was not time for the appearance of some of the most important indications noted. There was of course a reason for this haste connected with the important question of grain importation, but the effect was the same, that the complexion of the famine had to be determined before the symptoms were fully developed. So, again, the definite instructions that relief shall be given to the people in an organized form before they are reduced to a generally deteriorated state, tend to throw back, if they may not altogether obliterate, the appearance of these real famine indications. Really effective relief, administered according to the conditions contemplated in questions 6 to 9, might keep off any great increase of crime or death, and might check emigration and the sales of property, &c. In this manner an officer dealing with distress as temporary might advance far into real famine without warning. The whole subject of indications and the use to be made of them hangs greatly upon the policy which Government may determine to follow in connection with distress and famine. If it decides that, regardless of expense, not a life is to be lost that could be saved " by forethought and management," then the appearance of these indications of real famine cannot always be waited for, and extensive preparations must be made which may afterwards prove not to have been needed.

On the other hand, if indications may be waited for, a certain amount of loss of life is unavoidable.

I cannot suggest any special measures for bringing facts and indications before the district officer. All know the value of ascertaining these, and will ascertain them to the best of their ability, if action is not forced upon them in too hurried a manner. Agency is the difficulty here again. Native report, especially if the idea of relief gets abroad, is simply confusing and misleading.

Mr. Worsley.—The only other indications of imminent famine would be (1), a deterioration in the physique of the people; (2), increased applications for employment on works *at the ordinary rates*; (3), the continuance of drought. By requiring the officers in charge of sub-divisions, thanas, and works to submit weekly reports, and by constantly moving about his district, the district officer would be kept regularly informed of all matters that could throw any light on the extent or character of distress.

Mr. Magrath.—As I have already stated, it is of course possible that any forecast may be upset in a hundred ways. The mere cessation of the rains a fortnight earlier than usual may and has converted a scarcity into a famine.

It is impossible to say what would first lead him to know that famine was imminent, but any man who knows his district would see it in a hundred ways. The character and prospects of the crops on the ground he would, as I have shown, know; the kind of grain for sale the district officer would partially know, but the prices would be often difficult to ascertain in places where there are next to no markets and no traders; the whole work of carrying away the surplus produce being done by foreign beparis. As to stocks, under the circumstances I have mentioned, the district officer could only find out what came into the towns and very large villages, but the great point—what surplus stocks are in the hands of the cultivators—he would not know and they will not tell. Returns of grain thefts are very illusory. In the Mudhubanni Sub-division, where the famine was worst, there was little crime, whereas in the north of Bhagulpore adjoining, where there was but little famine comparatively, robberies and thefts were plentiful. Mortuary returns are apt to be very illusory in famine time.

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Bengal.

Deaths of starvation in villages are never reported as long as the zemindar can keep them quiet, for fear of his being called upon to support the poor. Roadside deaths are an indication generally, but their absence is no proof of the absence of starvation, nor does their presence show that the starvation is the result of famine in the locality where the corpses are found. In the famine of 1866, long before there was any scarcity in the Burdwan District, corpses were daily to be seen by the roadside of people who had straggled up from Midnapore. The people do not generally begin to emigrate or move in large bands until there is no food obtainable. When food begins to fail they straggle off in small parties in search of work, knowing that a few are more likely to pick up a living than many. "Sales of ornament or jewels," this should have read "pledging or pawning," as the jewels are very seldom sold out. This is illusory as a test, as such pledging takes place in any bad year, in order to get advances to carry the family on; but a sure test is the sale of the brass vessels, which are always the last thing parted with. Besides this, as I have already stated, distress amongst the weavers, lac ornament makers, and village carpenters, and the like, is a certain indication of such failure of the crops as to make famine, not scarcity, certain. The facts are certain to come to notice through the police and the other officers moving about. There has been no case in which the local authorities have been unaware of the prospect of famine that I am aware of.

Mr. Hodgkinson.—The most certain indications of distress ripening into a famine would be—

(1.)—Scanty and ill-distributed falls of rain at agricultural periods.

(2.)—Concurrent rise of prices in the district and districts from which it imports.

(3.)—Large accession of numbers to the relief works already opened.

Provided that only ordinary wages are given, I regard the last as a very good test indeed of the necessity of an extension of relief operations not only in the direction of opening more works, but in providing more poorhouses when there is no immediate prospect of relief by a supply of field labour, or of food, and eventually if prospects do not improve of organizing village relief. If persons come to labour for a wage which in famine times barely suffices for their own subsistence, it is evident that the weak and infirm of their families cannot be provided for by them. With regard to the points mentioned in the question, I note briefly the extent to which information in regard to them is obtainable with the existing district organization.

(1.) *Information as to Character and Progress of the Crops on the Ground.*—In a general way this information is readily obtainable from official as well as from non-official sources.

(2.) *Prices and kind of Grain exposed for Sale in the Markets.*—Information on this point is usually supplied for the larger markets at least. There would be no difficulty in obtaining it also for the smaller hâts which are held once or twice in a week, and are the real markets of the country people. A comparison between the prices ruling at the large bazaars and those at the hâts would be most suggestive at critical times.

(3.) *Fullness of Stocks in the Market and the Quarter from which they come.*—Our information in regard to stocks is lamentably deficient. I have already made suggestions in this matter (question 1). In regard to the larger markets we have some information as to the direction from which supplies are received, but at a slight expense it may be very much increased.

(4.) *Police Returns of Lawlessness and Crime.*—These are of course available.

(5.) *Mortuary Returns of Deaths.*—In this district so little progress has been made in obtaining correct statistics that at present only the most fallacious conclusion would be derived from them.

(6.) *Reports of Deaths by Starvation in the Villages and more especially Roadside Deaths.*—Roadside deaths would be almost invariably reported; of deaths by starvation in villages I am not certain that correct reports would be made.

(7.) *Emigration or Movements of the People in any Direction.*—Emigration for a time to East Bengal goes on annually. Local inquiries by Government officers from landholders and others will generally show whether in any year there are more emigrants than usual. In the past year the number of emigrants from Sarun has been unprecedented. They go in October, November, December, and return in May and June.

(8.) *Sales of Ornaments and Jewels.*—On this point we have at present no means of information beyond general rumour.

BOMBAY.

Bomba

Mr. Spry.—The indications which would lead a district officer to suppose that he was mistaken in the temporary nature of the distress would be,—

(*a.*) The failure of the rainfall at the time expected, for instance, if the distress began in April, and the south-west monsoon did not bring the usual amount of rain in June.

(*b.*) The continually increasing demand for relief.

(*c.*) The prices of grain rising.

(*d.*) The increase in crime, such as grain riots, dacoities, robberies, thefts, &c.

On these points, and the others noted in the question under reply, he would keep himself informed by daily reports from his subordinates in all parts of the district.

He would also ascertain the prospects and present condition of surrounding districts, and form his opinion thereby.

Mr. Propert.—The ordinary district and village system of administration in the regulation portions of the Bombay Presidency fully ensures every point of interest regarding famines and other unusual occurrences being brought to the notice of the district officials. The indications enumerated in the question embrace, I think, all points likely to arise in connection with an impending or existing state of famine.

Mr. Ramsay.—As I have already stated above, I do not see how a district officer of ordinary intelligence and vigilance could make such a mistake. As an instance, I am now in receipt of daily reports from each taluka in my district. Everything bearing on the condition of the people is reported to me. I do not believe a single death, save from pure natural causes, could occur without my knowing it within 48 hours at latest. I cannot say more than this. I instituted these daily reports because the prospects of the rainy season at first were unfavourable.

Mr. Norman.—In my opinion it is impossible that a district officer can be mistaken as to whether distress is likely to be permanent or temporary. If the early rains alone fail, it may be only temporary, but if the later rains also fail, the distress must continue until next harvest. The collector of a district is always in possession of every possible information regarding the state of his charge, and he should have no difficulty in drawing his own conclusions.

Mr. Bosanquet.—I presume that the continuance of the causes which led the district officer to appreciate the first appearance of distress, although he might think it to be temporary only, would satisfy him that

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BOMBAY.

he was mistaken in his first impression, and that famine was really imminent. Those circumstances might be continued drought, or the failure of the late crops as well as of the first, the continued demand for labour by persons in distress, and the increasing number of persons demanding charitable relief. These things would come to his notice in ordinary course, and would not require any special steps to be taken in order to his becoming acquainted with them. Information regarding the crops, regarding the prices of grain in the markets, and regarding crimes and offences are brought to his notice as a matter of course in all times. Information regarding the other points noted, could of course be demanded. Such information was periodically obtained here during the continuance of the famine. Information on all these points would be that most required, and it does not occur to me to suggest any other.

Mr. Moore.—I can add nothing to what I have written above. If the reports showed me, and if I observed that distress was becoming general, I should organize strict village circle and house-to-house inspection, and thus secure that all facts should be immediately brought to my notice.

Mr. Robertson.—It is assumed only in the first two and a half lines of question 6 that the district officer believes the distress to be temporary. Question 6 then branches off into other points, leaving aside the above assumption. As noted by me in answering other questions, the regular returns the district officer receives of the rain-fall, condition of crops, and health of the people and their condition, will not for a moment allow him to be unaware whether famine is imminent or not.

I have no reliance on any information obtained as to stocks in the market. The returns of the state of crime are weekly placed before the collector and magistrate, and by him sent on to the commissioner. Emigration during the cultivating season is a sure sign of approaching or much apprehended distress. Sales of ornaments and jewels do not take place till the pressure of a famine is unmistakably severe. Deaths from starvation in villages or roadside deaths cannot be considered as indications that a famine is imminent. We ought to and should know the state of the country long before these could happen. Such deaths would be signs that there was either some fault in our famine arrangements, or prove that some one had to be taken to task for neglect.

MADRAS.

MADRAS.

Sir W. Robinson.—On the assumption of this question the district officer had better be removed—such was the experience of Madras administration—because while he is blundering the people are dying and irremediable confusion is arising.

Mr. Whiteside.—The various points specified in this question may all be regarded as indications of impending distress, and should be quite sufficient to put an officer on his guard. There is one fact that I noticed in connection with this famine, which I regarded as a sign that the distress had reached persons not of the poorest class, and that was the receipt in the treasuries of ancient uncurrent silver coins in considerable numbers. Many of these coins were quite clean and bright. They had evidently been hoarded carefully and had hardly, if at all, been in circulation. The parting with these little treasures must only have been decided on when distress was being keenly felt by the owners. For there was nothing so marked throughout the famine as this propensity of the natives to save money by hook or by crook. Even paupers who died in the camps from emaciation, or the other ailments induced by continued privation, were very often found to have rupees concealed on their persons. This was the case amongst the very poorest of the people. The hoarding of ancient coins is a weakness of natives of the higher classes, and the voluntary surrender of what they undoubtedly had kept stored away for many years must only have been made when they were sorely pinched for ways and means of existence.

Mr. J. G. Horsfall.—Clause II.—The weekly reports already referred to above—Question I.—checked by personal inspection should afford him immediate and ample notice.

The sale and mortality of cattle as well as of men, difficulty experienced in collecting the usual kists, desertion or sale of children, increase in number of persons asking for food, and the flocking into towns and villages of bodies of emaciated people, are all indications which should be noticed in the weekly reports.

Mr. Price.—The indications named, with the addition of continued falling off in the condition of the people of the district, and increased applications on their part for work and relief, are those which ought to very soon show a district officer his mistake. The obvious means for securing this information are to move about himself, keep his officers moving and sending in weekly reports, and where things are said to be in a bad state, going to see for himself. No system of reports will ever give the information to be gained by keeping on the move.

Mr. Grose.—I believe the points enumerated in the question are the chief points to which the district officer's attention should be directed; but, as I have said, village inspection should be organised at an early stage.

Mr. Lee-Warner.—In nearly all parts of this presidency there are established weekly fairs so arranged that in turn at one centre or another of every ten miles within the district there is a weekly market almost every day of the week. These weekly markets afford very valuable indications of the progress of distress at this stage, as not only do the inhabitants of all the neighbouring villages come together of their own free will and much can be learned from their appearance and the cloths the women wear, the latter wearing their best at these meetings; but there is also an opportunity of judging from the articles brought in for sale, other than grain and cattle, such as doors, door-posts, old thatching, &c., and the prices which such articles fetch, how deep the distress has penetrated into the homes of the poor. While I was on famine duty, I never neglected the chance of pitching my camp near the place of such meetings, and during their course I always mixed in the crowd to observe these indications myself. It takes a good deal of driving to make a Revenue native official see the uses of this sort of inspection.

Mr. Austin.—I do not think it possible for a divisional officer to mistake the signs of approaching famine. Continuous drought accompanied by mortality among cattle, a steady rise in the prices of food grains, reports of desertion of small ryots and coolies from certain villages, increase of crime, in larger towns rumours of grain riots, increase of deaths: all these are facts that must come to the notice of a divisional officer, and from which he may easily predict with tolerable certainty the chances for and against a famine year. With regard to the actual state of the country a divisional officer must learn this by steady touring through his taluks. The village officers are always ready to give information, although at the same time

Ch. II. Qn. 12.

Madras.

they are naturally prone to exaggerate. It is, of course, to the interests of the people to make matters out worse than they really are, and their representations must, therefore, be taken *cum grano*. A little care in sifting their statements will, however, generally enable a divisional officer to form a pretty accurate estimate of the real state of affairs.

Mr. Weekes.—The greatest and most certain indications of all, and which should at all times be carefully looked for, are emaciation, recourse to wild berries, leaves and roots, wandering in search of a better land (like the sons of Jacob going down into Egypt because *they heard* that there was corn in Egypt).

MYSORE.

Mysore.

Mr. Ricketts.—A district officer would very soon find out his error if he made the mistake of confounding temporary distress with imminent famine. Most of the indications which would lead to the conclusion of impending famine are clearly given in the present question. A few more might be added, such as selling straw, the mainstay of an agriculturist as regards his cattle, at extremely cheap rates. Fowls selling for a mere song. Ditto cattle and sheep. Mutton and beef going down to half its usual price, and so on. People sell at these cheap prices virtually in order to save life, though of course after a time there is a reaction; prices go up again, and reaching their former level, recuperate themselves by, say, going up an extra 50 per cent. where they had previously gone down 50 per cent. Less consumption of toddy and arrack also takes place, and lastly the sufferers crowd round the district officer in his tours and tell him their wants and fears. There can be no mistaking what their terrified look, voice, and even tears indicate. All the above the district officer can easily learn from his office accounts and personal observation. Amildars, too, at such a crisis are not backward in writing full reports of the state of their taluks, and giving expression to their own views. Lastly, the district officer and his assistants at this time go touring, and from his own observations and the demi-official communications of his assistants, the district officer gets early and accurate information on all necessary points.

QUESTION 13.—INDICATIONS OF DISTRESS HAVING BEEN OVER-RATED.

Ch. II. Qn. 13.

On the other hand, the distress which the district officer has held to be serious, though temporary, may turn out to be so slight as to require no special measures of relief. What are the indications which would lead to the conclusion that this is the case: and what steps should he take when he comes to that conclusion? Are any precautions requisite to guard against an erroneous estimate of the necessity for offering relief other than those which are supplied by the application of suitable labour or other tests?

Punjab.—4 answers. Opinions as above.

North-Western Provinces.—19 officers answered. The opinions are the same as those offered by the Bombay officers.

Bengal.—12 answers. The opinions are generally the same as those above.

Bombay.—7 officers answered this question. The passing away of distress will be shown by the people leaving the works and ceasing to apply for relief. They will go off the works themselves when the prospect brightens.

Madras.—10 European and 1 Native gentleman have replied to this question.

A district officer is far more likely to be led into a mistake of this sort than into one of the nature indicated in the previous question. When rain and prices fall, and people begin to leave the poorhouses and relief works, and agricultural operations are resumed, matters are on the mend. A strict enforcement of the labour and wage test will generally suffice to prevent abuse.

Mr. Weekes points out an important distinction between the indifference of people to employment when they are in fair condition, and prospects are improving, and the same indifference when they are feeble and emaciated from famine.

PUNJAB.

Punjab.

Mr. Roberts.—Under the circumstances described, relief works, if started, should be closed, and gratuitous distributions of food should cease. If care be taken not to make the works too attractive, and to give only a bare subsistence allowance in poorhouses, and to exact even from the old and infirm such light labour as they may be capable of, the people will not be slow to abandon the works, and leave the poorhouses as soon as easier times admit of their getting a living otherwise. When this occurs, and petty offences against property diminish, and emigrants begin to return to their houses, it may fairly be assumed that the distress, which seemed likely to be serious, is disappearing.

NORTH-WESTERN PROVINCES AND OUDH.

North-Western Provinces and Oudh.

Mr. Sells.—Steady prices, improving weather prospects, the promise of some portion of the harvest being secured, may be accepted as signs that distress, unless influenced by causes working outside the district, such a great demand for food grains in other parts of the country, will be but temporary. The utility of smaller "test" works are here useful, as showing how far there is actually a demand for work, and how far "special" works on a large scale may be necessary. It may be taken as an axiom that wherever severe distress exists

II. Qn. 13.

NORTH-WESTERN PROVINCES ND OUDH.

there will be a demand for work, and relief works will attract even at subsistence wages, and I am not aware of any other good test than this.

Mr. Colvin.—They are not very easy to decide. The reverse of the unfavourable symptoms noted in the last question would be the most obvious indications. An unwillingness to remain on the works at a low but sufficient rate would be a good sign that pressure was not serious; and if the food supply elsewhere promised well that pressure would soon pass away altogether.

Mr. Sandys.—Such a misapprehension is not likely to arise, unless a sudden improvement in the prospects of the ensuing harvest were to occur in consequence of an unexpected fall of rain. Under these circumstances, if the wages given at relief works were in reality a mere subsistence wage, the applicants for employment would rapidly leave the works; and if the rule as to residence in the poorhouse were strictly enforced, the paupers there would be almost as anxious to return to their homes as the labourers. It would then be time to close all relief works and to keep up the poorhouse only as long as the numbers there were not more numerous than would come in an ordinary year, and the prices of food remained so high as to render their death from starvation probable if they were at once to be discharged.

Mr. Tracy.—If the district officer has held the distress to be serious he will have made provision for relief works and poorhouses. If he finds that the people will not come to these, or if, having come, they desert them, he can have no better assurance that no real distress exists. The only satisfactory test of distress which I know of is the experimental one of opening works at bare subsistence rates.

Mr. Cornwall.—The reverse conditions to those specified in the answer to question 12 will apply here. The people do not seem to care to remain on a relief work when there is any prospect of being able to subsist at their usual employment. When the district officer is satisfied that there is no serious distress, he should reduce the amount of wages paid for each task, which will probably have the effect of sending to their houses all who can obtain a subsistence on as easy terms. The plan was tried last year on the Mogal road and approved by Government, and shortly afterwards it became obvious from a simple inquiry into the place of abode of the remainder that nobody thought it worth while to come to the work who could not return to his comfortable home at night, and the work was then stopped. The labour and other tests usually applied seem to afford sufficient precautions.

BENGAL.

BENGAL.

Mr. Barlow.—With relief under anything like control there should be no real difficulty in deciding when special measures may be put a stop to. If numbers do not increase, or in face of the tests, people refuse relief and go away; if the general tone and appearance of affairs does not get worse or even improves, it will soon be known that relief is not required to be continued. In practice small relief works have been constantly opened, and no difficulty has been experienced in closing them. All except professional beggars gladly go away when their necessity ceases; and for the beggars, it is sufficient, as soon as things seem to have resumed their normal condition, to close the relief places, and they disappear.

Mr. Worsley.—The indications which would lead the district officers to the conclusion that he had over-estimated the character of the distress would be (1), steady falls in prices caused by importations of grain; (2), desertion of ordinary or special works; (3), the fall of seasonable rain, enabling the people to resume their ordinary agricultural operations. On coming to such a conclusion the district officer should diminish the number of works.

Mr. Magrath.—I have no experience of distress turning out less than it was expected, nor should I suspect that the indications of such an occurrence would have any great effect upon anyone who predicted a famine when only a slight scarcity would occur.

Of course there are occasions when the district officer has to report (as happened in August and September 1874) that any further break in the rains would cause a total failure of the coming crop, and when his prediction of total failure would be falsified, as it was then, by the rainfall on the 15th of September. But in all cases of this kind it is necessary to have a margin, and nothing could be more foolish than to find fault with an officer's estimate of his requirements, because at the close of relief he may have 10 per cent. or so of his grain still in hand. The ordinary tests are to my mind quite sufficient to send the people off the works.

BOMBAY.

BOMBAY.

Mr. Spry.—The indications which would lead a district officer to conclude that he had been mistaken in his anticipations of serious, though temporary distress, would be a diminution in the numbers applying for relief on works or otherwise, and by those already on relief going off. The works might then be thrown open to all comers, and then if the numbers did not increase, or only increased by the coming on of people such as *wadars* who usually gain their living by labouring on public works, it might be reasonably concluded that the necessity of works, as relief works, had passed. The works might then be carried on as ordinary ones, or gradually closed by concentrating people from several works on to one or more. I am not aware of any precautions requisite beyond those of suitable labour and other tests.

Mr. Charles.—The lowness of wages and the distance test are all that is necessary to drive away persons not in need of relief; if these are strictly enforced, the district officer will very soon find out, by all his labourers leaving the works, that the distress requires no special measures of relief. No other tests seem necessary.

Mr. Propert.—A district officer must, as I have repeatedly stated, act according to circumstances. No man of experience would start works or measures of relief until he had satisfied himself that real need for the same existed; according to the Bombay Regulation System, a collector of a district daily corresponds with subordinates in every portion of his charge. The very best information is therefore available at any moment. This and many other questions do not seem applicable to the Bombay Presidency. If real distress, temporary or permanent, be observed, small works affording a bare subsistence only should be opened. If distress cease, the labourers will most assuredly quit such works at the earliest possible opportunity. If gratuitous relief has been established, a mere glance at the market rates of food will enable an officer to say whether such relief should or should not be discontinued. Where such relief is first discontinued a few complaints may possibly arise, but these disappear

Bombay.

very quickly and things resume their normal condition. I cannot think it probable that in the Bombay Presidency any difficulties such as those hinted at in this question are likely to arise.

Mr. Norman.—I do not think the difficulty referred to in this question is ever likely to occur. It has been found that people leave relief works as soon as they have a chance of supporting themselves at their own homes. It is more difficult to clear the poorhouses, which are crowded with infirms and cripples, but they also show but little inclination to stay if they have an opportunity of returning to their homes.

Mr. Bosanquet.—On the distress diminishing the district officer could not help becoming aware of the fact, as I know from my own experience. The demand for labour and for gratuitous relief diminishes, the prices of necessaries of life go down, and cheerfulness takes the place of despondency among the community.

Mr. Moore.—If I found from the reports of my Mamlatdars, chief constables, general duty *harkuns*, schoolmasters, and sub-registrars, who would be warned to keep their eyes open, that there were no cases of actual distress in villages, and that people when advised to go on works and earn wages declined to do so; if I found that people did not wander and that beggars did not increase and that prices did not rise, then I should consider that no special measures of relief were necessary.

I can suggest no other precautions than strict orders to all my subordinates to be most careful to guard against enormous estimates of the necessity for offering relief.

Mr. Robertson.—If happily by the blessing of Providence, after distress has appeared to be serious, rain falls, and the danger is averted, our weather reports and the reports on the condition of the people and the progress of agricultural operations enable the district officer to see that distress is averted. Works that are open will without pressure be deserted by those who desire to go to their fields. Thus numbers on relief labour will decrease. Gradually, as the prospect becomes better, the stronger may be sent from the relief camps to their homes, but all this time vigilant circle or village-to-village inspection must be maintained. When the registers show that there are very few requiring relief, then the villagers and townspeople may be called upon to support their own poor according to old custom.

MADRAS.

Madras.

Mr. J. G. Horsfall.—A good fall of rain, the commencement generally of agricultural operations accompanied by a fall in prices and the desertion of relief works by the people and their return to their own villages would sufficiently indicate the non-necessity of continuing relief operations which should be closed.

Clause II. — A special commissioner might be deputed to visit the district and ascertain, by personal inspection and inquiry, that the views of the district officer were not exaggerated.

Mr. Whiteside.—When famine works have been opened by Civil Agency, and the gangs do not fill; when the people who have no work to do in the fields will not accept the aid offered by the State either on the works or in relief camps, but prefer to loaf about and beg, the district officers may safely conclude that distress is not severe or likely to be permanent. By the careful application of the distance, labour, and wage tests, I consider that a district officer can guard himself completely from an erroneous calculation of the necessity for relief, and I would suggest no others.

Mr. Price.—The first indication after those afforded by the weather would be the people quitting works, unwillingness to go to poorhouses and anxiety to get out of them, a fall in prices, and an improvement in condition of the masses. The people will seek and remain on village relief long after any necessity for it exists. There are persons who can support themselves otherwise, but who will remain on works in order to make a little money whilst the crops are growing; and to get rid of these I would at this period follow the course generally adopted in the Cuddapah District of, when times show decided signs of mending, turning off all coolies in good condition.

Mr. McC. Webster.—A fall in prices and increased cultivation, &c., decreasing number on works, decreased crime and wandering when the district officer comes to the conclusion that no special measures of relief are necessary, any special works opened, and the poorhouses should be closed. The ordinary works, if the budget allotments have not been worked out, should be kept open at the reduced rates of wage for some time longer until it is shown that the people will not come on the lower rate of pay. If the budget allotments have been worked out, it would be necessary to keep on the special works for a time, until they are no longer resorted to by any considerable number of people, but the poorhouses should be abolished.

Mr. Weekes.—Refusal of the distance, labour, and wage test when the condition of the people is manifestly not low, especially when there are good crops coming on and prices are falling. This indifference to offers of employment in scarcity must be very carefully distinguished from similar indifference during famine, when the people refusing are terribly emaciated, and are living on wild berries and leaves, and are especially during the rainy season extremely unwilling in their feeble state to leave the shelter of their homes and go to distant works. This is not the indifference of men who require no assistance, but the listlessness of despair and of extreme feebleness and sickness, so often observed as a famine symptom. I observed it in Kurnool in July and August 1878, and I should be inclined to think hundreds died in consequence of it. Distance tests and labour tests and closed camps in such times for such people are baneful in the extreme.

The other precautions necessary constitute the most difficult part of the relief officer's business and requires far more local knowledge than he can possibly possess or acquire. He must call in the aid of village magistrates and others who have the knowledge, and how to extract that knowledge is a difficult matter requiring both tact and sternness. These men alone can tell who of the non-emaciated can support themselves. The emaciated necesistate no inquiry.

MYSORE.

Mysore.

Mr. Ricketts.—In the case here put, the sooner the district officer admits his error the better; but I do not see how he could fall into such a mistake. Most, if not all, the indications noted in the preceding paragraph would be wanting. But few people, and those only of the ordinary labouring classes, would resort to the relief works if any had been opened, and if the wage were low and fair labour exacted, even the number of these "coolies" would very shortly sensibly diminish. Further, all the surroundings would indicate the real state of affairs, and the district officer would only have to close his special relief works.

The danger of falling into the error contemplated in this paragraph is very small; but there is the real and I think, frequent danger of assuming that because certain relief works are not at once readily resorted to, therefore there can be no very great distress, or at least that sufficient work is available elsewhere.

CHAPTER III.—REPLIES.

FAMINE RELIEF.

N.B.—In answering this and all other questions in this chapter, remember to draw the distinction (where necessary) between the three periods of Famine, its beginning, height, and decline, and also between Public Works Department and Civil relief-works.

It may be assumed that the State is responsible for offering the means of support to all persons not able to provide for their own maintenance during time of famine, subject to the imposition of such tests as will prevent relief being given to persons not really in want, and will protect the public finances as far as is practicable. The method of affording direct famine relief to persons in want in time of famine hitherto adopted by Government are :—

(1.) *Relief given, subject to a labour test, or in return for labour.*

(2.) *Gratuitous relief, not subject to any labour test.*

Relief work may be divided into that which involves—
(1.) *Unskilled labour, commonly earthwork.*
(2.) *Skilled labour for artisans.*

Gratuitous relief may be divided into—
(1.) *Relief given at poorhouses.*
(2.) *Relief at home.*

SECTION 1.

CH. III. QN. 2.

QUESTION 2.—PUBLIC WORKS DEPARTMENT AND CIVIL AGENCY WORKS.

The first division of relief-works for unskilled labourers may be into works supervised by officers of the Public Works Department, and works supervised by the civil officers: the former will generally be works of greater permanent utility, requiring more skilled supervision, and taking a longer time to complete; the latter will usually be less important, less generally useful, and simpler in character. State what are the circumstances under which either class of work is preferable. Referring to the considerations mentioned in paragraph 7 of the Resolution of the 16th May 1878, quoted in the margin, state also if you consider that there is any class of labourers to whom the one kind of work is more suitable than the other; and what are your reasons for this division.

> *"Officers trained in the Public Works Department should possess the knowledge and experience necessary for keeping order among crowds of relief labourers, for exacting from them adequate tasks, and for turning their work to the best advantage; but works conducted under their agency are not free from the danger of providing insufficiently for those who are feeble, or unable to give a fair out-turn of labour. District officers, without professional training, do not ordinarily possess the above qualifications in the same degree, and are commonly occupied with other duties. On the other hand, it is peculiarly the province of the district officers to make arrangements for receiving applicants, and admitting them to relief, for classifying them according to their strength and capacity for labour, for organising them into gangs, and thus encouraging members of the same village to keep together."*

Punjab.—Small works at beginning; afterwards large ones.

North-Western Provinces.—Concur with Bombay.

Bengal.—Various opinions are offered; one officer objects to works altogether, and would rely on remissions and loans. Others would have the able-bodied on piece-work under the P. W. D., and women, children, and the feeble on works near their villages under civil officers. Small works are recommended at the end of a famine rather than at the beginning.

Central Provinces.—Extracts from the replies compiled by Mr. G. J. Nicholls, C.S., and Surgeon-Major J. F. Barter, Sanitary Commissioner, under the orders of the Chief Commissioner, are printed below.

Madras.—Three European gentlemen have replied to Question 1, and 36 European and 1 Native gentlemen to Questions 2 and 3.

All officers agree that large works should be under the Public Works Department, and almost all consider that Public Works Department supervision is best in every case. Some (being civilians) hold that in no case should works be under civil officers; others urge that professional supervision being scarce, it is wasted on weakly and unskilled labourers; others again think that in such case the works should be directed by the Public Works Department, but the labourers selected and paid by civil officers.

Mysore.—Fourteen gentlemen (Europeans) have replied to this chapter in Mysore. The summary made of the Madras evidence is applicable to these statements.

Bombay.—13 officers have answered. The opinion is unanimous that all works are best placed under P. W. D. management, and that there should be able-bodied and weak gangs on the works. Small works under civil officers are only expedient for the feeble near poor-houses, and perhaps at the beginning of scarcity.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—On the first appearance of distress in the district, earthworks, which do not require any skilled labour, may be opened under the supervision of civil officers. Such works will consist of raising and improving district roads, excavating kacha tanks. Other simple works within the boundaries of municipalities may be also opened to afford work to the people. But when the distress becomes serious, and the number of applicants for aid be very large, works of the following description, which require engineering skill, may be devised and taken in hand under the supervision of an officer of the Public Works Department;—(1.) New roads and canals. (2.) Cutting drains for the conveyance of the surface drainage of the country to unirrigated fields. (3.) Rail roads where required; water supply for conservancy purposes in municipal towns. (4.) Works in connection with reclamation of marshes caused by floods and accumulation of rain-water and other drainage works. But in regard to forming gangs, making payment of wages and distributing food, the work will devolve upon civil officers, as already said. Able-bodied men should be employed on works which require hard labour and a little skill, and weak and infirm persons on easy and light works, such as spreading earth on roads, &c. No distinction of caste or creed should be made in giving employment to the distressed. Exception will only be made in favour of artisans, who will be employed on works in which they are proficient. Care should, however, be taken that the food is distributed to the different classes of persons *separately*, so that no unnecessary interference may be made with their caste prejudice.

Mr. Nicholl.—During the first period or during a temporary distress the employment of small gangs in many localities and in the vicinity of their homes is, as already stated, preferable. The advantages of this plan are:—

(1.) That you save the people the expense and hardship of leaving their homes for a short time.

(2.) You allow some of the members of a family to attend to their ordinary affairs while the other members are earning on the works sufficient to support the whole family.

Every one knows that a meal provided for three persons will, on a pinch, suffice for four, and that three persons who club together can live cheaper proportionately than each could separately.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Sandys.—No relief-works under the supervision of the Civil officers were undertaken in this district. The Civil staff is not strong enough to undertake such works, and the works, whether large or small, or whether carried out by efficient or inefficient gangs, should be conducted under the agency of officers of the Public Works Department. The distribution of the labourers into these two distinct gangs, and the absence of any hard and fast line as to the task required from the weaker classes of labourers, obviates the danger of works supervised by officers of the Public Works Department providing insufficiently for those who are unable to give a fair out-turn of labour.

Major W. Jeffreys, R.E.—My opinion is that wherever relief-works can be opened out under supervision of public works officers, they should always be taken in preference and under all circumstances Where no works of this kind can absolutely be started, it will then be time for district officers to conduct works under their own agency. The two kinds will never work together well in one district, as the paupers will generally leave the Public Works Department works, where work is measured and a task more strictly enforced, to go to the works conducted on laxer principles.

Mr. T. Stoker.—Until the extent and duration of the famine has declared itself, it would be obviously unadvisable to undertake a very extensive work; a sudden collapse of the famine would necessitate either leaving the work unfinished, in which case the money spent on it would be thrown away, or completing it as an ordinary public work, which would involve an expenditure which might not otherwise have been deemed necessary or proper, and under the principle laid down at the head of this chapter the necessity for starting relief would almost certainly arise before the famine had reached a state of development which would allow its future extent and duration to be properly gauged. But smaller works can be started with little apprehension of their being left unfinished. Their completion as ordinary works will entail less outlay, and as they are generally of more local than universal utility, those who locally benefit by them may be found willing to undertake the completion.

With the staff which will usually be available at the commencement of operations supervision can be more effectually exercised over small and detached than large and concentrated works; system is more easily enforced and full work more easily exacted. Smaller works can be safely entrusted to subordinate men, but a large undertaking requires not only an even greater proportion of subordinates, but also the constant presence of one or more superior officers.

And it is absolutely necessary that regular organization be introduced and enforced from the very first and sternly maintained. To compel order, punctuality, and full work among the disorderly crowd of ignorant and stubborn people who flock to a relief-work and have once become demoralized by want of discipline is, I believe, beyond the power of any staff that can reasonably be allotted. No one who has not experienced it can understand the hopeless and heart-breaking nature of the task. Discipline which can be taught on small works can readily be maintained on larger works if it be afterwards found advisable to draft the labourers on to such. Recruits are not drilled in regiments, but in squads.

At the earlier stages the tests of distance and labour can be more readily applied to small detached gangs, and it is to such bodies alone which that test can be applied, which I think the most crucial of all, viz., payments in cooked food.

It may happen that no scheme of an extensive work suitable to the occasion is ready. Small works can at all times be devised, and at all places, too, which is a strong point in their favour. The localities in which a big work can be undertaken are few, and none of those localities may be suitable. Small works excel in mobility.

Arrangements for conservancy, shelter, and perhaps for supply of food and pice, present less difficulty as the groups are smaller. It may, however, on the other hand, happen that difficulty of food supply may render it necessary to concentrate labourers where it can easiest be provided.

But with all these advantages there comes a point at which the numbers are too vast for employment on small works. I have said above that it is a necessary condition for these that a sufficient number should be progressing at the same time within easy distance of one another. I do not, except at the very early stages, when they are started as tests, advocate a number of small works scattered widely over different parts of the district; they should be capable of supervision by a responsible officer of high grade.

If the famine continue and increase in severity the small works of real utility will become worked out, and it will be necessary to have recourse to works of minor or only private utility to afford employment for all the applicants for labour.

At this point a large work must be preferred to a number of small ones.

But there are certainly circumstances under which it may be preferable as soon as the famine has declared itself sufficiently to admit the undertaking. No doubt a large work is always of more general and public utility; and so far as Government can by undertaking such as a relief-work lessen the demand on funds for ordinary works, it is financially a gainer. There are in many districts inchoate designs of large and useful operations which have often been contemplated, and as often deferred for want of funds. For the construction of such works famine relief affords an opportunity not to be thrown away. This is distinctly a circumstance under which a large work is preferable

To summarize, I would be influenced in the selection by a consideration—

(1). Of the stage of the famine.

(2). Of the extent and nature of the available supervising staff.

(3). Of the nature of the large works contemplated.

I do not incline to the opinion that there is any class of labourers to whom one kind of work is so much more suitable than another as to make it a reason for selection of that kind. It may be assumed broadly that all the labour will be unskilled, and whether the work be large or small, it must be such as can be executed by unskilled labour. Small works will certainly facilitate a division of the workpeople according to their efficiency. But the same end can, I believe, with a proper staff and organization, be attained by a proper distribution into gangs of the labourers on large works.

With regard to the employment of Public Works Department officers, I would as far as possible employ them on all works, large and small. There is not, so far as I know, in officers of that department, any inherent incapacity to discriminate the efficiency of labourers and task them accordingly. They are quite as well qualified as other officials to carry out the instructions which they receive, and a tendency on their part, if it does exist, to exact a full tale of work is distinctly a recommendation. I speak, however, under two provisos—

(1). That they are regularly employed and trained officers of Public Works Department, and not any chance comers enlisted for the occasion. On the works I had so-called charge of, out of four Public Works Department officials one was a lately discharged indigo planter, a worthy and respectable man, but perfectly useless, possessed of neither skill nor training, and another a drunken ex-private of Madras Fusiliers, whose only qualification was a knowledge of brick-making (he was employed on earthwork), and whose efficiency, if he had any, would have been hopelessly neutralized by his complete ignorance of Hindustani; and yet I was absolutely prohibited from interfering with or giving any orders concerning the work under charge of these men, because, being Public Works Department officers, they were supposed to know more about relief works than any of the unitiated.

(2). That the Public Works Department official be something like the same grade and position as the civil officer he is compared with. Though I see no natural deficiency in the Public Works Department functionaries as such, neither do I admit any such superiority as to place every one of them above every one in any other department. For instance, I could not (with all modesty) consider that my qualifications and capacity compared unfavourably with those of Private Murray, though I would cheerfully defer to the opinion of a professed engineer.

These two papers are not confined to this particular question, but cannot well be placed separately under the different questions treating of the subject. They are therefore inserted here entire.

NOTE BY COLONEL ALEX. FRASER, C.B., R.E., Chief Engineer, North-Western Provinces and Oudh, Public Works Department, dated 30th November 1878.

How best to deal with future famines.—It will take some time to submit a full report on the operations which have, during the last 15 months, been carried on in the provinces of the North-West and Oudh to alleviate the suffering of the people during the distress arising from the almost total loss of the autumn (kharif) crops of 1877, and the high prices which subsequently ruled the market in respect of the better classes of grains. But, as I am shortly leaving the service, I may usefully discuss now as briefly as possible, with the experience of the past, the measures which might with advantage to the Government and the people be adopted in any future development of similar distress.

2. It is not for me to say how far the Government of India may be prepared to repeal that Indian social law whereby the rich have hitherto provided for the poor; but it seems certain that, under the recent measures adopted throughout the country, the people are beginning to feel that the Government will take care of the poor, and that it is not therefore necessary for the rich to tax themselves for that purpose.

It becomes a question, therefore, with the Imperial Government to what extent general taxation must be levied to meet this new necessity.

With that question I do not, however, propose to deal in this note, leaving it to the Famine Commission for consideration, after that body has duly digested the mass of information it has called for.

The question to which I desire to address myself is—How best to alleviate suffering from distress or famine at the least expense to the State?

3. I believe myself that, whatever may be the humane efforts of the Government, considerable mortality is inseparable from the loss of crops, be the loss ever so much localised.

A loss of crop in a purely agricultural country means not only the loss of food which goes to support the body, but also the loss of those comforts of life—dwellings, clothing, cattle, &c., &c.—which go to protect it. Unless, therefore, food, clothing, dwellings, cattle, &c., be provided in full, the mortality will be more or less severe in direct proportion to the severity of the distress. Assuming this to be the case (and the fact of the mortality in these provinces, in Bombay, in Madras, or in Mysore would go to prove it for, whatever the measures which have been adopted, whether extravagant or economical, and whatever the organization framed to meet famine, great mortality has followed its attack), I say that Government can only hope to alleviate suffering and mitigate the effects of famine, but that no effort will prevent excessive mortality when comparison is made with favourable years. The means of mitigating the effects of famine may be classed as follows:—

I.—Extending irrigation, whereby crops may be ensured.

II.—Extending communications to enable food to circulate between parts of the country affected and not affected by failure of rain.

III.—Direct measures of relief to a distressed population.

4. The first two of the preventive measures noted in the last paragraph have already engaged the attention of the Government of India for some time, and no remarks need be made on them at present, further than to say in respect of I. that perhaps too little attention is paid to the extension of irrigation by wells in parts of the country where the spring-level is not far from the surface; but as regards the third point (III.), I would desire to put my views before His Honour, so that they may, if he thinks it desirable, be submitted to the Famine Commission.

5. In my opinion the following are the chief faults of the present system:—

(i.) Measures of relief are not taken soon enough to prevent people falling into low condition.

(ii.) Too much reliance is placed on the operations of the Public Works Department to relieve suffering.

(iii.) The organization of relief by the Public Works Department should follow that by civil officers, and not precede it.

6. I think the essential point to ascertain is when the people *begin to suffer*, not when they *begin to die*; but the great difficulty is—(i.) to find out the degree of distress in any locality calling for interference, and then (ii.) to ascertain the condition of each individual of so large a population. This I think can only be done by previous organization, and by the actual parade of the population of each village by the district officer or one of his assistants in any department.

If from actual inspection the district officer is satisfied that there is distress which it is necessary to alleviate in order to prevent eventual starvation, he should at once start a relief camp central to the villages affected, where cooked food, clothing, and covering, if necessary, may be obtained by the necessitous. The system of bringing all the poor, the infirm, the sick, to central poorhouses organized at the headquarters of districts or tahsils seems faulty, inasmuch as it induces the natural guardians of the ordinary poor to get rid of their responsibilities, which they might be ashamed to do if they remained in their own neighbourhood. It excites a sentimental fear that the people are suffering much more than they are when really the poorhouse represents a gathering only of all the poor and needy, sick and infirm, of a district whom their ordinary guardians find it hard to support; it concentrates disease, and renders epidemics liable, at great centres of population and near military cantonments; it renders sanitary management difficult and expensive; and many of the people, putting off their going to these places (for most, other than professional beggars, have a horror of them) till the last moment, die before they get there. The only reason I can see for establishing these poorhouses, other than for the large towns themselves, is that there are medical establishments at the headquarters of districts which are not to be found out in the districts. But the reply to this is that not one per cent. of the population are accustomed to European medical advice; that food, not medicine, is required; and that, in cases of sickness, where one of our own regular medical people is not available, recourse may reasonably be had to the ordinary village *hakim*, in whom the people themselves would possibly have more confidence. The main point I think in all organization for famine relief is not to adopt measures which have a tendency to break up the home life of the people; and if this be true, our system of great central poorhouses and great centres of work is to be deprecated.

7. The present idea, therefore, "that the pulse of distress should be felt by opening a relief-work," an idea not only accepted by the Government, but held by most civil officers, seems to me erroneous, because—

(I.)—Only certain classes will go to a relief-work such as the Public Works Department can offer them—at all events, at first.

(II.)—A public work cannot be usefully improvised all of a sudden.

(III.)—There is no reason why work should be confined to earthwork, of which many classes of the people have a sickening dread.

(IV.)—Useful earthwork is not always available.

In cases of distress the sole panacea seems to be to prepare an enormous scheme for public works, to collect an army of engineers, and myriads of picks and phowrahs, and to dig holes in the earth—useful sometimes, useless often—frequently committing the State to much greater cost than would have been incurred except for the pressure of distress, at a minimum of advantage to the people and a maximum of cost to the State. Besides the entire burden of relief is thrown on one class of officers, the gathering together of whom from all parts of India not only disturbs the economical management of ordinary works at the places whence they come, but often they come too late to be of assistance even at the part (affected by famine) to which they may be directed.

There seems no reason why one should not work more in accordance with the feelings of the people, and more in harmony with their ordinary occupations. Why should not a shoemaker make shoes? A weaver make cloth? A carpenter do his own work? A brickmaker make bricks? A mason put them in place (in the shape of bridges, which are the real want of the country, without which the earthwork thrown upon road or railway is worse than useless, and with which for ordinary purposes earthwork, at all events for some roads, except in approaches, might almost be dispensed with). A cultivator, why should he not be employed in the improvement of the land, in digging wells, which the well-sinkers and the masons together might make pucka? No; at present the most easy thing possible is to get rid of the importunate people by handing them over to the public works officer, while no attempt seems to be made to deal with the classes who have never had a phowrah in their hands or a basket on their heads in their lives, and who have a natural distaste for being turned into *coolies*.

And when the army of engineers have made their plans, it often happens that the condition of the people has not been rightly diagnosed, and that the distress does not exist, has evaporated, or has not set in with the violence expected, and the Government has gone to immense expense, has perhaps put a stop to most important works in other parts of the country, has taken on extra hands it is most difficult to get rid of, with little effect beyond that of ruining the finances, an effect which must eventually recoil on the people themselves.

8. Moreover, it often happens that a relief-work, in its present ordinary meaning of earthwork, is a kind of work to which the people will only resort at the very last moment. The consequence is, when that last moment arrives, a general rush on works, for which there is no adequate provision of establishment, and a multitude of starving human beings to whom must come death and disease for want of adequate arrangements for their comfort.

9. By means of such an organization as that sketched in the 6th para. of this note, and which I will define more fully in a subsequent paragraph, it would be possible to provide for all classes of workmen: all bringing their own tools—the shoemaker his awl and his last, the weaver his spinning and weaving apparatus, the carpenter his saw and his adze, the mason his trowel and plumb, the *hakim* his drugs and his plaisters; and all might be employed—

(i.) In building their own habitations;

(ii.) In making their own clothing;

(iii.) In looking after the sanitary condition of their camps;

(iv.) In looking after their sick;

while the Government would supply the materials and the food, from ordinary sources through the local traders, for the production of articles in which each class of artizan would be an efficient workman.

The aged, the young, the weak, the infirm, would thus be provided for from the first. Those who are strong and able-bodied and accustomed to public works, whether involving brickmaking, carpentry, masonry, smiths' or coolies' work, and on the condition that they are necessitous, would be provided for by the Public Works officers as one only of the agencies of relief.

9. This more minute agency would not be more difficult, because it might be carried out by the zamindars or native gentry for each village or group of villages, with European or other Government agency for inspection of a certain group of relief camps, and no party of able-bodied people should be sent to a Public Works relief work without a *chalan* from such inspector. Notice would be given of the probable number of people for whom work would be required, so that a probable establishment, engineer and medical, might be arranged for.

10. It seems to me to be the duty of the civil district administration to be responsible in all ways for relief, and to provide food and comforts until a proper organization for work exists; and then to distribute the available labour to the best advantage to the people and the Government, treating the Public Works Department as merely one (an important one certainly) of the agencies for the employment of labour. At present the agency of the Public Works Department is not only employed to test the existence of distress, but to undertake the whole, or almost the whole, responsibility of relief; and the heavy mortality which has nevertheless taken place, and it will

not be found to have occurred *on* the works, shows the system is *not* on the whole effective in the relief of famine-stricken people.

11. From past experience it is quite clear to me that the chief cause of mortality would be removed if the movement of the old, the young, the weak, sick, and infirm, the women and children, could be prevented, and they could be provided for at their own homes, while work is found for the "bread-winners" according to their capacity, strength, and previous training. People who in reduced condition begin to leave their homes (and they will not probably leave till they are in a reduced condition) for an unknown distance, and with an uncertain prospect of livelihood in the end, die by hundreds on the road, are often disappointed when they arrive at their destination, and die in double or treble numbers on their return. Once the people leave their villages, all power for relief seems to be at an end; or if relief is given on public works, it is given at an extravagant rate and with minimum advantage to people in the last stage of their strength.

12. I would say, then, generally that if suffering from famine is to be thoroughly met, the civil officers charged with district responsibilities must rely on themselves and not on the public works at the outset of distress; and that public works can be only utilized with effect in the relief of the able-bodied and the strong, who have no other means of earning a livelihood.

13. Before entering definitely into the way of carrying out the above principles, I would say a few words concerning the food to be given to the people. In the relief camps I would only give cooked food to non-workers or imperfect workers, and the people should provide the cooks. For able-bodied workmen and probably to women being *purdanashin*, I would give a money wage, which should be enough to cover a liberal allowance of food to an able-bodied man, woman, or child, and no more. No infants should be allowed on works; they should all be kept in the relief camps, and fed with cooked food or milk where the mother cannot provide the necessary sustenance. A nursery should be a part of the arrangements of all relief camps.

Now, instead of giving the 12 chittacks of flour + 9 pies to an adult man, 10 chittacks of flour + 6 pies to an adult woman or big child, 6 chittacks flour + 3 pies to a small child, other than an infant in arms, in special gangs of people in a *reduced* condition, according to the orders of the Government of India, I would give those rates to ordinary gangs of *able-bodied* people doing a full ordinary task of work on public works, and give the other rate of:—

10 chittacks flour + 9 pies,
8 " do. + 6 pies,
4 " do. + 3 pies,

to the gangs on the lighter employments of weaving, &c., in the relief camps; while the ordinary poorhouse rate of—

8 chittacks flour,
1¼ " dál,
¼ " salt, } with

vegetables twice a week, would be sufficient for the non-working adults in the shape of cooked food.

For children under 10 years of age the amount might be reduced to—

4 chittacks flour,
1 " dál;

and for children in arms not being nursed—

2 chittacks flour,
1 " dál.

I feel certain, and I am supported by all medical authority in the North-West, that people in a *reduced* condition cannot eat *more* than people on full work, though they may require special diet. On the other hand, if I ask a working syce or a hard working chapprassi what food he requires to keep himself in health and strength, he will say "*ser bhur atta pao bhur dal*," at both meals, while one's bearer or those doing less hard work would say "14 chittacks." When prices were high they would probably reduce their food if their masters did not pay them extra; and so I think, where the demand from an able-bodied man is the *full* task (and I would demand nothing less), and not "within 25 per cent." of it, the wage to cover the food should be sufficient to prevent the workmen falling out of condition; and to prevent this, and to get full work, it is quite worth while erring on the liberal side.

It must be remembered that our rate in the North-West has practically been for an adult male the value of 10 chittacks flour + 6 pies, which is the mean between the Government of India's maximum and minimum rates for ordinary gangs. The original principle of the Government of India was that we were to get a full task for a bare subsistence, and though these new orders upset all previous principles and rendered all discipline impossible, yet I have hitherto considered that we never have been able to get full work from anyone, and that the value of 10 chittacks flour + 2 dal + ¼ salt, which represents about the mean above noted, was sufficient; but if we insist on the full task, the value of 12 chittacks + 9 pies, with a reduced rate for short work of the value of 10 chittacks + 3 pies, will not be excessive. The great difference between maximum and minimum rates would probably be sufficient to induce the people to work the full task without further punishment. But I would give the magistrate special power to inflict stripes up to a dozen for continued refusal to work on the part of any able-bodied man accustomed to do public works or choosing to do them in preference to working in his own line. The main object of this proposal in respect of food is that I would give the increased amount *not* to people in *reduced condition*, as contemplated by the Government of India, but to the able-bodied doing *full* task, to prevent the possibility of their getting out of condition.

14. With the above remarks I am prepared to answer the question put at the end of my 2nd para.—How best to alleviate suffering from famine at the least expense to the State? I must start by saying that all campaigns require long preparation and permanent arrangement of means for carrying them on. A campaign against famine is the most difficult of all, and requires everything to be in perfect fighting order.

(i.) Therefore, whatever may be the conclusion arrived at in respect of the work to be exacted from the people, the first thing to be done appears to me to be to prepare a famine chart of each district which shall give the following information:—

(*a.*) Each village in the district shown on the chart by a numbered dot.
(*b.*) All roads.
(*c.*) All railways.
(*d.*) All rivers.
(*e.*) All canals.
(*f.*) The tahsils.
(*h.*) The police stations.
(*i.*) The dispensaries.
(*j.*) The sudder station, in a black circular dot of large size without number.

This chart shall be prepared by the district engineer and presented to the district civil officer, who shall then—

(ii.) Prepare a statement, to be written on the chart, showing—

(*a.*) The population of each village.
(*b.*) The number of such population in each class of occupation.
(*c.*) The name of the zamindar or zamindars owning the land to which the village belongs.

(iii.) This having been completed, the district officer shall—

(*a.*) Form the villages into groups, and fix the position of a relief camp, which shall be shown on the chart on the line of communication nearest a main line of road, or on a main line of road if there be one, or at a railway station if within the group, or on a canal if a navigable one, in a red ink circular dot.

(*b*.) The villages forming the groups should not be in excess in distance apart of the power of a sub-inspector to visit each day. This sub-inspector might well be the zamindar or other native gentleman, or junior native official, who would be appointed when required.

(iv.) From the above a chart should be formed of relief camps and communications only :—

(*a*.) Each relief camp being shown on the chart by a red circle, with the centre on the line of communication, and within the circle being written villages Nos. 0-to-0—the group of which it forms the centre.

(*b*.) These two charts shall then be submitted to the Commissioner, who shall—

(v.) Group on the chart :—

(*a*.) A certain number of relief camps, which shall be subject to an official inspector, native or European, and each of which it shall be possible to visit once a week. To this inspector, when appointed, a native doctor should be attached.

(*b*.) Then to enter on the chart the numbers of groups which shall be within each tahsíli, to which an assistant surgeon should be attached when necessary.

(*c*.) And then to divide, for famine purposes, the total number of tahsílis between the collector and magistrate's European assistants, whether of the Revenue, the police, or the Public Works Department; and the district civil surgeon shall be district inspector in matters medical and sanitary, while the Sanitary Commissioner shall be inspector-general of relief camps. The executive engineer of the division shall prepare these charts for the Commissioner.

(vi.) The charts shall then be submitted by the Commissioner to the Board of Revenue, who will submit to Government with remarks if necessary. The arrangements having been approved by Government in the Revenue Department, the charts shall be forwarded to the Public Works Department to be lithographed, and copies shall be kept in each department of the Government, with the Commissioner, with the district officer, with a spare copy for each of his assistants, a sufficient number of copies in each tahsíli for the inspector of each group of relief camps, and with a separate copy of each relief camp, with its corresponding group of villages, for each sub-inspector (see *b* of iii. margin). These small charts shall contain the particulars of each village referred to in (*a*), (*b*), (*c*.) of ii.

(vii.) We have now the whole country in each district mapped out for famine purposes. We know exactly the population we have to deal with, and the classes of people to be managed, the number of sub-inspectors and inspectors we require, and they all work up to the district officer and through the Commissioner to Government.

(viii.) Then, in case of any disturbance of the natural course of the seasons, the responsibility of dealing with distress shall lie with the collector. He will send orders to the assistant in charge of any groups of relief camps as laid down in his chart carefully to watch the course of the distress, and if aggravated the assistant shall call upon the collector to send him a medical officer, and actually parade the villagers within any particular group. He shall then report to the collector, who shall determine whether it be necessary to start a relief camp. If he thinks so, he shall do it at once, appoint a sub-inspector, authorise the necessary expenditure for the formation of the camp, to which all necessitous people shall be admitted.*

(ix.) Plans of dwellings suitable for the relief camp should be prepared by each district engineer, with due regard to the material at command. They should be of the simplest and cheapest character, and the people should be, with due regard to sex (families being allowed to remain together), pretty close together in the cold weather. In the hot weather they can well lie in *topes*, with only covered places for the sick. Families might be allowed to return to their homes at night until work was provided for them. The district engineer will provide such work as may be available in repairs, &c., and the sub-inspector or inspector will gather the workpeople of other kinds together, with their own tools, and providing the material, set them to work in their own line, either in camp or in their own homes. The kind of clothing which will be suitable for the people should be settled, and that should be first prepared, cloth being afterwards stocked for future sale when times get better, so with shoes, &c. The local smiths might prepare first the cooking pots, &c., and afterwards tools for public works. The local carpenters might erect first the houses for the people and afterwards handles, &c., for the tools, and both might make ploughs and other agricultural implements. The cultivators might be set to work improving the neighbouring lands. For instance, what better work could they find in the Jhánsi Division than trenching the land and eradicating the kans grass. Well-sinkers and masons might make wells for the neighbouring estates, and thus ensure the land against future drought.

(x.) The local Accountant-General and local Examiner of Public Works Accounts should submit to Government for approval forms of simple accounts which it would be necessary to prepare, showing by whom they are to be prepared, and how submitted, how posted, audited, and disposed of, and a committee might be formed between the Revenue and Public Works Secretariats, defining the forms of report which it would be necessary for Commissioners to submit to the Government.

(xi.) While the relief camps were in course of formation, the Public Works Department would be preparing plans and making arrangements for carrying out such absolutely useful works as may at any time have been contemplated; but the people should not be allowed to wait upon the requirements of the Public Works Department, but should be provided for at once in the manner indicated.

(xii.) Municipal towns should not be included in the charts. A separate list of them should be kept, and they should understand that they would have to provide poorhouses for their own poor.

15. With the above plan previously arranged for the whole of the country, we should be prepared for all contingencies; and if the object is to prevent the people getting into bad condition, which is the only way of preventing mortality to any extent, I am strongly of opinion that previous arrangements, such as I have suggested, will alone enable the Government to take the people in hand in time. The local Government is only responsible for giving effect to principles laid down by the Government of India, and has hitherto loyally done so; and though a mortality of three hundred thousand out of a population of forty-two millions cannot be considered much, when we consider the severity of the distress (and the length of time the people have endured it) and of the season, or when we compare it with the loss in money and lives in other provinces, yet if the Government of India determine that even such a mortality should to a certain greater extent be preventible, then I think

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* This need not necessarily be a camp *into* which all the necessitous should be drawn, but may be the centre *from* which relief may be given in the houses of the people; a depôt for food, for medicine, for clothing, &c., residence of sub-inspector, and may be a central village if convenient for the purpose.

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it can only be so mitigated by a scheme of previous preparation such as indicated above, and which seems only elaborate in so far as it is complete, and will remain complete for any length of time.

16. I have said that I would not in this note discuss the question of taxation to meet famine expenditure; but as I am, I expect, about to leave the service, I may as well say what is in my mind on the subject. It is this—

That when a famine affects any particular locality, it increases the value of grain in all other localities; and supposing that one-fourth of the whole of India be affected, the value of the produce of the other three-fourths is very much raised.

It does not appear to me, though I don't pretend to know anything of political economy, either unreasonable or inexpedient to make the producers of the three-fourths pay out of their abundance the cost of a famine in the one-fourth.

I calculated some time ago (how far I was right I don't know, but it could be easily verified) that one anna an acre on three-fourths of all the cultivated lands in India and Burmah would produce about two millions sterling a year, which, as it might be collected with the land revenue, would not be difficult of collection and would be a fair enough impost. I think the producer should pay this impost (modified in amount according to nature of crops), as he is the direct gainer by the famine. Where no crops are produced, or where only sufficient comes off the land for home consumption, the tax might not be levied. The proceeds of a tax of such a character might be credited to a general famine sinking fund, against which should be debited all famine expenditure.

Municipalities might also be legally empowered to levy a tax (say an additional house tax where such tax is already raised), which might in the same way be credited to a municipal famine sinking fund.

These taxes might be raised under a poor law, which, as it seems to me, it will be absolutely necessary to enact.

If there were a series of prosperous years the fund might stand at ten (10) millions sterling without further taxation; but directly famine expenditure again occurred, the tax should again be put on the parts unaffected by drought. The capital sum for municipalities might be fixed with reference to the number of inhabitants, at say about ten lakhs for every fifty thousand of people, which would represent the support for a year of man, woman, and child, at an average rate of one anna a day each.

17. The above represents, of course, only my individual opinion.

Alex. Fraser.

Note by His Honour the Lieutenant-Governor, North-Western Provinces, and Chief Commissioner for Oudh, dated Lucknow, the 12th December 1878.

I quite concur with Colonel Fraser in his valuable suggestions with regard to forming the villages in a distressed tract into groups. But I do not think his proposal to keep the women, the aged, the young, and the sick at their homes, and to employ the bread-winners only in their several avocations in relief camps would quite answer. It does not go far enough. I think, having got our groups and the requisite agency for inspecting them, we should see if we could not relieve *all* the destitute people at their homes through the instrumentality of the village authorities and of the zamindars. These last, as a rule, do little in return for the privileges which they enjoy. They were formerly responsible for the detection of crime and for the apprehension of offenders within the limits of their respective properties, and they should be so still, if only we could prevent the executive from being hampered and thwarted at every turn by the judicial authorities. But it is at least not unreasonable, in the presence of such exceptional difficulties as those created by a famine, to require them to co-operate with us actively, both in person and in purse, for the mitigation of the prevailing distress.

Professional labourers, among whom might be included ploughmen and all those who ordinarily derive their support from field labour, might be employed under village supervision on works near the village; but I would give the starving cultivator enough to keep him alive, recovering the amount from him afterwards, just like an advance for any other purpose; and, similarly, I would call on the zamindars, the village proprietors, and the well-to-do cultivators at least to assist the State by contributing their quota towards the support of their ploughmen and other persons who ordinarily work for them for subsistence. If they professed their inability to do so, I would give them a similar advance to be recovered in the same way. The chief difficulty would be to deal with the starving non-agricultural community, whom the agriculturists could not be expected to support; but I think, with a thoroughly well organized inspecting agency, these people might be relieved at their homes. I do not think it would be worth while to provide them with material and exact work from them each in his own trade, for we could never dispose of the produce, some of which would of course be perishable, while to come into the market to dispose of the rest would be to take the bread out of the mouths of the very people whom we had been assisting until the arrival of better times, so that to provide material to be manufactured into stuffs which we could not dispose of would be merely to incur the loss of that material. Nor do I see any way to providing a test which persons must comply with in order to prove that they are destitute and proper objects for relief. I would, therefore, feed for nothing those among them whom the inspecting officer who would weekly visit the village should declare to be really deserving objects of public support, but I would give them the smallest dole sufficient to keep them alive.

It is not to be denied that an enormous sum of money would be required to carry out these measures in the presence of a real famine, and it may be that the resources of the State would be inadequate to meet it, in which case I do not see that Government can do other than admit that Providence must to a certain extent be the victor in the struggle, and that it can go no further than it has the means of doing without landing the country in a state of bankruptcy, which would eventually be more ruinous to the community generally than the loss of some scores of thousands, or even of some hundreds of thousands, of a redundant population by the operation of famine. The only alternative that I can see is to stick to the present arrangements, which, as I shall show hereafter, are inadequate for the purpose, if that purpose be to save the greatest possible number of lives.

To carry out the measures suggested above, under ordinary circumstances it would be necessary to establish depôt centres, such as the relief camps suggested by Colonel Fraser, at which grain could be stored. I am by no means sure, however, that it would not be sound policy at once, before we are threatened with a famine, to establish a granary in each village. The number of people who would probably come on relief might be estimated, the period for which in an ordinary famine they would need support might be calculated, and lastly, the amount of grain which would be required might be determined. And the cultivators might be required to put that amount into the granary. At the end of a year, or at the end of six months, if it were decided that the grain should be stored at the harvesting of each crop, the supply might be taken out, used for seed or otherwise disposed of, and a fresh amount put in. This arrangement for the whole country would also, doubtless, cost an enormous sum of money. In fact, it would be providing the necessary amount of capital in the shape of grain instead of in the shape of money. But I am of opinion that the scheme, which was suggested by one of my ablest officers, Captain Pitcher, is worth thinking out by the Famine Commission.

NORTH-WESTERN PROVINCES.

At any rate, I am of opinion that, if the object of relief is to save the greatest possible number of lives, the present system of works and poorhouses is a clumsy and expensive failure.

It is expensive because it does not give a full equivalent for the sums expended. Unskilled labour is only of service in the case of large earthworks, and there are few such in these provinces, so that, when the vast Department Public Works establishments described by Colonel Fraser have been collected and paid for, it may be doubted whether the works are really remunerative, especially if, as is often the case, they have to be abandoned when incomplete at the end of the famine operations.

The system is clumsy, because it fails of its object. I can prove beyond the shadow of a doubt that thousands of people have preferred to die at their homes to accepting this form of relief, although they were perfectly well aware that it was available; and, moreover, it is questionable whether it is humane to compel artizans who are by habit and physique unfitted to undergo hard manual labour to dig for their support; and still more is it questionable whether it is right to compel the high-caste Thakur and Rajput, whose only fault is hunger, to perform a task which degrades him both in his own eyes and in those of his countrymen.

For these reasons I would rather see another system adopted, and I think the right system will be found in the direction indicated above and in Colonel Fraser's memo. This is but a sketch, as Mr. Caird wishes Colonel Fraser's memo. to be with him by the 14th instant, and I have, therefore, no time to go more fully into the subject, which, moreover, lies more properly within the province of the Famine Commission, to whom I submit these observations for what they are worth.

GEORGE COUPER.

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Mr. Magrath.—As before stated, I consider that large works are the only proper and suitable method of relief for the multitude, and that they should be properly laid out and conducted by Public Works officers. The Civil officers would be occupied in looking up the distressed population, sending them to the proper works, and looking after the helpless, the feeble, and those who cannot use the spade. At the same time I wholly dissent from any attempt to keep the people of villages together, as I consider it neither profitable nor practicable, and the attempt in the famine of 1874 to do this, as well as to classify the people according to their strength, proved a complete failure, and, coupled with the introduction of piece-work, suddenly led nearly to the immediate reduction of a large number of people to starvation. I think that most officers will allow that works conducted under the Civil officers were, with few exceptions, anything but a success.

Mr. O'Donnell.—It is certain that the greater part of relief given by Government (as at present advised) consists of relief-works, and it is certain that these relief-works cost millions of money. The question, then, that presents itself to me is whether it is not possible to devise some scheme of relief which will not involve the loss of 75 per cent. of the capital invested. I have not asked myself this question without making an effort at its solution. I believe that the forms of relief which subsequently involve the least loss to the State depend on the temporary remission of land revenue, the free granting of loans in cash, and the stimulation of ordinary trade and grain supply.

First.—The rigorous exaction of Government land revenue in a year of famine is felt, it will be allowed, most severely by the poor, and principally by the agricultural poor. If Government makes the Zemindar pay up his revenue, the Zemindar in turn must secure himself from ruin by exacting rent from his tenants; the result is that the tenants as a body, unable to recoup themselves from incoming crops, are forced to sell any stocks of grain they may have, and often to indent on their savings if they have any. When the tenant-farmers are in this position, the fate of the day labourers, who depend on them, is a very miserable one. To take the case of Behar, where two famines have been caused by the failure of the winter rice, the shortness of food was most felt from the 1st of December to the beginning of the rains. I know that it is a fact that the distress on both occasions was hastened by the exaction of Government revenue in the beginning of January in both 1866 and 1874. The great mass of the farmers of Behar had certain stocks of grain, which, however, they were forced to part with early in December in order to meet the demands of the rent collector. Unfortunately the purchaser was usually the village mahajun, who paid the least possible for the grain, and then kept it out of the market for months in order to raise its price. I do not exaggerate when I say that in very many tracts in Behar in 1874 the scarcity would have remained perfectly manageable until the reaping of the spring crops, but for the manner in which the land revenue demand was enforced in January in that year. At the same time, there is not the smallest doubt, as I hope to prove further on, that a suspension of revenue need only be temporary, and Government could within a couple of years recover every pice they had suspended. It will be said that suspension of Government revenue might not result in a similar suspension of their tenants' rents by the Zemindars. I answer that it would purely be the result of most blameable weakness in Government if such rent suspension was not made by the Zemindars. For my own part, I should have no mercy on men who refused to extend to their tenants the consideration which they themselves received. I am convinced that both Native and European opinion would support Government in most heavily fining any Zemindar who oppressed his tenantry in such a manner at a time of famine. The land revenue of Sarun is 12 lakhs of rupees. Famine relief cost 50 lakhs, 25 of which never will be recovered. I believe if the instalments of land revenue due in October 1873 and January 1874, 6 lakhs in all, had been temporarily suspended, 5 lakhs more judiciously spent would have seen the district safely through the worst period of distress which precedes the rains. I have heard both Natives and Europeans remark that the policy of Government seems to be first to exhaust the resources of the ryot, and then save him from the results of its own conduct.

Secondly.—I believe that the very best form of relief consists of a very liberal granting of loans in cash. I am aware that the giving of a loan presupposes some ability in the borrower to give security for its return, and I believe that there is hardly any family, even of day labourers in Behar, who could not give security for Rs. 20, which would be sufficient to keep such a family for eight months of the year. I estimate that there are 100,000 such families (of five individuals each) in the district of Sarun, and about 100,000 more of the poorer agriculturists. It seems a rash proposition to suggest the lending of 40 lakhs of rupees in one district, even to support a million of people, till it is remembered that 20 lakhs were lent out in 1874, of which 19 lakhs have been already recovered. It is quite possible that as high a per-centage of 40 lakhs might not be recovered, but it could never involve such a wholesale loss as the system of relief works.

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The relief given in 1874 in Sarun may be grouped and valued in rupees in the following manner:—

	Rs.
Advanced on loan—	
In grain - - -	13,50,000
In cash - - - -	6,50,000
Total - -	20,00,000
Recovered in three years -	19,00,000
or 96 per cent.	
Expended on relief works—	
Paid in grain - -	9,00,000
„ cash - - -	15,00,000
Total - -	24,00,000
Actual value of work -	6,00,000
or 25 per cent.	

Had the famine been properly managed from the beginning, no such vast outlay as this would have been necessary. Still the figures show, what I am now most concerned in proving, that loans are highly recoverable, whilst relief works are most extravagantly expensive. There is also the fact that the labourers on relief works are withdrawn from ordinary field labour —a mischief that can hardly be exaggerated. In 1874, had the hundreds of thousands of labourers on relief works been able to devote themselves to the produce of late *rabi* and *china* crops, many lakhs of rupees would have been saved. Again, large crowds of labourers generate the most fatal diseases; and lastly, they are infinitely more likely to become demoralized by famine than if they were assisted to live in their own homes.

The loans in 1874 were made principally to farmers, and it is now abundantly certain that they were solvent and able to repay their debts. There may, however, be some doubt that day labourers would be equally able to clear off their debts. They would at least be able to pay very much more than 25 per cent. of their borrowings. For whatever might remain, I would make the landholding villagers of the mouzah in which they reside responsible. One might safely trust them to recoup themselves by the labours of the labourers. It may be again objected that the labourers would abandon their villages in order to escape their debts. I can only reply that I do not believe they would. The farmers know their value a great deal too well to harass them into flight. Moreover, a debt of 15 or 20 rupees is not so great as not to be payable, at least in labour, in a few years by even a poor labourer of Behar. It must be remembered that his debt would not bear interest, and it is a fact that in all cases of agricultural indebtedness, such as exists in the Deccan, it is not the debt itself, but the hopelessness of ever getting rid of it; it is not the principal, but the ever-growing interest, that is the source of mischief.

Even after a most *grievous* famine in the district of Sarun, such as that in 1874 was rightly or wrongly supposed to be, I believe that if there were early suspension of land revenue, followed by loans in cash on local security to the amount of ten, perhaps twenty, lakhs of rupees, famine would be entirely averted, and by the end of three or four years both land revenue and loans would be recovered, with a loss perhaps of five or ten per cent. Government would also suffer the loss of interest on the loans, and this it seems to me, together with the above five or ten per cent. loss, might fairly be recovered from the people at large by special taxation. The trading class, it is true, gain very much during a time of famine; still it must be allowed that such a tax as the present license tax is wanting in certain elements of justice, inasmuch as it has been laid on *before* full and proper efforts have been made to recover the expenditure on famine relief from the persons and localities that profited by it.

Thirdly.—The importance of stimulating grain trade during a time of famine is so well known that I need not dilate on it. The Government is in possession of very full reports on the subject. I need only say that it is evident that my scheme of money advances would be of very little use in tracts which trade could not supply with food. I, however, do not contemplate such cases, which I believe are very rare, and which will become still fewer with that extension of railways and other means of communication which is so devoutly to be hoped for. Any expenditure that might result to Government from stimulating grain trade might also be justly recovered by means of special taxation.

Mr. Finucane.—I consider that ordinary professional labourers should always be employed under officers of the Public Works Department, and that cultivators and such weakly persons as are admitted to light labour gangs should be at first employed under Civil officers. My reason for this division is, that I think cultivators and other non-professional labourers are apt to suspect that the object of officers of the Public Works Department, in giving employment on relief roads, is not alleviation of distress, but, on the contrary, that they take advantage of the people in their need for the selfish purpose of pushing on their district works. In the case of Civil officers they have no such suspicion. They know that the making of roads and tanks is not a matter in which Civil officers can have any special interest other than the alleviation of distress.

For this reason, cultivators resort with much more confidence to works under the supervision of Civil officers, and this, too, without waiting to be driven to extremities. I noticed very great reluctance on the part of the ryots of Dinagepore to come on relief works at the early stage, though at the same time they declared they were in great distress. On asking an explanation of this fact from the Zemindars and ryots themselves, I was invariably told it was *Sarkari kam* ("Government work") which, according to their notions, meant all work and no pay. At a later stage, when regularity in payments had inspired the people with confidence, they showed no such hesitation. I do not, however, think that there will be any difficulty under this head in any future famine that may occur in Bengal or Behar. Gratitude to Government and confidence in its relief measures is at least one good legacy left by the scarcity of 1874.

In the second stage of famine, by which time the objects of relief measures, the system of payment and of measurements, &c., become known, and confidence is inspired, I would have no hesitation in drafting all able-bodied men off to the more important works under the Public Works officers. When cholera or other epidemic disease breaks out, I should think it preferable to employ relief labourers near their homes on village tanks, repairs of village roads, and similar works. I also think such works are always preferable until such time as officers of the Public Works Department have had time to properly survey, allign, and arrange for the construction of the more important works. What I mean is, that I think it preferable to employ people at the early stage on village works which are sure to be of some benefit rather than on more pretentious works, which being begun and carried on in a hurry, very often turn out of no benefit at all.

Mr. Kirkwood.—I reached Bhagulpore from furlough early in March 1874. Nothing, or next to nothing, in the way of actual relief had then been started. In the middle of that month I crossed to that part of the Bhagulpore district which lies north of the Ganges, and where alone there was much distress,—distress which deepened much towards the more northern and western parts. The commencement was two months later than it should have been. True the Public Works Department officers had already considerable numbers on their works. These were in receipt of a daily wage, the only qualification for which was that a certain unknown quantity of work should be done. The Public Works Department officials had already begun to complain that many of those coming on to their works were fit recipients of charity, and were too

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feeble to render anything like a fair return of work for the daily wage. They were beginning to beg that they might be relieved of the charge of such persons, whose circumstances were not fitted to the conditions of their work and whose presence did much to disorganize those who really could and should do full work. But they were told (and I think rightly) that they must go on affording relief to those feeble persons until our Civil agency was ready to take them off their hands.

We started, as I have said, two months later than we should have done, and it was very hard work to recover that lost ground. Establishments had to be organized out of very inadequate materials. Then the thing that had a first claim on our attention was the inspection of villages and the drawing up lists of those standing in need of relief, relieving gratuitously, then and there, those who had fallen into a condition which rendered immediate succour necessary. We were obliged thus to cut off fear of death by starvation before we could begin to reorganize existing relief arrangements. Owing to this cause, it was not until mid April that we had got light-labour works started, and not until the beginning of May that this relief was well afloat. It should have been so at the beginning of March. That it was not so meant that for two months many had been on the Public Works Department works doing next to no work and getting into lazy and demoralizing habits; while many, from whom those works were too distant, had been languishing in their homes and would now require some considerable gratuitous relief before they could become sufficiently strong to be sent on to the newly-started light-labour works.

The distressed parts of North Bhagulpore were in area about 1,800 square miles with a population of 800,000. Severe distress extended to about half of this area and population. Towards the end of April the numbers on the works of the regular departments (namely, those of the Public Works Department and of the Engineers of the Durbhunga Raj) amounted to about 50,000. In June these had dwindled to 10,000; and it was only the Divisional Commissioner's insistence that made the Public Works Department officers continue to employ even these reduced numbers for a further period. This reduction of numbers was in part the result of our organization of relief measures, and in part of the calls made on the population in May and June for cultivation purposes. Early in June, too, the continuation of many of the Public Works Department works was rendered impossible, owing to the land being under water. Nevertheless, there can be no doubt that in June the Public Works Department purposely contracted operations and closed works which were still possible, and which should have been kept open under the normal conditions of their department. That they did so was, I conceive, a serious mistake. It compelled large numbers to subsist on advances of grain who would gladly have worked. It was not any fear of diverting labour from the fields that led them to adopt this step. That fear was known and recognized to be groundless. They did so in order to comply with the purely departmental concerns of neglected estimates and office work, which the stress of the previous months in conducting relief had thrown into great arrear. I think that was hardly a sufficient cause. If this latter evil could not be obviated by the employment of extra hands, it seems to me a mistaken idea of proportion to regard its continuance as a greater evil than a stoppage of works. One of the consequences of this stoppage was that we had, as in some parts the only agency tendering work of any sort, to employ some (though few) people on our works and under our conditions for whom neither those works nor those conditions were designed; for other than gratuitous relief, they had no other means of subsistence left. In April there were on light-labour works a daily average (for the month) of less than 1,000; in May that had risen to 7,000; by June to 13,000; by July to 15,000; and by August to 23,000. The rise took place (*a*) as our operations extended; (*b*) as distress became greater; (*c*) as the regular departments contracted operations. From August the harvesting of murwa (a pulse in general use among the common people), the cheapening of food, and the gradual collapse of the crisis caused a rapid diminution of the numbers on our works. For September the daily average was 11,000, and for October 4,000; operations then ceased. Even in the most distressed pergunnahs we never had on these works more than about 6 per cent. of the population. But then it must be remembered that, though during May the condition of many men was such as to entitle them to a place on our works, yet in June the men who had recovered were carefully weeded out and sent for employment to the regular departmental works, or they of their own accord left to work in the fields. From June there were never 5 per cent. of our labourers grown men; a per-centage reduced from mid July to 3 per cent. Our works were meant only for women and children. Boys of over 15, and nearly all those of over 12 years of age, were rejected, unless their physical appearance pleaded for them. To this rule a few exceptions were made in favour of those who could not get work in a locality where the Public Works Department had ceased to afford employment. Throughout this time, too, it must be remembered that a few thousands were daily employed in a scattered fashion by local Zemindars, at their own cost, on works on their own properties and under their own management. It must be also remembered that, owing to the wise measure of sales of grain from Government golahs at high rates, grain was, from the end of April onwards, kept at a price less than three times that ordinarily prevailing, a measure of which the complete wisdom became, I regret to say, in my opinion, marred when, in the later months of July, August, and September, Government not only followed but led the downward course of the markets, and sold more cheaply than its limit originally fixed in March, of 10 seers per rupee, and even than its limit as revised in May, of 12 seers per rupee. In my opinion the 10-seer limit should have been adhered to throughout the operations, and the doors of the Government store-houses should have been closed so long as prices remained more favourable than that rate. It must also be remembered that, throughout this time, we had some five thousand persons maintained by the spinning and weaving relief operations, and that very large grain advances were, during June, July, and August, made to villagers on joint village security and on the security of Zemindars (all, I believe, subsequently recovered without trouble). The grain advances made during those three months by Government, apart from those made by the Court of Wards, were sufficient for the support of about 90,000 persons throughout that period, and in this way many who had hitherto been on the Public Works Department earthworks were supported while cultivating their lands.

It may be well here to note the total number of persons relieved during the three worst months of the year; namely, May, June, and July. Taking the daily average for the whole of those three months, there were (in a population of 800,000)—

(1.) Relieved by regular departmental earthworks - - -	31,000
(2.) By light-labour (earthwork). (Each woman on the work earned in those months enough to support herself and a young child not fit for work, not only on the days when she worked, but when no work was possible owing to heavy rainfall) - - -	32,000
(3.) By spinning and weaving relief - -	5,000
(4.) By gratuitous relief - -	32,000
Total - -	100,000

The incidence of this relief (on an average 12 per cent. of the whole population) varied much according to the intensity of the distress. In some parts it was not 5 per cent.

Besides this, an average of about 117,000 persons were for those months maintained on advances of grain made by Government and by the Court of Wards; and 175,000 additional persons were for a similar length of time subsisting on grain purchased from the Government stores. Other relief was afforded in the way of wages to cartmen, house carpenters, thatchers, and other employés. Ninety per cent. of the gratuitous relief was to persons in their own homes. In some parts fully 80 per cent. of the population were subsisting on Government relief in some form or other. These figures will give some idea of the extent of the operations of which I am speaking.

To return to light labour. In Bhagulpore we very exceptionally hutted people; we did not compel them to go far from their homes. The expenditure on hutting and on small store-houses on the works was under Rs. 1,000, and there was no necessity for more. The Public Works Department works, while in force, likewise did not, for the most part, draw people far from their homes, and were scattered, being mostly of the nature of roads running through the distressed parts; hutting even on these works was quite exceptional. This course was rendered possible by the numerous works opened in the distressed area. The light-labour works numbered exactly 100, of which 60 were tanks, 2 embankments, and 38 roads. The tanks were mostly old ones; the labour on them consisted in deepening and enlarging them, and in dressing and turfing the banks; some of the roads were new, and some were repairs of already existing tracks. The lines of road for our operations were carefully selected; at the close of the famine we left some few of them still undressed and unturfed for completion by the regular department. The works, considering that we had to be content with locally improvised overseers, whose only recommendation was that they could read and write, were not badly executed, nor were the financial results unsatisfactory. Each person actually working on our works earned on an average, per mensem, grain representing in value Rs. 2-4; 74,000 persons actually at work for a month received wages in cash and in kind, kind being converted into cash at the then current rate, equivalent to Rs. 1,66,426. In normal times at normal rates the work done by them would have cost just under Rs. 1,00,000; 42½ per cent. of the expenditure was due to the high rates paid and the unskilled nature of the agency employed. The cost of the establishments for these works, including a per-centage of the pay of the supervising officers engaged on other works as well, was 5½ per cent. on the remuneration given to the labourers. There was also an expenditure of more than Rs. 2,000 (or over 1 per cent.) on account of hutting and contingencies. In April and May rates were (in accordance with the April orders of Sir George Campbell) made very liberal on our light-labour works, so as to attract people and let them work for their living instead of receiving aid gratuitously. I think this course was, owing to the lateness with which we began, to some extent wise; though the rates might perhaps have been, without harm, kept a point lower. Task-work (by piece) was from the first everywhere enforced. The rate at first was 6 seers of rice (in May equivalent to 8 annas) per 100 cubic feet of excavation. This was subsequently reduced to 4 seers, and then to 2½ seers; while at the end of August, when the crisis was passing, a maximum earning rate was imposed, limiting the daily earnings of a man to 1 seer, of a woman to ½ seer, of a child to ¼ seer. I think this latter was not a correct course; rather, if necessary, the rate should have been further reduced. I also think that the starting rate might well have been 5 seers instead of 6 seers, without harm and with economy. The average out-turn per person per diem (men, women, and children) was about 25 cubic feet during the months of June and July, when the 4-seer rate was in force; some allowance was made, when fixing that date, for days on which, owing to rain, work was impossible; but such days were very few indeed in Bhagulpore.

On the Public Works Department works it was found during the cultivating season that a large proportion (about 50 per cent. of the workers) cultivated and worked on alternate days; in other cases some members of a family worked on the roads, while others looked to the cultivation. This was as it should be. I would note that, excluding those relieved by advances, sales, and works under the Public Works Department and Court of Wards, we, in North Bhagulpore, relieved either gratuitously, or by light labour, or by weaving and spinning, 287,210 persons for one month at a net cost of 13½ annas per mensem, after deducting the value of the work done by spinners and weavers, and of the earthwork done by the light labourers, calculated at the ordinary rates of ordinary years. This does not include the cost of establishments, but includes all other contingencies in the shape of buildings, &c. Of our outlay on light-labour works all but 42½ was recovered in estimated value; of our outlay on spinning and weaving relief all but about 39 per cent. was recovered in cash. Most of the disbursements were made in grain, which, for the purposes of the above calculation, has been converted into cash at the rates current from month to month at the Government store-houses. The rate was, for the most part, 12 seers of clean rice per rupee. It averaged over the whole time about 13 seers of clean rice, or about 14 seers if the clean and partially husked rice, of which there was a considerable quantity, are taken together. As the relief was thorough, and as the accounts were made up with precision, this expenditure seems to have been economical. Of course, those not so distressed, whose cases were met by sales, advances, and employment under the Public Works Department, were relieved at a much less cost.

In the Cuttack district during 1867, 44,243 persons were relieved on light-labour works for a month each at a total cost of Rs. 1,12,346. Of this sum, about Rs. 6,000 were expended on establishments, hutting, tools, &c. Deducting this (which is just the 5½ per-centage of Bhagulpore), the average receipt per mensem by each light labourer was about Rs. 2-6, as against Rs. 2-4 in Bhagulpore.

(*N.B.*—In answering these "labour" questions the term "Public Works Department officers" is meant to include the district engineering staff employed in Bengal under the Road Cess Committees.)

I would, at starting, venture to express my concurrence generally in the dictum contained in paragraph 6 of the Madras Government's letter No. 2232 of the 31st August 1877, addressed to the Government of India. This runs as follows: "A large "scheme of useful works under departmental super- "vision should be the backbone of the relief system, "all other forms of relief being subsidiary to the "main scheme, all relief works of any magnitude "being directed and controlled by agency belonging "to the Public Works Department. Large works "under professional agency should not be limited to "works which are directly remunerative, nor even "to works which may probably be finished during "the continuance of the famine." I would only remark that such an important and valuable labour relief as spinning and weaving should have found some mention in the scheme; and that, instead of the backbone, Public Works are, after all, only the ribs of a thorough system of relief; the backbone being the keeping of the price of food-grains in common use by Government, interference if necessary, within a fixed limit, which should be treble of the rates prevailing in an ordinary year. This is a matter which will be dwelt on at length in its appropriate place.

I must also venture with all deference to express a doubt as to the axiomatic nature of the proposition laid down on the subject of works in paragraph 20 of the Viceroy's minute of the 12th August 1877.

It is there laid down as necessary "to prohibit "absolutely, in the beginning of the distress, the "opening of petty works under civil officers, or "non-professional establishment among the villages “close to the homes of the people;” and further, it is essential “to allow petty village works to be “opened only when severe and widespread distress “has declared itself at a comparatively advanced “stage in any district or part of a district.” I think such works should be prepared when such a failure of crops as must cause widespread distress is assured; and that they should be opened the moment the demand arises for work on them by persons who should be entitled to have access to them and before widespread distress has reached an advanced stage. The one course means timely prevention of starvation and emaciation; the other may often mean an effort—generally in part a failure and a costly one—to rescue from death those who are already half-starved. I consider that the persons entitled to the privilege of working close to their homes with easy rates (in all cases on piece-work) are all women, except those who are professional earth-workers, all children between seven and 12 years of age, some male orphans between 12 and 15 years of age, and feeble or infirm males above the age of 15. I therefore would also venture to demur to another conclusion expressed in the same paragraph of the Viceroy's minute, and repeated in paragraph 26, that relief must be refused “to strong, able-bodied persons “of both sexes in any form save employment on “the large public works.” There are able-bodied weavers I would employ on weaving; there are able-bodied women and children I would employ on light-labour earthworks; there are able-bodied women of some respectability I would employ on spinning. I think in thus writing I am speaking in accord with the teaching of the past. I think the success of the relief arrangements in Cuttack (1867) and in Bhagulpore (1874) was, in some measure, owing to the adoption of the classification I advocate and the opening of works, either large or small, as near as possible to the homes of the people. If success was not attendant on the efforts made in Southern India in 1877, and in August distress was still found to be “increasing with frightful rapidity,” I do not attribute more than a comparatively small portion of this result to the Public Works policy to which I venture to take exception. I think failure may have been predicated as more or less certain under almost any system of relief which allowed prices for long months to stand at from 5 to 10 times their ordinary figure, while the officials, in defiance of those prices, spoke of the grain-supply as being sufficient. But I think there are grounds for supposing that the adoption of the policy of arbitrary rejection of persons from works and of designedly concentrating people on certain large central works at a great distance from their homes, thereby leaving the labourer the alternative of death or what was a virtual emigration, had much to do with aggravating the disaster.

Able-bodied male labourers should be employed on roads, canals, embankments, and such other permanently useful and heavy works as the Public Works Department officers may be able to provide. The main objects will, in such cases, be to see that the works are of a nature really required, that the work is well done, that all who apply for work are admitted, that full piece-work is exacted, and that, with an increasing distress, works of this nature are multiplied and opened in as many places and as near to the people's homes as possible. Until prices become double those of an ordinary year, the piece-work should be at the ordinary Departmental Public Works rates. When prices are slightly higher than that, there should be an increase of 25 per cent. in the rate paid, and, if prices approximate to a quadrupled rate, that increase should be extended to 50 per cent.

These works should be commenced when any considerable failure, such as a one-third failure of harvest, is assured. They should be increased in number according to the area and degree of failure and the number of applicants. Let but the indispensable condition of payment by piece-work be enforced, and there would be no fear of those or any other works being resorted to before distress compels. Such works can of course be opened too late, but they cannot be opened too soon, except that, if the distress is not sufficiently great, the establishments will be idle. Let the test of payment by piece-work be absent, and the administration of famine-works will drift helmless at the mercy of a peculating crew of subordinates, and of the lazy impulses of a people, one of whose distinctive peculiarities is an inordinate love of sloth.

In the early days of the Behar famine (1874) piece-work was very generally not introduced. The consequence was that the dimensions of the peculation that went on were only equalled by the unchecked laziness of the crowds who flocked to the works.

As for the other class of labourers, which should, as I have said, include all women not professional earthworkers, and all children from seven to 12 years of age, together with any boys of between 12 and 15 years of age whose domestic circumstances may demand some concession, and any males of above 15 years of age whose feeble condition may plead for them, they should be employed on works of as useful a nature as possible in the vicinity of their homes, such as village roads and village tanks. The rates of remuneration given them should be from 40 to 50 per cent. higher than those given to the other labourers, but piece-work should be strictly enforced. Sometimes they may be usefully employed on a portion of the works on which the able-bodied labourers are employed.

It would be of the first importance that no person should be admitted into these 2nd-class gangs other than those for whom they are intended.

Emaciated new-comers into these gangs should, on first arrival, receive a gratuity sufficient to last them for a few days, while they are regaining strength and nibbling at the work.

If I understand aright the classification of labourers advocated by Sir George Campbell in a resolution, dated 3rd December 1873, when he was preparing for the Behar famine, I cannot fully concur in it. Class I. labourers were to be those who could perform a full day's work at the usual rates; Class II. labourers were to be all who could not do so. For “usual” rates I would read “usual rates somewhat enhanced in accordance with the rise in the price of food.” Women, not professional earthworkers, should be excluded from the Class I. labourers.

When the failure assured is a half-crop failure, preparations should be made, during the month or two following on the harvest, for opening works here and there for these 2nd-class labourers. But they should not be actually opened until there is a clear demand for them among the persons for whom they are intended.

This would hardly ever be the case, under such circumstances, for at least two or three months after the harvest. When the failure assured is three-fourths or higher, or prices become trebled for any time, then these works should be prepared even before harvest time and should be opened almost contemporaneously with the 1st-class works. The works should be so situated that the people at work on them should be able to go to their homes of an evening. Careful supervision and task-tests are as necessary on these works as on the works on which Class I. labourers are employed. It is thus alone that recipients will escape debasement. The main objects on these works will be the preservation of the lives of many who either cannot or should not emigrate from their homes even for a short time, and from whom it is well to exact work rather than that they should be relieved in idleness, the check of dishonest idleness, the encouragement of industry, and the prevention of peculation, while excellence or economy of construction should be considerations of a very subordinate nature. To a certain degree of course economy is enforced by a system of payment by piece-work.

I would notice paragraph 58 of the memorandum of measures for relief published in the *Gazette of India* on the 26th September 1868. It is there laid down that on works for these 2nd-class labourers "a bare subsistence is given for whatever work the labourer can perform," and this is contrasted directly with the ordinary works on which a full rate of wages is given and a full quantity of work is exacted in return. In my view there should be no contrast between the two. Task-work should be exacted on both sets of works; the remuneration for that task should, on both sets of work, be something slightly more than a bare subsistence for the majority of those working, and would thus be subsistence for the more feeble or inexperienced. The difference should be in the amount of work required for each rupee given, and that difference should generally be that whatever the 1st-class labourers get paid for doing three cubic feet of work the 2nd-class labourers should receive for doing two cubic feet.

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Mr. Hewlett.—I think that works under civil officers should be avoided as much as possible, as it renders supervision and medical administration so much more difficult. I have seen, during the late famine, men, women, and children of the artisan class, such as weavers and tailors, put to earthwork. They were not fitted for it, and it told heavily against them.

Mr. Hart.—As a temporary or provisional arrangement, works under the civil officers may be found convenient for keeping the agricultural labourers close to their homes; at the same time such small works will often afford a test by which to sift the really needy from the lazy or vagabond population.

General Wilkins.— Relief works for unskilled labourers during the late famine were divided into public works and civil agency works. The theoretical definition of the two divisions of works was:—

1. *Public works* for the able-bodied.
2. *Civil Agency works* for the less capable or semi-able-bodied, which definition could not be maintained in practice by reason of the able-bodied being accompanied by their less able-bodied relatives. Government laid down that 75 per cent. of a normal task was to be exacted from the labourers on public works, and to meet the actual circumstances above mentioned, as it was conceded that relatives and friends should not be forcibly separated, the 75 per cent. task was interpreted to mean 75 per cent. of the individual capacity of the labourer.

The Civil Agency works were inaugurated for the less capable or semi-able-bodied, for whom a labour test of 50 per cent. of a normal task was ordered. Civil Agency works were entirely in the charge of district officers, and these works were started in several localities at head-quarter stations, and in the vicinity of the homes of the people.

In my opinion all works upon which a labour test is exacted should be placed under the direction of the Public Works Department. I concur fully with the considerations mentioned in para. 7 of the Resolution of the 16th May 1878, and hold the opinion that the respective duties of the Public Works officers and district officers are well defined in the paragraph quoted.

Small village works might be necessary near villages for the employment of feeble persons capable of performing some work near their own homes, which works might be placed under the direction of local district officers.

District officers should be connected with works only so far as passing to them applicants fit recipients for relief, organized into gangs based on relationship or village connection, and classified as able-bodied or semi-able-bodied, subject therefore to a three-quarter or half normal labour test.

Mr. Propert.—Taking works altogether, Public Works Department supervision is preferable to Civil, and all large works should be under the Public Works Department. I consider Civil works admissible in two instances: 1st, at the commencement of scarcity or famine, when district officers have no means of judging the number of persons really requiring relief at that stage, the opening of *small local* works upon which the minimum rate of pay is obtainable very quickly shows the authorities the actual state of the country. These works should, however, be continued only until larger projects are prepared and arrangements made for carrying them out. 2nd, Civil works are useful throughout a famine for the employment of the weak, the old, and other classes of the people, who will simply rather perish than transfer themselves and belongings to large works at a considerable distance, where strict supervision is maintained and a full task exacted. The pay, however, on Civil works should (as was the case in Bombay) be always somewhat less than that on large works under the Public Works Department.

All persons tolerably able-bodied, who are accustomed to out-door labour of any sort, may fairly be drafted to large works under Public Works supervision. There are other persons, however, totally unaccustomed to hard manual labour, such as small tradesmen or manufacturers in towns, &c., those who are feeble, partially crippled, &c. With regard to these it is more merciful and perhaps more advantageous to employ them on light work near their homes at a minimum rate of pay than to force them upon large projects, where their daily wages would as a rule be reduced in consequence of their having performed an insufficient task.

Mr. Norman.—I consider that all relief works should be supervised by officers of the Public Works Department. In the earlier stages of distress task work may be rigidly enforced. At the height of a famine the rules regarding the exaction of tasks may be slightly relaxed. On all works there should be famine gangs, composed of weakly persons who should never be paid less than bare subsistence allowance. To every large work a district officer should be attached, whose duty it should be to pass applicants for relief on to the works, and to weed out from the ordinary gangs those persons who, he thinks, should only be employed in famine gangs. The only works which ought to be carried on by Civil agency are small works near relief camps and poor-houses of such a nature as can be undertaken by the inmates, who should, if possible, never be allowed to be idle.

Mr. Spry.—From what I have seen of what are styled "Civil Agency" works, I am not an advocate for them. I consider that *all* works should be under the Public Works Department, where they can be properly supervised, which it is impossible to do properly with the civil officers, who cannot give the undivided attention which Public Works officers can. The labour tests, of course, must be modified so as to suit the capacities of the workers, and the labourers must be classed in gangs according to their capabilities. This being done, I do not see why Public Works officers should not supervise the whole. In every family seeking relief there probably is one or more less or non-able-bodied member. If the Public Works Department take only the able-bodied, and civil officers the others, the result must be that a separation of families takes place. This, very naturally, the people will not submit to, and consequently to every Public Works Department work some less able-bodied people will be hanging on, and to every Civil agency work some able-bodied. It is much better to have only one agency.

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Mr. Charles.—I do not think that civil works should ever be established as a measure for the final employment of labourers. They should be used merely as a stepping-stone to Public Works Department works, and there should be one at each mustering centre, so that the officer charged with admitting persons on works should be able to send the weaker labourers for a time to the Civil works, and the stronger at once to the Public Works Department.

Mr. Moore.—In my opinion large relief-works only should be undertaken, and these should include a great deal of earthwork, which would provide labour to all classes of people, the able as well as the feeble. I object to small and scattered works under district officers. They are only to be tolerated when there is no large project ready, or when distress shows itself and, there being a doubt as to its duration, it is considered inexpedient to entertain the establishment necessary for a large work.

Mr. Hamilton.—I think large works are in all cases best; and as such works are usually carried out by the Public Works Department, I should put all labourers under their officers. I do not think that small works are admissible at any period of a famine. It is quite impossible, so far as my experience has gone, to supervise a number of small works satisfactorily, except at a great outlay on establishment, and I think a famine may be fostered by opening a number of small works under Civil officers, who can perhaps only visit each once a week. As a rule, I think skilled labourers are but slightly affected in times of distress compared with the rural population. It is never a very difficult task to find employment for such artisans as masons, for instance, as their services are requisite on all large works, as railways and canals, and they need not be specially classed as famine labourers, but treated as at ordinary times. A conveniently situated large work, as a railway running through an affected district, ought to provide occupation for all classes of the population.

Mr. Percival.—All relief-works should be under the Public Works Department. Each work should admit two classes of workers,—the feeble, on a minimum wage, and the strong, on a wage proportioned to their work. It is not easy to get work out of the weak, but the Public Works Department can do it better than the Civil Department.

Colonel Anderson.—In my opinion, all works proper should be under Department Public Works officers. The only works which should not be under them are those of a trifling nature, in which infirm and aged people might be employed not far from their homes or place of relief.

Mr. Robertson.—I have already stated that, as far as it is practicable, all works should be under the Public Works Department, and that only the aged and those physically unfit for proper work should be employed under Civil supervision.

With reference to the latter part of para. 3 of the Resolution of the 16th May 1878, no person should be admitted to any work unless he has received an order for admission, signed by a District officer. The District officer should examine all applicants for work, send all he finds fit objects for State charitable relief—

(*a.*) If able to give a fair out-turn of labour, to a Public Works Department work; and

(*b.*) The aged and those physically unable to give a fair out-turn of work, to some work under Civil agency.

I consider it is not a question of the class of labourers for either kind of work, but entirely a question of physical fitness.

Mr. Bosanquet.—As I have said in my answers to questions under Chapter II., I think in the commencement of a famine large central works under the Public Works Department are advisable. It will depend a great deal on the sufficiency of wages given to persons so employed what further kind of relief work becomes necessary. After a time, artisans, like weavers, who, in consequence of the pressure of the times, find no sale for their manufactures, and who are unfitted, by the habits of their lives hitherto, for earthwork, may require assistance by raw materials being given to them to work up. As the famine continues, and private charity is less liberally given, and relief-houses, supported wholly or in part by Government, are established, a certain number of persons will be found who are proper inmates for such relief-houses, but who can do some light work. This light work may, in the case of many of the women, be spinning indoors. The boys and men, and a few women, may be found capable of doing some very light out-door work, as clearing gutters, &c., work of little or no value, but which it is desirable for the people to be employed on in their own interest, so that they may not become demoralized by continual idleness. It might be a consideration whether the opportunity might not be taken advantage of for the young boys and girls in relief-houses to receive some kind of instruction in reading and writing. But the matter on which the Commission appear to be anxious to obtain an opinion is whether any kind of works known in the Bombay famine as "Civil Agency works" should be established or not.

One difficulty relief officers have to contend with is the unwillingness of people to leave their homes to go to a distance for labour. Speaking generally, this difficulty does not apply to strong, able-bodied men, but to those who are past middle age. These latter often prefer to remain half-famished at home, and consequently after a time become fit recipients for gratuitous relief. It is for persons of this description only for whom it might be considered advisable to establish "Civil Agency works." I would prefer, however, if possible, to bring work conducted by Public Works agency within a certain distance of the homes of these persons, and to take every available means for inducing them to accept labour on such work than to establish civil agency works. My objections to "Civil Agency works" are those pointed to in the margin of paragraph 2 of the questions of the Commission.

There are also certain persons who purposely let themselves down in physique in order to force the authorities to feed them gratuitously. When I say they let themselves down, I mean that they intentionally refuse to go on the works because they know that after a time, when they become too weak to be able to work, and the authorities fear their contumacy may cost them their lives, they will get fed for nothing. I shall have occasion to allude to these people further on, in question 25 of this chapter.

Mr. Gibbs.—I would have only two kinds of relief: large works for those who can work, and gratuitous relief in villages for those who cannot. I would not advocate moving these people, the sick and infirm, from their villages into relief camps if the village officers can look after them; but we must have relief camps for the wanderers. I would, however, have no small village works; if a man can dig at all, I should say he must go to a regular relief work. The village relief should be from house to house, under the care of village officers, and be confined to those too ill or too old to work, or to those who must be left to take care of the sick and infirm.

Lieut. de Villamil.—Large works are in *all* cases preferable; they can and should provide work for the weak as well as the strong.

If the work require no professional skill to carry out, it is, of course, immaterial whether it be carried out by the Public Works Department or by Civil officers; but as large works will generally be works of permanent utility, they will, of course, generally require to be supervised by an officer of the former Department.

Very *old* people, who have no strong relatives, might be employed on light work under Civil officers near their villages; but in no case should *weak* people be put on these works; they will be much better looked after on a large work. Besides, it appears to me unsound policy to give people *less pay* (as is generally done by putting them on Civil Agency works) *because they are weak.*

Weak people should be separately ganged, paid more frequently, tasked lightly, and they should get the highest rate of pay until they shall at least have had a chance of "putting on flesh." This appears to me to be the more economical plan in the long run, and it is without doubt the most humane.

Convalescent coolies (from hospital or relief camps) should be treated in a similar manner. If the coolies once find they can get work near their villages if they get thin, they will refuse to go to large works. This has caused, I am firmly convinced, a large mortality.

Old people would obviously never be of much use on large works, and, the per-centage being small, it might be advisable to leave them in their villages, but it is a question which is open to argument.

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Mr. Martin.—Though no question is *asked as to whether* other forms of relief are possible, I conclude from the small print heading of the chapter, and from the fact that the next question is marked (2), that a question is asked, and as I have an opinion on the subject I give it.

I think that Government might enable people to get a proper sale for their ornaments instead of leaving them to make their own bargains with the chetties.

They could do so in two ways—

(1) Advances might be made of money on the security of jewels up to, say, 50 per cent. of their value, and the jewels so obtained might be stored in the Government treasuries until a fixed time (say a year) *after* the close of the famine operations, up to which time the owners might be permitted to redeem without interest. All the jewels remaining at the end of the time might be sold by auction or melted down and turned into bullion.

(2) The jewels might be bought outright at about 70 per cent. of their cost, and at once melted down or otherwise disposed of.

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It is for the interests of Government that people should not part with what property they have much below its value, for say that Government action insures that people can get at least 70 per cent. of the value of their property, and that they can only get 25 or 30 per cent. from the chetties, as I believe was the case in this past famine, it becomes probably necessary that Government must spend the difference, *i.e.*, 45 or 40 per cent. of the value of this property in supporting people who would otherwise have supported themselves, or, in other words, if the people's sale is a little above two millions sterling, the Government spends one million unnecessarily, and many people are unnecessarily harassed and degraded.

Sir W. R. Robinson.—As famine advances large, well-organised works may be extended. But in the earlier stages smaller works will be found less subject to misadventure and more easily arranged. The mere matter of the provision of tools and appliances should restrict early effort to small and more easily provided works.

No children should be permitted to labor throughout a protracted famine on public work. They must be otherwise provided for.

Mr. Price.—I consider that the period, when a famine has determined itself but the people are still in good or fair physical condition, is that at which works of the class under the officers of the Public Works Department can properly be taken in hand, these involving the distance and labor, but *not* the wage test. When matters grow worse, and those who are not accustomed to out-of-door work are obliged, by reduction of strength, to seek assistance, I would open smaller works, such as deepening wells, clearing out channels, and improving village sites; and these might be placed under civil officers, but, as I have said before, I think that the superintendence of all work would be best held by the Public Works Department. The difficulty as regards this would be the necessity for a very large staff, which would be costly. To meet this I would suggest the conduct of such petty works under the direction and inspection of officers of the Public Works Department, civil officers looking directly after the coolies, paying them, &c.

Mr. Grose.—When a famine is assured, large works should be established under officers of the Department Public Works, at which any number of able-bodied men will be employed and the full task exacted. Two or three such works in a district will be sufficient. There should be several small works, two or three in a taluk, at which, though honest work is exacted, the full task is not. These must afford employment to artisans unused to earthwork, such as weavers, and to people reduced by starvation. People must be selected for employment on these smaller works by the civil officers, and civil officers should pay them their wages at least twice a week. The Department of Public Works' system of accounts makes this payment take place at irregular intervals. The organisation of gangs may be left to the Department of Public Works' officers in charge. So far as it is desirable to keep members of the same village together the natural feelings of the people will produce the requisite effect without interference. I have given an opinion in favor of a number of works, because I believe distance is a dangerous test. The mere fact that a relief-work is at a distance induces a man in want of relief to stick to his village, living for a time on leaves or roots, till he gets so reduced that walking the distance to the work kills him. It is only when famine has subsided that the test seems to me safe.

On the great works the system should be much as usual in ordinary seasons, except that hutting and medical attendance must be provided, and that the wages must be sufficient to meet the high prices which will prevail.

On the smaller works the wages should be subsistence wages and vary with the price of grain.

As the famine decreases the smaller works will be deserted gradually. The larger works may be kept up so long as is considered necessary, wages being lowered from time to time.

Mr. Longley.—I am of opinion that civil officers should not be called upon to supervise the execution of work. They have not, as a rule, the requisite training, and are ignorant of the mode of taking measurements. Their time can be more usefully occupied in other items of relief, and their ordinary duties, which must be performed concurrently with the supervision of labor, would interfere with their efficiency in the latter. There have been, and will always be, notable instances where civil officers have been exceptionally qualified for the supervision of relief-works, but such instances must be the *exception.* The question here is whether the employment of civil officers in this capacity is generally desirable, and I

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have no hesitation in saying that it is not. Where exceptional fitness exists, it will come to the surface, and be utilised accordingly. Under this head I am referring principally to Europeans. Natives will in a much larger degree be found in civil employ, who are fitted to supervise relief-works; but I maintain that, admitting this, their services in other branches of relief administration would be more valuable.

I consider that in all cases (weavers and such specialists excepted) relief will be more efficiently given on works of permanent * utility, supervised by Department Public Works' officers, subject to the provision that the latter are to be subordinated in every matter not purely professional to the collector of the district. The weakly and those unable from custom, &c., to give a fair outturn may be employed on works less important and simpler in character.

The case of the specialists above mentioned should receive special attention.

Mr. Crole.—As a general rule, wherever possible, and especially when the famine pressure is *not* great, the first division of relief-works (permanent utility) should be employed for the relief of distress. When they fail to absorb the numbers alone, should the other divisions be opened. My experience has been that the breaking of metal along the various lines of road is the most suitable, useful, and economical method of employing the feebler laborers. As they improve in condition, they should be drafted off to the other works.

Mr. Austin.—So far as practicable I would leave all relief-works in the hands of Public Works Department officers. These officers are accustomed to dealing with large bodies of laborers, and should be far better judges of the capacity for work of even an individual cooly than the civil officer, who has probably never had occasion to supervise the actual working of a gang of coolies in his life. Moreover the civil officer lacks the time the supervision of relief-works requires. His Revenue and ordinary office work is not much lessened in time of famine, and his magisterial work is enormously increased. The civil officer, therefore, clearly lacks the two most important items to enable him to supervise relief-works with profit—time and technical knowledge. The care of the very weakly laborers who are not fit to be removed to any distance from their own villages might be left with advantage to the district officers. These might be best employed on petty and simple works, such as the clearing of fresh water wells and tanks, clearing of village sites, and the repairing and improving of village roads.

Mr. Martin.—I have already given my opinion, in answer to a former question, that civil relief works are preferable at the beginning of a famine, especially as acting as guides to civil officers in framing their estimates of distress. When it is once decided that distress will be severe, the Department Public Works should take the works from the civil officers, opening them with reference to their utility and not with regard to the distressed locality whereby the civil officers will previously have been guided. The field laborers, tank diggers, and the class of persons who are ordinarily employed under the Department Public Works on roads will, as a rule, be the persons to be employed on the Public Works Department works.

The village artisans, the Mussulman part of the population, the ruined puttadars who ordinarily employ labor, the Chucklers and Pariahs, men and women above forty-five and children below sixteen will ordinarily be found only fit for civil labor.

My reasons for this division are that the task required on Public Works Department work is sufficiently high to require practice at digging and a knowledge of the way to husband the strength best while using the spade. It is a light task for regular laborers inured to it from childhood, but to persons to whom such work is new it is very distressing, and when prolonged becomes too much for them.

Old persons of all classes (I consider forty-five old for a laboring Hindu) are, as a general rule, unfit for a high task, and it is very bad for young children to have their strength unduly taxed while they are growing.

Mr. Knox.—As a rule, I would always employ the officers of the Public Works Department or other professional men to supervise the execution of works of all kinds. It is clear that in the case of works requiring skilled labor this course must necessarily be pursued. But even in the case of works requiring unskilled labor it is more likely that they would be done economically and well if supervised by engineers. To carry out the earthwork on a road is not a work requiring much skill, but the experience of the last famine has shown that even this cannot be done properly by unprofessional men.

2. It is not an economical use of the agency at the disposal of Government to employ men out of their proper sphere, for their capabilities are not then brought out to the best advantage. Besides this the Revenue officials of a district have generally so much of their own work to do that if more special work be put on them, the ordinary administration of the country must suffer.

Mr. Jones.—At a very early stage of the famine I think civil relief-works will best suit the circumstances of the population, and even here, if professional supervision can be obtained for the work being turned out, I think it will be all the better. The ryot classes, especially those actually engaged in cultivation and looking to that alone for the means of subsistence, would prefer, when driven by necessity, to take any work in the neighbourhood of their homes, so as to be able to take early advantage of any improvement in the season for the cultivation of their lands.

Mr. J. W. Rundall.—Large relief-works are suitable for all classes of the agricultural population accustomed to out-door labor, smaller works for the poorer ryots, weavers, and petty artisans.

Lieutenant-Colonel Prendergast.—I would select the works from the general appearance of the people. A large work under the Public Works Department is primarily preferable to small works; and it may happen that there are easy portions of the large work where the weaker laborers may work separate from the able-bodied. But where this is not the case, the weak had better be drafted to other minor works.

Major Ross Thompson.—Work of whatever nature, should, as far as practicable, be carried out by the Public Works Department, as they can employ labor to the best advantage.

Sick persons and those unable to turn out fifty per cent. of what they could do when they are in good condition, should be employed under civil and medical officers until they are fit for work under Public Works' officers.

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* Irrigation works, &c.

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Colonel Sankey.—As to the general question, which Department should supervise this or that work, or class of people, I have no hesitation in saying that the Public Works Department staff can undoubtedly better employ labour, whether able-bodied or feeble, than any other; but that, practically speaking, when the

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numbers seeking relief increase with the intensity of famine, they cannot, so far as I have seen, look after all satisfactorily; and a rough sub-division, somewhat as arrived at in Bombay, Madras, and Mysore, according to physique, would, I think, have to be made.

By segregation and a judicious arrangement of the piece-work rates, with the people working in families or village-gangs choosing each their own paymaster, sufficient provision can be made to allow a certain portion of the feeble working with the rest, and thus much may be done without attempting too hard-and-fast a line of distinction; but I am clearly of opinion that, as a general rule, all persons requiring medical attention should be cared for by the Civil and Medical Officers; also that, in practice, people who have fallen to and below 50 per cent. of the normal in their physique had better be under the same agency till fit for work under the Public Works Officers.

As to the suitability or otherwise of peculiar descriptions of work for various classes of labourers, the sub-division must be left entirely to the officer in charge, who, to the women, children, and feeble, would usually assign weeding, collecting or breaking metal or gravel, and spreading the same, carrying earth, water for tramping, &c.; while on the able-bodied would devolve excavation of moderately stiff soil, tramping embankments, or consolidating road-metal, &c.; and on the strong all work requiring the use of the crowbar and sledge-hammer, and work in stiff or hard soil, &c. All but the last operations may be considered suitable for those classes who have not been accustomed to hard manual work—the soft-handed, in fact; but at starting the tasks must be light for such persons.

Major Moncrieff.—If the Public Works Department have establishment sufficient, I think they should undertake all save the smallest of relief works.

If for any reason it be resolved to cover the whole face of the country with relief works, the result will be a degree better than if gratuitous relief were scattered broadcast, but the practical value of such works will be very little. The district officers are sure to be exceedingly busy during a season of famine. The Public Works officers should step in and take on themselves all the organization of labour. As I have already said unity of action between the two is indispensable. The Public Works officer must also fairly grasp the idea that relief works are primarily for the sake of the workmen, and that any measure which interferes with the object of the work, viz., relief, must be rejected, such as petty contracts, infrequent payment of wages, cheap rates, &c.

It is most valuable to have a civil officer to assist the Public Works officer, to help to bring labour to the work to classify it, to see to the sick, the camps, &c.

Mr. Ricketts.—Civil relief works are, I think preferable as a beginning, and in order to pave the way for larger Public Works Department work, when found necessary. In isolated localities, too, where the carrying on of a large Public Works Department work is either not necessary or feasible, then the smaller civil work is a desideratum. When famine is declining and there are only few persons to support, then, too, the small work is advisable. Again, if the strength of the Public Works Department is weak and the civil line strong, then likewise the civil work might claim the preference. In other respects the larger works of the Public Works Department, and for the reasons given in the body of this paragraph, must claim the preference. Length of completion itself implies perfecting of all necessary details. Further, Public Works Department works are preferable in vicinity of large towns where the numbers will not only be great, but there will also be much dodging and cheating.

Colonel Johnson.—It appears to me I have already answered much of this question above. Except for the employment of distressed people, too weak or feeble to be sent to Public Works Department works, no other works should be opened where there are public works in the locality. When relief works are necessary in a locality in which there are no Public Works, and no Public Works officer is available to put in charge of them, they may be placed under a revenue officer, or any other officer specially appointed for the purpose. It is my opinion that all people physically unfit to do a full task should be provided for on a special work, or on a special portion of any work under an officer with special powers to deal with them. These should be drafted off to able-bodied works as they become fit for it, and measures taken to prevent them from going back again. Until this be done, they may be worked or tasked in any way it may be thought proper, but the point to be kept in view is to fit them to work with the able-bodied, and on no account to bring down the able-bodied to work with them. This is in my mind the most important division to be made amongst relief coolies.

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Question 3.—Large and Small Relief Works.

Relief-works, again, may be conveniently divided into small and large; that is to say, works employing (say) 300 or 500 labourers for about one month only, and works employing a larger number of labourers for a longer period. Though this division generally corresponds with the division into Civil and Public Works Department works, it does not necessarily do so; a small work might be under a Public Works Department officer, and a large one under a Civil officer. State under what circumstances you consider small works to be admissible, and what the advantages and disadvantages attached to them are at different periods of a famine.

North-Western Provinces.—Concur that the time for small works is at the beginning and end of a famine, when it is an advantage to have the people near their homes.

Bengal.—The great desideratum is held to be the having of works open close to the people's doors, and small works are generally preferred, especially at the close of a famine, except by the engineer officers.

Bombay.—12 officers have answered. The general opinion is against small works under civil agency, which are only admissible at the beginning and end of a famine, and during a famine for the aged and weakly only.

Madras.—Some officers hold that small works are most useful at the beginning and end of a famine, when people should be near their homes for agricultural purposes; others that they are only admissible at the height of a famine, when large works are crowded and water grows scarce, and every possible weapon has to be used in fighting the calamity.

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NORTH-WESTERN PROVINCES.

Captain Marshall.—In the earlier stages small works have the advantage of enabling those with large families to find work within reach of their homes. As a rule, unless the whole family comes on to the works, the portion that come must either return to their homes at night or sleep without

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bedding. I have found this difficulty impede the progress of some works this year, but still I would rather have the large works and transplant the whole family to the spot.

Captain Home.—Small works are admissible under the following circumstances:—

First.—Where distress is believed to be temporary.—They would be very useful to enable the people to tide over the difficulty, and would have the advantage of giving the people work near home, and of not committing the Government to any great expense. The disadvantage would be the difficulty of supervision, but this could probably be arranged for, either through the Public Works Department, Civil or Municipal authorities.

Second.—Where distress has become an established fact, and is likely to last some time.—At this stage small works should be reserved for the weakly labourers, who are unequal to the task-work which would be exacted from them on the larger works. From this point of view no disadvantages would be attached to them, while the advantages would be the separation of the weak from the strong, the absence of undue crowding, and the power of bestowing more care on them.

Major Jeffreys.—Small works are admissible where the scarcity is confined to one locality or to one or two classes of the community.

Thus, when a famine has begun to show marked signs of amelioration owing to fall of rain and crop prospects, &c., it often happens the cultivating class get amply provided for with advances from the landowners, while the non-agricultural class who live in villages—the Koris (weavers), Juláhas (weavers), Chamárs (leather-workers), sweepers, dhobis, dyers, cotton-cleaners—are left wholly destitute, because the community cannot afford to employ them. I have seen distressing cases of this after the worst effects of the famine on the purely agricultural class have passed away. On such occasions small works conducted by district officers, when the labour test would not be strictly applied, would be peculiarly beneficial.

Mr. Sandys.—Heretofore drought alone has rendered it necessary to start relief works in this district, and the distress has always lasted more than one month. The only circumstance then under which small works would be admissible would be at the very commencement of the famine when there was a great and sudden demand for employment throughout the district which could be met only by starting small works supervised by Civil officers in all parts of the district. These small works should be closed as soon as ever the Public Works Establishment had been so strengthened as to be able to take in hand large works of greater permanent utility.

The only advantage in small works is that the health of the labourers is likely to be better than when they are collected in large numbers. They would also afford employment nearer the peoples' homes, and might thus attract some who would take the chance of dying in their villages of starvation rather than seek work at a distance. The number of such, however, would not deserve consideration if a fair rate of wages and not too hard a task were exacted at the larger works.

The disadvantages of small works are obviously that more supervision is required; that they are less useful; and that as soon as the distress is over their completion will be indefinitely postponed.

Mr. Kennedy.—The only period at which small works are really useful is at the beginning and at the decline of the famine. At both these stages it is important to keep the people near their homes, and for this purpose small works are well adapted, as a number of such works can be started in different parts of the district. The only small relief-works commenced last year in this district were at Tilhar and Kant; in the former case they were worked through the municipality, and in the latter under the magistrate. The supervision was sufficient so far as work was concerned, but in the case of the Tilhar municipality insufficient with regard to the admission of all applicants. Complaints were made, with justice, that the Native members of the Municipality who managed the work gave employment exclusively to Muhammadans. In general small relief-works are to be deprecated. They are more difficult to supervise, and it is more difficult to test the necessity for relief, and when executed they are seldom so useful.

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Mr. Worsley.—I consider that at all stages of a famine small works are preferable to large works, because (1) the massing of large numbers of persons is avoided; (2) no demoralization takes place; (3) supervision is easy; (4) halting expenses, &c. are saved. I may explain that in a large work I do not include a large line of road, divided into a large number of sections, each of which is treated as a separate work.

Mr. Henry.—At an early stage of distress, when the State, while offering employment, is anxious to ascertain the extent and severity of distress, works on a small scale are open to the following objections:—

1st.—The cost of efficient supervision would, with regard to the value of the work, be large.

2nd.—Without efficient supervision adequate tasks are not exacted from the labourers.

3rd.—Numerous small works opened in different parts of the district would be likely to render the distance test less operative. At the same time, once the existence of widespread distress is assured, the proximity of relief works would enable the old and weakly (who are most in need of help) to reach them without much difficulty.

With small works less provision for hutting and sanitation has to be made, and it might be found possible to give a lower wage, the labourers being able to supplement what they received by such additions as could be obtained from their village, jungle fruits, vegetables, &c.

Towards the close of famine, at the time when field work recommences, small works near the labourers' homes enable them to subsist, and at the same time prepare their lands and sow their crops; whereas if only large works were provided, those labourers whose homes were at any considerable distance would be unable to look after their fields, as their absence there would entail loss of the relief wage for a period of days.

The result would be that many fields would remain untilled, and the out-turn of the coming harvest would be injuriously affected.

Mr. Kirkwood.—As regards famine relief, and not future benefit, I find no reason for supposing that any advantages attach to small works over large, *or vice versâ*. The advantage of giving people work near their homes is in no way dependent on the size of the work. Supervision can be equally effective in the one case as in the other. The question will be—which is most needed for the permanent benefit of the locality? and, if the work thus selected is situated at a distance from the homes of those to be relieved, another question will then arise as to whether the superior benefit likely to be conferred by the work outweighs the disadvantage of taking the people from their homes. There may be conditions, such as those

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above mentioned, where work cannot, owing to natural difficulties, be provided for the people near their homes. But it must be borne in mind that (especially for Class II. labourers) the advantages of having works open close to their doors is almost paramount. A great proportion of women and children, and very often men too, manifest a great reluctance to leave the neighbourhood of their homes. Often they would sooner die. If no work is opened near a famishing village there is great danger of a heavy mortality. The administration report of the North-Western Provinces for 1868–69 says:—"Experience too "plainly proves that vast numbers will not avail "themselves of any distant sphere of labour. They "will rather die at their homes than emigrate, and "for these, especially for the women and children, "and the men of the families who prefer remaining "with them, work must be provided at near and "convenient localities." These are remarks which such experience as I possess fully endorses. It may often be that, when the distress is not very severe, local Zemindars may be induced to undertake these village works, employing the people to a sufficient extent on tanks and village roads, and (if they desire it) taking advances from Government for this purpose. But where no such public-spirited individuals exist, or where the distress is severer and more widespread than they can cope with, Government must step in and open such works wherever they may be required and no influential resident is already meeting the demand.

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Mr. Hewlett.—For Civil agency works, if such are established, I think the old and infirm should be selected, but I would much rather have at each large work supervised by officers of the Public Works Department a gang into which all such could be classed. Less work, of course, would be demanded of them, and they would be under daily medical supervision. I think, too, at these large works there might be an artisan gang, where persons manifestly unfitted to work at earthwork might be employed.

General Wilkins.—Small works are admissible and convenient at the commencement of a famine, but as my opinion is in favour of placing all works with a labour test under the management of Public Works officers, it is unnecessary for me to discuss the question raised in this paragraph.

Mr. Propert.—Small works are undesirable except for the purposes noted in the last section. The advantages of them are that the people can be better and more carefully looked after. The disadvantages chiefly consist in the increased number of separate establishments required for their supervision.

Mr. Norman.—I consider that at no period of a famine is a small work admissible if a large one can be undertaken without inconvenience. A large work costs less for supervision. The best works for relief purposes are the excavation of irrigation canals and the construction of earthworks for railways and roads. Such works can be opened up along a long line at the same time; and this enables the labourers to be housed in different localities, instead of all being crowded together in one spot.

Mr. Spry.—I think small works should only be undertaken either when it is expected that the distress necessitating relief will be of short duration, or when famine being on the wane and large works completed, people will have to be employed for only a short time longer. Small works during the height of famine only give the maximum of trouble with the minimum of results, for they have to be so numerous that they cannot be properly supervised.

Mr. Charles.—I do not think small works are ever desirable, except to fill up the time before a project for a larger work can be got ready. A Civil work at a mustering centre ought to be large enough to occupy 500 labourers for several months. This might be the case on quite a small tank or road, as the only class of labourers who ought to be on Civil works, viz., very weak or diseased persons, can do but little, and the use of the Civil work is more the maintenance of discipline and the prevention of overcrowding in the houses for gratuitous relief than in carrying on work rapidly.

Mr. Percival.—Opening small works encourages the people to refuse to go to the large works. As soon as it is certain that there will be large numbers to provide with labour, it is better to stop small works, but the large works should not be too far apart. If no irrigation tank, railway, or similar work is available within 40 miles, a road should be opened.

Colonel Anderson.—Small works only expedient in the very opening when famine is doubtful and numbers small. If large numbers have to be provided with work the supervising organization will be strained to the utmost, and must therefore be concentrated.

Mr. Robertson.—My experience during the late famine has made me a very strong opponent of works under Civil agency, and I would not open any such works unless compelled to do so as an emergency. Of course this does not apply to Civil agency works for the aged and unfit. There are no advantages to be obtained by small works under Civil agency; they lead to wholesale fraud and confusion.

Small works under the Public Works Department may with advantage be opened when the intensity of a famine is a matter of doubt, and as a purely tentative measure, when people will not go to long distances as they require to be near home. At that time they long to hurry to their homes with the first good fall of rain. Again, small works may to a limited extent be opened when a famine is passing away, and as a means of employing the few who then require relief, but who will of their own accord move away on the first favourable turn in affairs.

Mr. Bosanquet.—I have above explained why I think that in addition to large central works under Public Works agency, smaller works under the same agency may be permitted. I have also explained that I would if possible avoid works under Civil agency if of a nature to require professional knowledge and supervision, works which, having to be estimated for beforehand, have to be tested afterwards in order that their value may be ascertained.

Lieut. de Villamil.—Small works have every disadvantage and no advantage that I am aware of either for the coolies or Government.

On large works (where there is presumably a resident officer):—

(i.) Payments are more regular.

(ii.) Shelter is probably better.

(iii.) Arrangements for the sick are better.

(iv.) Sanitation is better.

(v.) Food supplies are more regular, probably better and cheaper.

(vi.) The inspection of the coolies is facilitated by the concentration; sick people being removed to hospital, and specially treated.

(vii.) There are not the same facilities for swindling by the subordinates.

On small works (presumably under a native subordinate), which are necessarily scattered, extortion

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and rascality frequently—I might say generally—run riot; if a cooly get sick he is lost sight of, gets no pay, and frequently dies of starvation.

I know many cases where this has actually occurred.

Mr. Keyser.—I would have a few large works under the Public Works Department so situated, if practicable, that no distressed village should be more than twenty miles from a work. Instead of Civil agency works for the weakly labourers, I would have weak gangs for those who could not do a full task. There may be people who, though they can do a little work, are unable to go far; and for these it might be necessary to have small local works; but I would avoid them as much as possible. I allude to such people as the very old, women with a lot of children and no male protector, families of village servants, &c. We paid the village servants 2 Rs. a month, on the ground that their usual receipts failed in the famine; but that did not support their families. We employed such people on simple works like clearing out tanks, &c. "Direct relief" we divided into two classes: those who are able to be moved into relief camps, and those who are physically incapable to move or be moved, and who must be fed in their villages. I had a camp for every ten or twelve villages—not enclosed—they mostly got lodgings in the village; but at one place I hired houses for them; at two other places I built huts. The greatest number was 600, but I generally had 100 or 150 in these relief camps, and this includes travellers. They were fed once every day with cooked food; a woman got 12 oz. of flour baked in chuppatis and 4 oz. of dal; a man got 15 oz. of flour and 4 oz. of dal. The Belgaum ration gave a man 18 oz. of flour, but I found it was more than people could earn on Civil agency works, so I reduced it. The children's rations varied with their ages. I found by experience that this ration was enough for men who did not work and were not emaciated at first.

MADRAS.

MADRAS.

Mr. Price.—I consider that at the beginning of a famine and after it has passed the climax and is on the decline large works are preferable to small.

The chief reason for this view is that such small works as can be found for a famine are, as a rule, not profitable; that, providing efficient supervision being difficult, the people employed upon them can shirk far more easily than on large works, where they can be more closely watched; that, as they are small, they do not afford occupation for any lengthened period or for any large number of persons, and that enforcing the distance test in regard to them cannot be effected without harassing the people, that a much larger staff for paying and accounting is necessary, and that when they are finished it takes much longer to inspect and get the accounts adjusted; lastly, that they are not likely to be of such permanent benefit or profit to the State as larger and properly matured works. I am of opinion that when a famine is at its worst period, and it is necessary to secure water-supply for drinking purposes, and to afford, to what are usually the non-laboring and weakly classes, help without allowing them, more than is possible, to fall into the idea that the State will give aid without an equivalent, that small works are admissible. I would not, under any other circumstances, employ them as a means of relief.

Mr. Grose.—I have stated that numerous small works are wanted for laborers who are not able-bodied as soon as famine is assured. Before famine is assured there should be a few such works near the tracts where the distress is greatest. They will be the most economical way of assuring safety at that time. As the famine diminishes the smaller works will be deserted one by one, and may be closed; only want of professional supervision can justify putting a large work under a civil officer.

Mr. Longley.—Except where the supply of drinking water for man and beast is insufficient (and in this case the supervision of the civil officer will suffice), I am of opinion that small works, though in some ways desirable, are, as a rule, objectionable. In the case of temporary local distress, where small works would not be in danger of overcrowding from non-distressed villages, small works may be desirable, but the ordinary budgeted works under Public Works Department, local fund board, or municipality ought to be sufficient to meet such cases. But where famine has been clearly diagnosed small works must be *minimised.* So long as native nature remains what it is, the great mass of those needing relief will not leave their villages to go to a distant work. They will stay and slowly starve and die at home, or, when reduced below the standard physically needed for work, will take to wandering and become demoralised, and will oscillate between wandering and camp life; when sent to a relief-work they will generally desert as soon as sent.

The objection to small works is that they are too scattered to admit of adequate supervision, and so small that by the time a gang is fairly settled down to work the work is closed, and the coolies have to be shifted or left to shift for themselves. The local officers are caused endless anxiety by having to provide relays of such works, and there is no time to estimate for them properly, while a change of weather may render all attempts to check measurements impossible. Again upon small works it is impossible to provide proper medical assistance for the sick and weakly, and the opportunities for fraud are endless. But the chief advantage—and it is no light one—attaching to such works is that, if properly supervised, they would afford relief (in a form which is not demoralising) to a great number who will never comply with the distance test, and, if the money and supervising staff were available, I would say that no system of relief by providing labor would be complete unless some labor were provided for all *weaker vessels* needing it within easy walking distance of their villages. Improvement of village sites, making or repairing local roads, repairing small tanks or ponds, &c., afford employment at least for a time, say a year. When small works are exhausted the laborers must be moved to large works. I would not confine the former (small works) to weakly alone. This would prevent premium on low condition.

Mr. Crole.—Small works are only admissible when the famine is at its height. The difficulty about supervision and payment renders the opening of such works very unadvisable, if avoidable.

Mr. Martin.—I consider small works admissible only at the beginning and close of a famine. At the beginning for reasons I have already stated, and at the end to enable the officers in charge to apply the test of distance to persons who may appear to be clinging to the works from habit, instead of returning home to resume their ordinary occupations.

In the height of a famine they are very objectionable because of the extreme difficulty and expense of supervising them properly, or guarding against their being altogether monopolised by persons of the immediate neighbourhood. People soon learn that the test of distance is being applied, and they alter the place they come from without hesitation.

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Mr. Knox.—This is chiefly a question of supervision. Provided that sufficient work was provided for those in need of relief, it would be immaterial to the people themselves whether there were a few large works or a greater number of small ones. But it is obvious that, in the former case, it would be much more easy, at less cost, to ensure regular and effective supervision, for small works would probably be scattered all over the district and the supervising staff would have to be very large. Further, during the height of a famine it would probably be necessary to make arrangements for a supply of grain, &c., being brought to the works, for giving medical aid, and for providing shelter. All these matters could be more easily arranged and economically carried out the fewer were the number of the works.

Mr. Fawcett.—Small works are only admissible in my opinion in three cases. These are—

(*a*) In the beginning of a famine when no large works are ready, and it is absolutely necessary to give the people some employment until they are.

(*b*) At any part of a famine when any small work appears to be so urgently needed, on sanitary or other grounds, as to overpower all other considerations.

(*c*) At any part of a famine when employment has to be provided for people physically unable to do the tasks set on large works under Public Works Department officers.

In these three cases small works are necessary. The following are the disadvantages attaching to small works so far as they occur to me :—

(*a*) *Difficulty of proper supervision.*—Difficulty of proper supervision, at least without a staff several times larger than what would be required for large works. If all the works in a taluk where distress is severe are small, there must be a great many of them scattered all over it. If some are large and some small, the difficulty will be lessened but not taken away.

(*b*) *Not of permanent utility.*—Generally speaking small works are not of permanent utility.

(*c*) *No distance test.*—If a small work is opened, it is in all probability opened near the homes of the people supposed to need relief. Thus there is no "distance test." If nothing but small works are opened, or if a great many small works are opened, they are scattered all over the taluk, probably one in or near each village. Thus many people would probably come to the works there who would not care to go ten miles to them, and who might therefore be assumed not to need relief.

(*d*) *Expense in transferring when each small work finished.*—Extra expense and delay in constantly transferring the coolies from one work to another as each small work was finished.

(*e*) *If only small works, constant trouble.*—If only small works were carried on, there would be constant trouble and uncertainty in looking out for new ones to take the place of those in progress. This however is an extreme case.

Mr. Jones.—Small works, I consider, will be of use at the beginning of a famine, especially if it is doubtful whether an improvement may not take place. It tends for a time to keep the people in their usual places, so to speak, watching further results. As the famine increases in pressure the able-bodied poor should be drafted to larger works; purely professional agency works. The small works, if numerous, become difficult to control and work with efficiency.

Mr. Homan.—At the beginning of the famine, in order to give the people confidence, I think it would be best to establish a number of small works, situated so that no persons needing relief would have to travel more than ten miles from the villages in which they reside, and to pay most particular attention to the regular payment of those employed on them, which should, if possible, be witnessed by an European officer whose special, though of course not exclusive, duty it should be to travel from gang to gang and see that the coolies were paid on specified days and at specified hours, the days and hours for each gang being of course different. This work of merely witnessing and certifying to the payments might, perhaps with advantage, be performed by a civil officer.

Mr. Rundall.—All relief-works should be under the supervision and charge of the P.W.D., and, as far as possible, should be large works ; the only exception I would make is in favour of clearing village wells and tanks for drinking purposes, for which works a drought gives favorable opportunities ; these could be superintended by civil officers, and might be carried out by a class of laborers who would not, till the last extremity, go to the distant relief-works. These works should not be started hastily or indiscriminately. The large works should be first organized and started, and then a few selected smaller works to give relief to those left behind in villages, and there should be rigid drafting out from the smaller to the larger works.

Lieutenant-Colonel Prendergast.—Small works are admissible when there is general distress, and when this is fully developed, large works are by that time well in hand; those who are strong and can do a good task work there, and if there be a large work close to their village, and weak and sickly may go to it also. But if there is no large work within some miles, then the inefficient laborers may, with advantage, be admitted on small works near at hand. This holds good at such time as the famine is fully declared. A large work may be put in hand at the beginning of distress to give employment to all within some distance. But when the numbers are sufficient, then other works must go on as well; and the number of small works will depend a good deal on the professional agency available for supervision. The disadvantage of small works is that time is spent in going from one to another to inspect and check measurements; there must be separate minor superintendence, involving additional expense; there is more work in the account department checking calculations; there is trouble in sending to make payments.

Major Ross Thompson.—On earth and road-works the description of work should vary with the capacities of the people employed—strong men to use the pick, spade, and crowbar ; weaker men, women, and children to carry earth, break up metal, spread gravel, &c.

Small works may, with advantage, be undertaken under civil officers in the vicinity of villages, so as to keep a supply of labor on the ground to carry out the ordinary agricultural operations of the seasons. The rates paid on such works should never be high enough to attract labor from agriculture.

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Mr. Ricketts.—Small works are admissible in isolated localities, or where there is purely an agricultural population, as tentative measures, when famine is declining and there are but few to support, when there is likely to be delay in starting the large work and when such small works are really useful and calculated to be of permanent utility, also at times of sickness, and when there is risk of small-pox and cholera contagion by the congregation together of large bodies of persons.

In the beginning and decline of famine, small works appear to have the advantage; but at its height when civil officers are engaged in a multiplicity of duties, especially in seeking out distress, relieving it, or relegating it to works, to say nothing of the then heavy work of dealing with crime, then I think large works have a decided advantage. At the height of a famine the numbers of people resorting to works increase enormously, and then the trained organization of the Public Works Department in dealing with numbers comes into play.

I would here add that I consider there would be a serious defect in this trained experience if it proved incompetent, under the pressure of circumstances, to deal with the feeble, or to admit applicants to relief or to classify and gang them.

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Colonel Johnson.—I should consider small works admissible, 1stly, when large works are not procurable; 2ndly, when, owing either to paucity of numbers, or the weakly condition of the people, they would suffice for all requirement; 3rdly, when, owing to probability of rain or other reasons the ryots are unwilling to go far from their villages, and it is inexpedient to induce them; 4thly, when cholera or other contagious diseases are prevalent and it is undesirable to assemble the people in large numbers. Their advantages are that they are, as a rule, easily procurable, easily started, cost little, and can be stopped at a moment's notice, without entailing any great amount of loss. Their disadvantage is the difficulty of providing competent and trustworthy supervision for a number of scattered small works. A number of small works near together, such as a group of tanks, would be as useful as one large work. The larger works would, as a matter of course, be placed under Public Works officers when available.

QUESTION 4.—TESTS FOR ADMISSION TO WORKS.

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The three main tests hitherto adopted to justify the admission of persons to relief works are:—

THE DISTANCE TEST.—*Under which the need of relief is proved by willingness to go a certain distance to obtain it.*

THE WAGE TEST.—*Under which the need of relief is proved by willingness to accept a wage which is little more than a bare subsistence.*

THE LABOUR TEST.—*Under which the need of relief is proved by willingness to do a fair day's work according to the strength of the labourer.*

Would you propose to adopt any other tests than these? If so, describe them. Would you reject applicants for labour because their appearance, clothing, or the ornaments they wear, do not indicate penury? If so, would you do this equally at the beginning, during the height, and in the decline of a famine?

North-Western Provinces.—The tests are regarded as sufficient. One officer would add that of cooked food. Government are not bound to relieve persons who have any property left.

Bengal.—The civil officers would not add any test, and would generally reject the distance test. Engineer officers who have had famine experience in Madras are in favour of the distance test. Applicants should not be rejected because their appearance or ornaments do not indicate penury.

Bombay.—13 answers. The tests are considered sufficient as to the rest of the question. Opinions divided, but many officers would not reject applicants for work who are ready to submit to the tests merely because their appearance shows that they have some reserve of means. Those rejected for wearing ornaments will naturally return after leaving them at home.

Madras.—Twenty-eight European and 3 Native gentlemen have replied.

Opinions are almost unanimous that the three tests named are quite sufficient, and that all applicants who submit to them should be received on relief works, on one being rejected on the score of his being apparently well off.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Sandys.—No other tests are required. No applicants have appeared at any of the works in this district whose appearance, clothing, and ornaments they wore did not indicate penury.

Those who were well clad and had ornaments would in this district certainly dispose of their clothing and jewels, and live on the proceeds thereof before they sought employment on the works.

Mr. Cornwall.—I think there is no necessity for any more tests; and consider that all applicants for labour should be refused relief unless it is satisfactorily established that it is absolutely necessary to give them the means of keeping themselves alive. I do not think the Government is called upon to give relief to any person as long as he has a single pice left, or any property, except his ordinary clothes and cooking utensils. Ornaments ought most certainly to be parted with before coming to a relief work. It is assumed in the preliminary paragraph of Chapter III. that "the State is responsible for offering the means of support to all persons not able to provide for their own maintenance," and I certainly think that the tax-paying public is entitled to demand as a right that Government should not give the slightest relief as long as the applicant had anything he could sell or pawn. I should apply this principle throughout the famine.

Mr. Stoker.—Under the head of "wage test" I would insert payments in cooked food. This I believe to be a most valuable and crucial test. It will not, I think, be accepted by any but the really distressed *when accompanied by exaction of a full day's work.* It is open to the objection of being contrary to the prejudices of the people and offending caste scruples.

There is not, I believe, anything in the Hindu religion which necessitates such a test operation as an exclusion. No caste or clan need refuse food properly cooked and distributed by Brahmans. And if at the outset individuals be here or there found to prefer starvation, so much the worse for them. The State has discharged its utmost duty when it has afforded each individual a fair opportunity of obtaining subsistence. Government does not undertake to relieve its subjects on their conditions, but on its own.

The only other test I would propose is the workhouse test. This should involve residence within an enclosure, regular work, and rations of cooked food.

BENGAL.

BENGAL.

Mr. Worsley.—I would not adopt any other test than those mentioned in this question. I would not reject applicants under any circumstances. Decent clothes to the better classes are like cleanliness, &c. to ourselves. With their decent clothes they would put off their self-respect.

Mr. Magrath.—I consider the acceptance of wages, which only give a bare subsistence, a fair test. I would not propose any other test, as all those attempted have been perfectly illusory. I would not refuse applicants on account of their appearance. As a matter of fact they always pledge their ornaments before they come to work. The re-appearance of the ornaments, brass vessels, &c., and the appearance of better clothes, always show that the end of the famine is approaching.

Mr. Metcalfe.—I would not propose to adopt any other tests than those enumerated; and of those stated, I would adopt, as a general rule, no other than the labour test.

I would not reject applicants for labour because their appearance, clothing, and ornaments they wear are not indicative of penury; for this reason, that, as soon as it became known that decently clad persons would not be admitted on relief works, they would conceal and bury their ornaments and appear in miserable clothes and present themselves for work. Any restrictive order of this kind is sure to be met by subterfuge on the part of the labourers. In a country where grain is scarce, the possession of ornaments is no indication of the absence of distress in a family; for the reason that, if there is no grain, both gold and silver are useless; if there be grain, the holder of the grain is afraid to sell, for the knowledge that he possessed it would become immediately known, and his granary would be plundered and his house burnt. In the Poopree relief circle in Behar a Zemindar, who, in March, before the policy of Government was disclosed, vowed that he had no grain in his possession, was found subsequently to have in store the surplus crops of 17 years, and although he might have made a considerable profit by sale when rice was at 12 seers, yet was, through fear, restrained from even admitting the possession of grain.

Mr. Kirkwood.—I would adopt no other test than the three specified, namely, the distance, wage, and labour tests, and, out of these three, I would entirely reject the distance test, and boil the other two down till nothing is left of them but the very small, yet efficacious, remnant comprised in the two words "task-work." That task-work should be by the piece, so much pay for so much work. Task-work at the rates which I have already mentioned, namely (for Public Works Department works), ordinary rates until food is about two and a half times its ordinary price, then an increase of 25 per cent. in rates, and when the price of food is approximately quadrupled an increase of 50 per cent., while light-labour gangs should be paid at rates from 40 to 50 per cent. higher than those at the same time in force on the Public Works Department works, I should deem a perfect test of fitness.

I think rejection on account of the physical well-being of the applicant, or for the good clothing or ornaments he or she wears, to have, whenever tried, been condemned by results. From personal experience I cannot speak, but I think the chronicles of 1877 leave no doubt that such arbitrary rejection much increased the mortality.

Mr. Armstrong.—The distance test is, perhaps, the best of the whole—it proved so in Madras—especially if it is combined with the labour test. When the people do not object to the first, and accept the second, it may be safely inferred that the distress is real.

People apparently well-to-do should be rejected in the first stage of a famine, admitted in the second, and dismissed in the third. As regards the wage test on famine relief works, it is indispensable that the rate of wages be 25 per cent. less than the ordinary rate, otherwise people will be attracted from districts where famine is not raging, as there is always a considerable amount of labour ready to wander to any place where they know large works are in progress.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.—Certainly not. I would make the labour and wage tests quite sufficient to gauge the propriety of each application for work. Under this guarantee I should be glad to save the people from the necessity of selling or pawning their clothes or trinkets for petty advances taken at fearfully usurious rates.

BOMBAY.

BOMBAY.

Mr. Hewlett.—I think the State is not bound to maintain people who wear gold ornaments or who are able to maintain themselves, but I think also it is cheaper for the State if the mass of labourers have a little ready money of their own to fall back on.

Colonel Jenkin Jones, R.E.—No other tests suggested. The possession of valuable ornaments, which might be sold for the purchase of food, would be a good reason for refusing employment on relief works.

Mr. Propert.—The present tests are, in my opinion, quite sufficient. The distance test, while in some ways useful and likely to save Government money, may cause extreme suffering, and must, I think, be called a measure of severity. If the truth were known, it would, I dare say, be found that many lives were sacrificed by the fact of employment and succour being far away, in the case of those who refrained from leaving their homes till forced to do so by actual hunger.

I should certainly reject applicants for labour whose appearance, clothing, or the ornaments they wear do not indicate penury, unless the said applicant could satisfactorily account for his respectable appearance. I do not think that any particular stage of a famine ought to affect the rejection or admission of such a person.

Mr. Norman.—I can suggest no other tests than those suggested in this question. I would not reject applicants for relief because their appearance and clothes did not seem to indicate poverty. Such persons should be drafted into the labour gangs and a fair day's work exacted from them. The wearers of ornaments, if they possessed more than a nominal value, should be rejected. Greater stringency might be adopted at the beginning and end of a famine than during its height.

Mr. Spry.—I consider the distance, wage, and labour tests quite sufficient. Provided applicants submitted to the above tests, I most certainly would

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not reject them because their appearance, clothing, or ornaments did not indicate penury. I think it is most impolitic to strip a man to the very skin before he is admitted to relief; the consequence being that though he may not come for relief so soon, yet when he does come he is so beggared that on the termination of relief he has not the means of supporting himself. For instance, in the case of a small cultivator it is far better to let him keep a small reserve of his property, so that when the cultivating season comes, he can start afresh, than to make him dispose of everything so that he is unable to cultivate his holding when the time comes.

Mr. Charles.—I can suggest no other tests than those mentioned. I certainly should not reject applicants, if willing to undergo the tests, because their appearance did not indicate penury, for if a person is willing to go a long distance and live in an uncomfortable hut and submit to discipline which is always galling to the natives with their careless and unpunctual habits, it shows they must be in want of help, and it seems bad policy as regards the future to strip the people of all resources before admission, as the conclusion of the famine would find them helpless to get along during the few weeks till ordinary habits of life and work are resumed.

Mr. Moore.—I do not propose any other tests. I believe those mentioned to be sufficient. I would reject applicants for labour if their appearance, clothing, &c. did not indicate penury at any time during a famine.

Mr. Hamilton.—I think if people are found willing to come and work regularly throughout a season and accept the wages sufficient to purchase only that amount of food required to keep them in good health, the distance test might be disregarded, provided only that their work is too far from their houses to enable them to return after their day's work. All labourers should certainly be required to bring their families and live at the work. As to ornaments, I never found any labourers with other than copper imitation jewellery. But if any should be rejected on account of having valuable ornaments, they will merely leave them at home and come the next day without them. I should look at the fact of labourers working with ornaments of value on them as indicative that the wages were too high.

Mr. Percival.—No other tests are needed. No one should ever be rejected who submits to the tests.

Colonel Anderson.—No other tests than those named appear feasible. I would at no time give work to those whose appearance did not give reason to believe that they had not means of procuring subsistence from their own resources.

Mr. Robertson.—I would not adopt any other tests, but in every case the district officer should be doubtful about granting a labour ticket to a person whose appearance, clothing, or whose ornaments made his destitution a matter of doubt. He should promptly inquire into the condition of the person in question, and admit him if he should be found a fit object for State aid.

I would do this equally at the beginning, height, and decline of the famine.

Mr. Bosanquet.—My opinion regarding the distance, wage, and labour tests will be stated further on. I would never at any period of the famine refuse to accept any persons as labourers, whatever their appearance, if they were prepared to do a fair day's work for a fair day's pay.

Lieut. de Villamil. — If a cooly accepts famine wages, lives away from his home, and does a fair day's work *he is in distress.* This should be a famine officer's "definition" of a person in distress; exceptions will only prove the rule.

"Primâ facie evidence of distress" (the generally accepted first test, vide G. O. Madras, No. 2,847, of the 24th September 1877, sec. 21,) is an absurd test. Admittance to the work should be on "free trade principles," *i.e.,* without tickets from Civil officers; it should be on tickets *from the officer in charge of the work.* By all means let Civil officers search out and send people to the works, but their tickets should not be indispensable.

As this is entirely opposed to the views of the Bombay and Madras Governments, I will explain my reasons for this opinion:—

1st. Whatever the theory may be *practically* it is *not* universally known that Civil officers' tickets are necessary.

2nd. If a Civil officer happen to be 20 miles away from a work this order entails a march of 40 miles to qualify for admission; with a weak person this possibly might mean death, and would always be a very great hardship.

3rd. It opens the road for swindling or extortion. A cooly is on the work; the head cooly says, give me four annas or I dismiss you, *i.e.,* give me four annas or I cause you to lose two or three days' pay and to march 40 miles; the money is generally given; or a cooly requires work, and rather than go 40 miles for a ticket he bribes the head cooly to put him on the work, and is ever after in his power; of course he loses a per-centage on his pay.

The *theoretical cooly* would of course know the proper course to take in these cases, but I do not profess to deal with any but the unsophisticated cooly *as he is* and not *as he should be.*

I would not reject applicants because they had jewellery; it should not be the object of Government to reduce the people to penury before giving relief. A small piece of jewellery may be the means of saving a whole family from starvation; it will act as a "buffer" in case the arrangements for payment break down or are delayed. If jewellery be seen on a work, see if the three tests *are being enacted*; it seems, improbable that people with means will resort to famine works if the tests are rigidly enforced.

Mr. Keyser, Poona.—I think our system of relief was generally good, and there is no fundamental change I would advocate; but we improved as we went on, with increased experience, and our changes were in the direction of severity. At first people crowded on to the Civil agency works, and when we introduced the tests they fell off, which I take as a sign that they were not really in want.

MADRAS.

MADRAS.

Mr. J. G. Horsfall.—I do not consider that any other tests are necessary other than those of piece or task-work and wage test; *the distance test is objectionable as likely to cause the splitting-up of families and to foster the habit of wandering.*

No—not if they are willing to accept the conditions imposed. The mere fact that their appearance is such as to indicate that they belong to the non-laboring class points to dire necessity compelling them to come to works which they would never but for this do. Their clothes they must wear whether fine or coarse; and probably they could not sell them if they would. Jewels of course are different. It will, I think, be cheaper in the long run to allow such persons to obtain relief by work; if debarred on this ground they endure privation and starvation and become emaciated and unable to work and eventually a dead charge upon the State. The rule applies equally at the commencement and height of famine. At its decline they would naturally be the first to turn adrift. Indeed they would not need to be turned away, but would leave State work immediately when other opportunities offered.

Mr. Price.—I do not know of any other tests than those mentioned which, as tests, could be with any benefit employed. We tried in Cuddapah certificates of being in actual want of employment, which were granted by the heads of villages. These succeeded to a certain extent, but we afterwards found that they were made an article of trade and could be readily obtained on payment of 4 annas, and they were accordingly abolished. The test of whether a man was a puttahdar or not could not be fairly used. There were many people who had to come upon works who held puttahs of larger amount than the average, but who had been unfortunate in losing their cattle and in not having been able to cultivate their lands for want of rain, as was the case in the black-cotton-soil taluks of Cuddapah; but these remained, as a rule, only until rain came, and then left not to return. I would not reject any one on account of appearance, &c., without making due inquiry. A great many persons who ought not to have been taken on to works no doubt got on, but I have seen people wearing good cloths who proved to be really in want, the cloth which they were wearing being their last, and what had been, in better times, their holiday garment.

Mr. McC. Webster.—(*a.*) I would not propose to adopt any other tests than the wages and labor tests. I will give my opinion with reference to the distance test in answering.

(*b.*) I would not reject any applicants for work even if their appearance, clothing, or the ornaments they wear did not indicate penury. Relief works are not popular, indeed they are the reverse, and the "wages" and "labor" tests should be sufficient to keep away the non-necessitous. As regards their appearance—it is the object of Government to keep the people in health and strength, not to let them get emaciated and then send them to works. It has been our greatest difficulty to get people to go to the works before they became emaciated, and therefore it should be a matter for congratulation to find people in tolerably good condition coming on to works. The white cotton clothing worn by the people in this district is not any criterion of a man's circumstances; and even if a man on the works does happen to have a new cloth, I do not think this fact can be taken to show that he is able to support himself and his family.

As regards the ornaments—I doubt very much whether many people on the works have ornaments other than the "tali" and "koppu"—the one, the necklace, denoting marriage and corresponding to the wedding-ring; the other, the earring, almost invariably worn by females. I do not think Government should refuse to afford relief to persons until such ornaments are sold, any more than they should force women to sell their wedding-rings. In the very exceptional circumstances of a person being found on the works with other valuable jewelry, *i.e.*, jewelry worth more than a few rupees, I think some inquiry should be made before the wearers are turned off works. How can we tell that the man or woman is not keeping these jewels to sell in a more prosperous season to purchase ploughing-cattle or seed-grain? Perhaps their lands are waste, their cattle dead of disease, and they themselves on the works tiding over the time until a good fall of rain will enable them to plough their fields, and then the sale of the ornaments will provide the hire of bullocks and the seed-grain. I only give this case to show that persons wearing jewelry should not therefore be turned off or not to works.

Mr. Grose.—The three tests enumerated are the only ones practicable, and of them the distance test is so dangerous that I would exclude it, except at the end of a famine. No rule should be laid down as to refusing to give relief to the wearers of ornaments. The object of the State is to prevent people from being reduced so much that they will be unfit for work and probably die, and experience shows that in numerous cases great privations will be suffered before cherished ornaments are parted with. Nevertheless, the fact of the possession of ornaments will be a relevant fact in the inquiry conducted by the civil officer as to whether any particular applicant is a fit subject for relief.

Mr. Crole.—In addition to the tests named, I would have a "*presence on the works test.*" This is peculiarly required for laborers from towns and large villages, who, if not required to live at the work, resort to works near their homes and remain on them after the necessity for relief there has passed away. The existing rates enable a family to earn a relatively very high wage.

Mr. Martin.—I would not propose to adopt any other tests.

Men possessed of landed property may in a few instances come to work submitting to the tests, but they must either have peculiar relations to the land or have very heavy interests at stake which it will be better to allow them to protect than to turn them off work.

I would reject at the beginning and in the decline of a famine from both Public Works Department and civil works, persons who had *valuable* ornaments, but not those who have only trinkets of no value.

At the height of a famine, I would not reject persons for their ornaments, but I would provide them with the means of getting a fair price for their ornaments as I have mentioned in Question I. of this Chapter, and I believe that this will keep them off the works altogether if the distance test is properly applied.

I would reject persons from their appearance and clothing only when I was applying the preliminary test on a single work in the distressed locality. Once I had decided that severe distress was setting in and that works enough to enable the tests to be instituted were ready, I would reject no persons on account of their appearance or clothing until it was quite plain that the famine was over and that they could lead their usual life in their villages.

Mr. Austin.—The three tests are in my opinion amply sufficient. There is however one more test which might be applied, but which to my knowledge has never been tried, viz., the giving to relief coolies cooked food, condiments, &c., in lieu of money payment. There is one obvious advantage in this plan, viz., that no one would come to work for mere food who could possibly subsist in any other way.

The other advantages are (1) that the opportunities of swindling on the part of subordinates would be greatly reduced; (2) that the cooly would know exactly what he was working for, as there would be no fluctuations of payments as with the money wages.

In carrying out this system the greatest care would be necessary to see that caste rules were strictly attended to, and that the food intended for a certain caste was prepared only by men of that caste. It would be also necessary to see that the food was of the best quality to avoid complaints.

Lastly, a great point gained would be that those who worked would actually reap the benefit. With a money wage a large portion goes to idle and lazy members of the family who will not work for themselves.

It however cannot be denied that this test would be a most unpopular one. But this I consider is rather a point in its favor, our object being only to support those on relief works who are entirely unable to find employment elsewhere. I would reject applicants for labor at any period of the famine if they appeared to be obviously pretty well off. No hard and fast line can be drawn on this point.

Mr. Lee-Warner.—Emphatically I would reject persons whose appearance does not indicate penury in all the stages of the famine from small village works under Civil Agency. There are quite enough applicants for relief without them.

Mr. Knox.—The three tests hitherto adopted, viz., those relating to distance, wage, and labor are quite sufficient, I think, if properly enforced to prevent any but persons in distress from coming on the works.

2. I do not think that, at the commencement of a famine, people should necessarily be turned away on account of their dress or ornaments. These people might be equally in need of work to get their livelihood, and it would be rather hard to say to them, "You must try and sell your trinkets and put on a dirty cloth before we will receive you." It would be very easy for people to comply with these conditions, and if they do not do so, it may be because they have a little self-respect left. It would be an anomaly if a man was to beg having on ornaments and a good cloth, but it is not so when he comes and asks for work because he cannot get it elsewhere.

3. In the decline of a famine, however, I would unhesitatingly reject such persons being new comers on the assumption that if they had got through the worst of the famine without being obliged to apply for work and still managed to keep their ornaments and wear a good cloth they certainly must have some means of livelihood. Once the height of the famine was passed and things were looking brighter, the longer a man remained away from the works, the stronger would be the evidence that he would be able to last out the famine. On these grounds I would be more particular with new applicants of this description during the height of a famine than at the beginning, and would at least try and have special inquiry made into their circumstances.

Mr. Fawcett.—I would not propose to adopt any other test than the three given in the question.

Lieut.-Col. Prendergast.—When the distance test is applied, as well as the wage and labor test, I do not think any other is necessary. But when a work is opened close at hand, people who are not in need of relief will come to work. There should then be a poverty test. It will be difficult of application; but with the assistance of the Civil Department, some people would be set aside who were known to be not in real distress. People have applied for work in this district, close to their homes; on being offered work at a distance, they at once declined to go. Provided the three tests were enforced, I would not reject applicants for work, because their appearance or the wearing of ornaments did not indicate penury. I think a man might keep a pretty good cloth, and a woman some inexpensive ornaments, and not be forced to part with their last personal effects before being admitted to relief labor. Such people might be kept off in the early stage of a famine, but not in its height or decline.

Captain Awdry.—It is useless forbidding work to the well-dressed people who have ornaments as they would apply all the same, having left their clothes at home and buried their jewels.

Ruthna Sabapathi Pillay.—During the first stage, I think low wages may be made a test, this tending to bring the really needy only to work. This includes full task. In a couple of months, however, the test should be relaxed, and ordinary tests only employed. It is advisable in the first stage to reject men who have good appearance, clothing, and ornaments on. But during the second, and especially in the third and last stages, mere good clothing and ornaments grow valueless and cannot meet with purchasers. In such stages, therefore, it would not be advisable to reject them.

MYSORE.

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Colonel Sankey.—*Distance and other Tests.*—*General definitions.*—As defined "a man must work "at a distance from his house, not so close that he can "return to it every night.* . . . Every one who is "fed at a relief camp must sleep there." In his Excellency the Viceroy's minute of the 12th August it is observed that "the obligation . . . to go some "distance to work keeps from seeking relief people "who can support themselves otherwise." It was also laid down that "when a work is opened the officer in "charge should take over from the authorised civil "officer every man, woman, and child whom the latter "may send him for employment, *and should decline to take on any labourers not that sent.*"† Again, "as the object to be attained is the relief of the desti- "tute *not the profit of the well-to-do*, a scale of wages "will shortly be issued, and an entire stop must be "put to the system of petty contracts."‡ "As the "financial resources of the State are now tried to the "utmost, it will be necessary as far as possible to stop "all public works which do not meet the above "requirements (*i.e.* furnishing work for 1,000 people "for 3 months); and *you will therefore consider as "cancelled all assignments hitherto made.*" Further to enforce the principle that work would alone be given at relief-camps, it was ruled that "all open "kitchens at which paupers receive food which they "can take away uneaten, or which they can eat and "depart, must be abolished."* A few works which would be seriously injured by immediate closure were to be kept open, and even some under civil officers, to provide for not less than 300 labourers each, were also to be retained; but in both cases only to tide over the short intermediate stage before the system of relief, in its completeness as above indicated, could be introduced. Thus while by these arrangements persons arrived at a certain stage of emaciation or destitution, and who were willing to submit to the various tests, were alone entitled to Government aid or work, no able-bodied workman or—the so-called "well-to-do"—were to have any employment. The works giving them such employment were closed.

Impolicy of closing the works against the ordinary able-bodied coolies of the department.—It only requires a slight acquaintance with the circumstances of the native labourer to know that he is much oftener in the hand of the bazarman than possessed of any reserve of savings. It is true that those on the coffee and tea estates of Mysore, Coorg, and the Nilgiris always do save a large portion of their wages, and were at this time (September 1877) denying themselves the necessaries of life for their relations; but to term any of the class "well-to-do," on the commencement of a third year of famine, was surely to misunderstand the true position of matters, and to deny them work was to drive these men, who, of all others, by the good example they had set deserved encouragement, into

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* Letter from the Famine Commission in Mysore to the London *Spectator*, dated 28th September 1877.

† Officiating Chief Engineer's circular No. 20 of the 21st September 1877.

‡ Officiating Chief Engineer and Secretary's No: $\frac{1639}{2707}$ of 12th September 1877.

* Chief Commissioner's Order 25th September 1877.

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the ranks of the distressed. I fancy, if the truth were known, the only reserves which our ordinary coolies had were the flesh on their bones, and their determination to work for themselves and their families. It had all long been one of the main objects of the department to keep the really able-bodied employed—as not only maintaining themselves but their families—by the piece-work system.

Modification under practical application of the several tests.—In considering generally the subject of the tests, as applied in inaugurating the new *régime* in Mysore, I am unable to say precisely to what extent the order issued on the 12th September, practically dismissing all the able-bodied or "well-to-do" labourers, was modified by experience, but apparently the error was soon recognised. By the Famine Code issued by Mr. Elliott on the 2nd October 1877, we find it laid down in the opening paragraph that, "in the present "state of this province (Mysore), it is not intended, "until a crop has been harvested, that any applicant "should be rejected on the ground of his being well-"to-do, provided he submits to the three tests,"—viz., those for (1) distance, (2) wage, (3) task. The closing of Budget works as directed, all over the province, must have had a serious effect on the able-bodied bread-winners, and it is therefore difficult without further information to know how this modification of the original order practically afforded relief, or rather diminished the hardships of this class. Judging from the increased numbers shown by the returns to have been employed, subsequent to the 8th September, on works under the civil officers, it may be presumed that, all these being of a petty character and close to the homes of the people, the so-called distance* test was found unsuitable, and partially, if not wholly given up.

Practical abandonment of the several tests.—The wage and task tests, as elsewhere shown by the order of the Famine Commissioner, on the Timmenhuli tank, and subsequent departmental instructions to the superintending engineers, were also abandoned as impracticable; but these, like other matters, will be best established by local inquiry.

Major Scott Moncrieff.—At no time would I reject applicants for labour because from their appearance they are not in want. It is of great importance not to let people run down from the full strength from which can be demanded a full task to the reduced strength from which little or no task can be demanded. With able-bodied labour on good works the State invests largely, and gets a return for its money. Surely this is better economy than spending if it be even only half the amount on relief yielding little or no return. Appearances are not safe guides, and a man or woman may look in tolerably easy circumstances and yet be very poor. Who is to decide?

Mr. Ricketts. — Appearance alone is deceptive. Decent clothing is often a sign of good economy, and the wearer may in reality be no better off than a person in rags, and I would preserve the self-respect indicated by clothing as compared with rags *alias* semi-nudity. The question of ornaments is more difficult. If applicants are rejected on this ground, they will remove their ornaments, and they may then get lost or stolen, which is a loss of material wealth. Besides, such ornaments may, in fact, represent the sole capital of the wearer as carried on the person, and may be turned to account hereafter on return home, illness, or during the trying interval of sowing and harvesting of the crop. I, therefore, consider these tests of non-penury as rather delusive and extremely easy of evasion.

Colonel Johnson.—The distance test is only admissible in the case of malingerers and skulkers, people who are able to and will not work. If it be decided that these people can neither be made to work nor allowed to starve themselves, matters should at all events be made as uncomfortable for them as possible. For people willing to work, the nearer the work can be brought to their homes the better, always provided that suitable work can be found in the locality. Failing this, as stated above, they may fairly be expected to go to a distance. The idea of rejecting an advantageous work because it is too close to the locality to be relieved, or of purposely making the labourers march several miles to and from the work every day, should not be seriously entertained for a moment.

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QUESTION 5.—THE DISTANCE TEST.

The Distance Test.—State how this test has been applied within your experience of famine, and how you think it should be applied. What amount of distance has been considered sufficient for the test? Was it enough that the labourers should have to go some distance to and from the work? Or was it insisted on that they should live away from their homes? If A is a work near village Z, and B is another work 10 miles off, have the inhabitants of Z been refused admittance at A and directed to go to B? If so, what measures were taken to ensure that they did go to B? If the test has been relaxed, state under what circumstances. Has the test been effectual, and has it kept away persons who were not in distress? Has it been too severe and kept away people who were in distress? What modifications would you, from the experience now gained, propose in applying the test?

Punjab.—Distance test regarded as most crucial, but there has been no experience of it in the Punjab.

North-Western Provinces. — Opinions divided. Many officers view the distance test with disfavour and think it sufficient to take care that large works are placed far from centres of population.

Bengal.—The distance test was very little used in the Behar famine. The opinions of the civil officers are much opposed to it. Some of the engineer officers who were sent on relief works in Madras are in favour of it.

Bombay.—11 answers. Opinions differ. One or two officers are opposed to the test; others approve of it as effectual in keeping off persons not in distress, and do not think it cruel if worked as directed by the Bombay Government "in a reasonable and discriminating manner." It was applied to send the people from 10 miles to longer distances from home. It is considered sufficient to send them so far that they cannot return at night.

Madras.—To this question 37 European and 4 Native gentlemen have replied.

Opinions are divided. A majority find advantage in the distance test (if not too severe) in keeping people not in real need off the works, especially near large centres like Bellary. It is suitable also for professional labourers, who should be housed on the works. Those opposed to it state the disadvantages to be that it keeps away people really needing relief, and hinders the cultivators from returning to their fields when rain falls, breaks up families, and encourages wandering.

PUNJAB.

Mr. Nicholl.—Of the three tests, this is the most crucial; people who are not in real distress will not travel long distances from their homes in search of work, on which they only hope to receive a bare subsistence. I have known whole families to travel 150 miles to works that I have had charge of, because no work was to be had nearer to their homes.

It is not enough that the labourers have to go some distance to and from the work.

The application of this test in the sense implied in the question has never been attempted by me.

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Major Jeffreys.—The distance test as exemplified in the only work with which I am acquainted has proved singularly fruitless in results, the parties in every case deserting after having been brought by the tahsil peons. The distances travelled were 40 to 50 miles. In those cases when the distance did not exceed 15 miles they stayed. My opinion is that this distance is quite sufficient for the test, and should not, if possible, be exceeded. They lived on the works, and did not return to their homes, except at long intervals, and for a day or two only at a time.

The place I refer to where "the distance test proved fruitless" was "Shikohabad," in Mainpuri district. Between the 16th and 24th May 1878, 2,271 paupers in daily parties numbering from 300 to 800 were sent by the Collector of Agra, a distance of nearly 40 miles, under the guard of tahsil peons and chaukidars. They took four days or so over the route, the last march taking them into Shikohabad city. On the following morning they were taken out a distance of only two miles to the work, which consisted in excavating a canal. The subdivisional officer in charge, who was officiating for the Executive Engineer while absent on sick leave, gave them only a half task consisting of 27·5 cubic feet. To this they loudly objected, saying that they would work by daily labour, but that they would not consent to have their tasks measured. In the evening they bolted, and did not wait till the second day. This occurred five or six days successively with each set of paupers that arrived. At that time, as Superintending Engineer of the circle, I was absent on leave. After my return to duty I investigated the case as well as I could, but as the importation of fresh parties from Agra had been suspended, it was not easy to arrive at any definite conclusion.

The subdivisional officer in charge declares that, instead of the distance test having failed, it would be more correct to say that it had perfectly succeeded in its alleged object of proving the fitness or otherwise of the applicants for relief by their willingness or unwillingness to travel a certain distance to obtain it. There is no doubt that no willingness of any kind was displayed by these men to leave Agra. They were forcibly sent by the Collector under the escort of tahsil peons, and when they found on arriving that their work would be measured, they rushed back to their own city (Agra), where they knew the Collector was bound to provide for them somehow.

This was the explanation given by the Officiating Executive Engineer in charge to account for his inability to detain these deserters, and I could find no reason for disproving his statements, which were additionally confirmed by the fact that a party of upwards of a hundred paupers from pargana Bárah (only one day's march) stayed and submitted to the conditions of task-work imposed. These men were really in an emaciated condition, and showed unequivocal signs of having suffered privation and want. The men sent from Agra, on the other hand, were said by the officiating divisional officer to have been in good physical condition, and to have showed no signs of starvation.

Mr. Muir, the Joint Magistrate of Mainpuri, was present at Shikohabad all this time, and gave the divisional canal officer the benefit of his assistance. He entirely confirmed all that the latter had said.

The only conclusion, then, which could be arrived at was that the distance test was in itself too severe, or that the recipients were not in sufficiently distressed circumstances to avail themselves of relief under the conditions required of them.

Later on in the season the experiment of importing paupers from Agra was resumed. As a preliminary measure, a change was made in the management of the work by recalling from sick leave the substantive Executive Engineer of the division, who was away when the previous desertions took place. The paupers were forcibly seized and stuffed into special trains under tahsil guards. So unwilling were they to go that they tried to get out of the windows of the train while in motion, thereby causing the railway officials much anxiety and trouble. This fact having been duly communicated to the canal divisional officer, who was warned that these paupers must be detained by all legitimate means, the only thing left him to do was to treat the new arrivals with more than ordinary leniency. For the first three days only nominal work was exacted in the shape of completing the hutting arrangements. It was some time before anything like a task could be exacted from them. Ultimately they gave from 20 to 25 cubic feet per diem, earning about 1 anna 1 pie per head on an average. By this treatment they were induced to stay. I am bound to say that they contained a number of sick and weak among them, and that they all showed signs of having undergone privation and want, and in this respect I understand that they formed a contrast to those who came in May.

In the later experiments it will be seen that the paupers were retained, and that no desertions of any importance occurred. How much of this is due to change of management, and how much to the distressed condition of the relief recipients as compared with importations of May, can never be said with any certainty; but there is no doubt that, when paupers are forcibly seized and sent against their will long distances, they will not work readily or consent to remain unless they are treated with a leniency that is not contemplated in any famine code.

The works at Narora in August and September 1877 were not famine relief works strictly so called. While serving a secondary purpose of affording relief to the people who at that time were deprived of their ordinary avocations through drought, the primary object was to excavate a certain quantity of channel in the space of two months, so as to allow of a volume of water being admitted through the Lower Ganges Canal channel into the existing terminal branches of the old Ganges Canal, which the new canal is designed to feed.

In less than thirteen weeks 228 lakhs of cubic feet were taken out of the canal, inclusive of 40 lakhs clay puddle revetting (which last is a laborious process); and when it is borne in mind that this had to be raised 20 to 40 feet and carried 400 feet, it will easily be seen that such results could never be effected by ordinary famine relief agency, exacting from famished coolies the usual daily half task. It could only be done by getting double and treble work from the parties employed. The work was let out to petty contractors at 25 per cent. in excess of ordinary rates,

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and on condition of doing a certain out-turn within a specified time. To induce their earth carriers to do extra work, the contractors employed the cowrie system, and the consequence was that the labourers worked harder than I have ever seen them do before or since. Under such circumstances of course an able-bodied man was able to earn 3 annas and 3½ annas per diem. It will readily be seen that so large an out-turn could never have been done within the time specified except by the inducements held out to them. The coolies were well paid, but they worked hard for it.

There was no doubt as to the popularity of the work. People swarmed from all the neighbouring villages until the numbers swelled to 20,000 or so in a distance of 25 miles. (Grain at that time was selling at 9 seers the rupee.)

Why, then, it may be asked, did the 1,450 men sent by the Collector of Budaun return to their homes dissatisfied with the system in force? Clearly it cannot be wholly due to the system, or else why should the 20,000 men from the neighbouring villages have come so eagerly and worked so well. The strangers were treated on the same terms as the residents by the contractors, whose only desire was to get the largest possible out-turn. It can only be accounted for by the supposition that they found the distance test too irksome, especially as they were sent more or less forcibly by the Collector of Budaun under an escort of tahsil peons, &c. I dare say if the residents of our villages had been forcibly sent to Budaun they would have left on the first opportunity, whatever the nature of the work may have been.

It may have been that these men were not suffering to any marked extent from want. They may have been willing to receive relief near their homes, although they would not go a distance to procure it. There are occasions of men coming with their families from long distances to find work. They do not arrive in large bodies, but singly. I have never heard of such men deserting; in fact they always make the best famine labourers. Between such men and the large bodies compulsorily sent by magistrates under guards, like so many animals, there can be nothing in common.

Mr. Colvin.—No distance test has been applied. I do not believe the distance test is workable here with large numbers. As soon as the labourers learn the trick of it, no one will allow that he lives within the prescribed distance.

Mr. Tracy.—The distance test has been applied only partially in this district. The relief works were too much scattered. People are generally willing to walk a distance of four to five miles to the works. The labourers have been allowed to live at their homes, or to remain at the works, as they pleased.

In the case put in the question, the inhabitants of Z have not been refused admittance at A. If they had been refused admittance, they would have gone away and returned to A, representing that they came from a distance. It is practically impossible to check their statements. The test is a very unsatisfactory one, and all but impossible to apply in practice. The general principle appears to be that large works should not, if possible, be opened near large centres of population.

Mr. Leeds.—The "distance test" is, I consider, a very important one, but I have never seen it effectually carried out, and where the distress is widespread and relief works numerous, do not well understand how it could be. Of course if the distress were confined to a small area, it would be easy to apply the test by providing relief works at a certain distance from that area, but where a number of adjoining districts are equally suffering, and relief works are being carried on in each of them, I do not see how it can be certainly ascertained whether the labourers on any particular work come from the immediate neighbourhood or not, that is to say, if the rule of exclusion or transfer has ever been put in force, and the labourers have a sufficient reason for concealing their place of residence. Anything like inquiry, where the numbers are so great and the need urgent, is clearly out of the question.

The only workable distance test, in my opinion, is that which operates naturally, and consists in removing relief works as far as conveniently possible from the great centres of population.

Mr. Lawrence.—In Agra it was found that the wives and children of labourers in ordinary employment in the city flocked to the works, although not by any means in actual want. To obviate this a relief camp was formed on the other side of the river, and labourers were paid in a currency (zinc tickets) which could only be cashed in the camp, where the labourers were compelled to live. This plan eliminated all those who were not in actual distress. When the relief work at Agra was reduced, labourers were despatched under charge of their overseers and mates, aided by one or two constables, either by road in two stages to railway works at Parkheru, 30 miles off, or by rail to the canal works at Shikohabad. The test has on the whole been effectual, though it may have operated severely in some instances. The remaining work at Agra was done as much as possible by people from a distance, the Agra poor being sent away.

Mr. Wall.—I found the distance test an excellent means of distinguishing the really indigent from the mock indigent. The latter, especially women, used to crowd the Túra embankment works (which were about 20 miles east of Bánda) when cash wages were in vogue. The substitution of cooked mahua lessened the crowd, and once a week or so the strongest looking of the relief labourers were told off for transfer to the works at Bánda city (Keyn-crossing embankment), and the result was that generally from one-half to three-fourths of the draft disappeared during the night and never returned. It is not I think sufficient that the labourers should have to go some distance to work; they should be obliged to leave their homes *for good and all*, day and night, or the test will not work in its full efficiency. I have only applied the test to able-bodied men. At first villagers of Z were allowed to work at A. Then gradually the best of them (physically) were told they would have to go next morning in a gang under a chaprassi to A. Most of them used to disappear during the night, and the remainder were sent off with a chaprassi to A. I found the test most effectual; I never had occasion to relax it. I would only apply it to men in good physical condition, to whom the march would be a matter of no difficulty.

Mr. Quinn.—I think that, ordinarily, the wage test and the labour test are sufficient, and that the distance test should only be employed at the very beginning or very end of a famine, especially the latter. I should not even then apply it rigorously so as to exclude those who lived in the neighbourhood, but I should close the relief work near where most of the labourers lived, and open or retain another at some distance. This was done at Hardoi at the close of the famine.

Lieut.-Col. Chamier.—The distance test has only once been tried in this district. In the early part of August orders were received to transfer 3,000 labourers from the Sutrik relief work to Buddu Sarai, a distance of 24 miles, but only 1,040 arrived. Some returned to Sutrik, and were taken on again as they were manifestly in want. From this little trial I gather that the distance test should be applied when work in another district is available; and secondly, that the work from which the men are drafted should be closed. But another consideration forces itself on me. It is undeniable that labourers prefer working under Shadi Lal at Sutrik to working under Mr. Rose elsewhere. I am not prepared to state what the true reasons are; but, naturally, one would be that labourers will flock to those works where the supervision is lax.

Mr. Blennerhassett.—In the relief works opened after the rabi harvest was disposed of, the distance test has been more or less applied, the works being sometimes 25 miles away from part of the distressed portion of the district, sometimes 10 or 12 miles off, and occasionally close to one distressed part though far from another. The works were not sufficiently numerous to carry out the test to its full extent by refusing admission at one work and granting it at another.

The labourers in general live on the works, their homes being too far to visit. A moderate distance appears to act favourably in deterring undeserving people from coming to the works. There is, however, undoubtedly, danger in making the distance too far; rumours start over the country that paupers are being gradually sent to distant stations and districts, and, hearing this, they prefer to die at home. A moderate distance in general between 10 or 20 miles, appears to be desirable; if too far, the test undoubtedly becomes too severe: much care is necessary on this point.

BENGAL.

Col. Burn.—In the works we undertook, and all of which are on official record, we did not establish any distance test. We had large works and small works, and each man went to the one he could make most at. We did not try to keep away people from work who were not in visible distress. We gladly welcomed fat Brahmins, though very few appeared, thinking they set a good example to their caste by getting them to work instead of begging from their poorer and lower caste neighbours.

Mr. Magrath.—This has never been employed where I have been, and must be perfectly illusory, because by the time that the people are sufficiently well known to make the application of the test practicable their circumstances would also be known, and they would be refused work if not proper objects of charity.

Captain May.—Works were so numerous in this district, and were given so near to all who needed it, that the distance test was not applied, except when Sir Richard Temple requested me to urge as many people as I could to go to Arrah to the canal works. They were offered liberal inducements; but, owing to their entertaining some suspicion of being sent beyond sea, I was only able to persuade 30 to go, although I assured them that not a single man would be sent beyond Shahabad district, and that I would forfeit my life if a single man were. I have no doubt that, if all work for the able-bodied had been stopped here, a large number would have found their way to Arrah. In order to apply the test, or gauge the extent of distress, I would start a few works some 20 miles apart from each other on the task and piecework system, and see from the registers kept in each work how many of the cultivating classes other than Nunias and other diggers resorted to them. Nunias go a long distance in ordinary times to obtain employment on canal or other heavy earthworks.

Mr. Hodgkinson.—To the distance test I am strongly averse. I can conceive no circumstances likely to occur under which such a test becomes absolutely necessary, and without absolute necessity the loss of labour it involves is not justifiable. Withdrawal of people to a distance from their homes may be unavoidable; but an unavoidable defect should not become a test. The wage-test and the labour-test are, I believe, quite sufficient if properly applied. I would turn no one away from a relief work. Appearances are very fallacious; and if proper tests are rigidly applied, few will come to work for a mere subsistence if not driven to it by circumstances.

Mr. Finucane.—The distance test was not applied in my experience of famines.

Moonshee Ishree Pershad.—Road works of large scale were opened in Madhubani subdivision under officers of Public Works Department. As long as these works were within three or four miles from certain villages, the inhabitants with their families worked in them willingly; on the works being removed to greater distance, only the strong members of the families followed the road works, and their families, consisting of old persons and children, left them and assembled at the nearest tank work. Ten miles distance was considered sufficient for the test; it was not insisted on that labourers should live away from their homes, nor were they refused at the nearest works in order to go to distant work; the test was relaxed when the relief work at Mirzapore in the Madhubani subdivision was overcrowded by applicants. Mr. Metcalfe and some engineers had occasion to go to the place and make some arrangements. The test had proved effectual and had kept away persons who were not distressed; it had not proved very severe, because those who could not follow the road works and were really in need of relief were admitted in tank works under civil officers who could easily ascertain their conditions.

In applying the test of distance it is necessary to employ *mates* and burkundazes of the neighbourhood of the place where the work is going on; they could form groups of labourers well with regard to the distance of their homes from the works.

Mr. Metcalfe.—In the Behar famine no distance test was applied, but the labourers were confined as much as possible within their own circles. So far from encouraging them to go to a distance, every endeavour was made to employ distressed persons locally in the vicinity of their own villages, for the reason that circle officers were better able to decide on the condition of villagers, when the inquiry was made in the vicinity of their own homes, whether relief works should or should not be opened; and as soon as the first favourable signs showed themselves these works were discontinued. If a distance test is enforced, labourers will, by making inaccurate statements, and giving a wrong description of themselves, obtain employment, from which under the rules they would be barred. When labourers were drafted from one work to another their names were struck off the *haziri* rolls, and information was sent to the officer of the circle to which these men belonged that the workmen had been struck off or ordered back to their homes. My experience is, that daily wages, if fair wages, demoralize labourers in times of famine; or, if the wages be a pauper dole, it is cruelty, for the man cannot buy sufficient food for himself and his family on a bare pittance in famine time. The less food he can buy, the less physical strength he has to labour, and the less work he can do. I am wholly opposed to any distance test being applied in cases of a severe famine.

Mr. Kirkwood.—I am glad to say that I have no practical knowledge of the distance-test; but this much I can say from my practical experience of famine administration—such a test must leave unrelieved many deserving of relief, and must mean serious mortality, unless there be a perfect system of village inspection and a lavish expenditure on gratuitous house-to-house relief for persons who would willingly work if only the necessary facilities were afforded them. I cannot imagine a condition of things where adherence to such a test would not, in a great measure, render futile the utmost exertions to save life among the many who would certainly refuse to submit to it; and would not, at the same time, unnecessarily cause among those who consent to submit to it a disintegration of homes, an amount of vagrancy, an increase in crime, and a heavy mortality from exposure and the trying incidents of such an unaccustomed life.

Mr. Kisch.—In the Behar famine I had charge of a famine circle at the north of the Mudhubani subdivision of the Tirhoot district (now Durbhunga). I joined my famine circle in March, and there were then no relief works in the circle, and the people were suffering severely. There were relief works outside my circle—twenty-five miles at least from most of the villages. Most of the people did not know of the existence of the works, and those who did know of them did not go to them. Grain was selling at about 10 seers for the rupee, and from the condition of the people I am satisfied that, had relief measures not been organized for the circle, many persons would have died instead of going to the works 25 or 30 miles distant. At that time, however, relief operations were only commencing, and I have no doubt that, had the villages been frequently visited, and had the people known where to find work, they would have gone to the works that were then open. As soon as the district was divided into famine circles, numerous small works were opened, so that almost every village in my circle was within two or three miles of a work. From March till the close of famine operations in my circle I had no experience of the application of the distance test.

I would commence operations in the distressed districts by having one large work for as nearly as possible every thousand square miles. As the distress and the demand for work increased, I would open more works and arrange as nearly as practicable to have one work in each area of 500 square miles. A canal or railway work passing through several work areas would of course be regarded as providing a separate work for each area through which it passed, and no other work would ordinarily be necessary. There being at the beginning of the famine only one work for each tract of 1,000 square miles, and afterwards only one work for each 500 square miles, all applicants for labour who did not live in the neighbourhood of the work would be subjected to a distance test, more or less severe according to the distance of their homes from the work. I would not attempt to apply the test in any other way than that now proposed. If the works became overcrowded owing to the severity of the famine, it might be necessary to have one work in every 250 square miles, or if very large works were not available, one work for every 100 square miles.

Mr. Armstrong.—The experience of Madras goes to prove that people willingly came daily from six to eight miles distant, returning again to their homes, and when ordered to go to another part of the work five or six miles off, went without complaint. Huts were provided on the work, and they were given the option of staying or returning daily to their homes. As a rule, when the work was over six miles distant, they preferred living in the huts. Many people, also, came from great distances, and lived in the huts. I would not relax the distance test, but it would be always advisable for the officer in charge of the work, or some other, to go round the distant villages, and notify himself that work was to be had at such and such a place, and that huts were found, bunniahs' shops opened, &c.; as people in out-of-the-way villages are timid, and, suspecting hearsay, will have every confidence if a Public Works officer goes to their villages and assures them that they will be well looked after.

Mr. Hughes. — When I first took charge of the Dūrampury taluq, I found from 3,000 to 4,000 coolies (I am not sure now of the exact numbers) employed in collecting road-metal on roads close to their houses. They were for the most part stout, healthy-looking people, and they had gained admittance to the work through the laxity of the native subordinates. With the assistance of the relief officers we turned off the able-bodied, and gave them tickets of admission to some works about 15 or 20 miles off. Our numbers at once fell to about 700 or 800. On another occasion, in consultation with the relief officers, we tried to march a large gang of about 2,000 coolies employed near the town of Salem a distance of 10 miles. The coolies refused to go, and we closed the work. I have already said that I consider the distance test to be the keystone of efficient famine relief administration. There are few years in which plenty of coolies cannot be found willing to work close to their homes; if they have nothing to do in their fields, in real distress they will always go one or two days' march from their villages. I would fix the greatest distance at 25 miles and the least at 10 miles.

If the officer in charge of the work has the confidence of the people and proper arrangements are made for feeding and hutting, I think there would be no difficulty in marching coolies longer distances, of 30 to 40 miles. I would propose no modification in this test, except to emphasize it more strongly, if possible.

Mr. Brookes.—The distance test is not easy or always satisfactory to work. When labourers are hutted on the works, they think nothing of being 50 miles or more from their villages. They could not be compelled to walk to and from the works any distance each day; neither would it be any advantage if they would, as they would only do the less work. The test utterly failed in Madras when labourers were brought hundreds of miles from Cuddapah, Bellary, and Kurnool to the East Coast canal at Nellore. They deserted by thousands immediately after, although they were proper subjects for relief and the remuneration they were receiving was ample.

Subordinates who receive applicants for employment have not the means of finding out where they come from, and relief coolies soon learn to invent the story that secures to them the lightest and most profitable employment. The test is useful in arranging that work shall not be too inviting. Persons who are not in much distress will not leave their homes when the work is at an inconvenient distance.

I have not known of the test having been found too severe, except in the case in Madras already referred to.

Mr. Abbott.—All large gatherings should be avoided, not only from fear of cholera and other diseases, but because the numbers become utterly unmanageable. Wells and tanks, as a rule, the Zemindars and ryots themselves keep in sufficient repair, roads are for all purposes efficiently looked after by the local Ferry Fund Committee, and works of much greater utility can be found in each village. No Zemindar or ryot pays the slightest attention to sanitation, and the earth for each mud house in a village is invariably dug out from close alongside, the excavation forming a receptacle for every description of filth and refuse. Wells are as often as not within a few feet distance, and are of course the drains for these hot beds of disease, the filling up of which would not only find employment for the distressed, but do much to check future pestilence. Drains round villages might be dug with advantage, being another work the native will never do for himself. Both these works can be easily tested, all earthwork being gaugeable by measurement; and if the officer has been furnished beforehand with a list of people necessary to relieve, he can easily calculate the amount of grain required for each village.

Where large gatherings are inevitable, the best work to turn the people to seems the bunding in of rice lands and cutting of irrigation pines to contiguous rivers or jheels, as although these are such very necessary preventives of failure of crops, it is a most difficult thing to get Zemindars and ryots to combine to execute them in seasons of plenty, and its chief advan-

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tage would lie in Government being thoroughly justified in making both proprietor and cultivator repay a considerable portion of the outlay by instalments on future crops; the labourers too could be dismissed early every evening.

Baboo Hari Mohan Chandra. — I was a relief officer in this district in 1874. At the first stage of the famine I gave the applicants work close to their homes; but when the works close to their homes were finished, and the number of applicants increased with the increase of the distress, I opened works at 12 or 15 miles distance from their homes, where they went without reluctance and worked. No compulsory means were needed; they went of their own accord. In my opinion the distance test should not be applied at the beginning of the famine; when the number of applicants increases with the increase of the distress, the distance test should then be applied. The people of this district are so averse to leave their homes that I consider a distance of 15 miles a quite sufficient test of their need. My labourers used to stay six days in a week away from their homes, and on the seventh day they used to come home once, and again go back to their work. They had made huts by the roadsides to stay there and work. The members of each family had a hut of their own. The labourers were never compelled by me to go to a distance and to stay there, leaving their homes; but they were compelled by their own need to go to distant works and stay there and work. I strictly enforced the labour test, which I think was quite sufficient to keep away persons who were not in distress.

BOMBAY.

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Mr. Hart.—The distance test was only effectual when living away from their houses was a necessary condition.

The distance test, when too rigidly insisted on, was at times too severe; one or two days' journey of distance was sufficient to reduce the gangs often 75 per cent.; the people went perhaps the first stage, received food, and then deserted, only to return to the original relief centre when forced by hunger, and therefore in a less physically fit and deteriorated condition.

Colonel Jenkin Jones.—Employment was refused to able-bodied people within about 10 miles from their houses. In the Poona, Sholapur, Ahmednagar, Nasik, and Satara Collectorates, as soon as the large irrigation works and the Dhond and Munmar State Railway were started, the able-bodied people employed on the roads, &c. were drafted to them. The distance test is a very admirable one, but care should be taken not to press too hard upon the weaker persons, in whose behalf minor works should be kept open in the vicinity of their villages.

About ten or twelve miles was thought sufficient.

It was compulsory that they should be employed sufficiently far from their homes to prevent their returning at night.

Inhabitants of Z were refused at A, with the exception of the weaker persons.

A register was kept of the persons ordered to B, in order to prevent their finding employment elsewhere.

I have no modifications to propose, except, as I have above stated, that discretion should be used in dealing with the weaker applicants for relief.

General Wilkins.—The distance test was applied generally all through the Southern Division during the late famine, and with the best results. The minimum test of distance is where the famine labourers are unable to live at home to proceed to work in the morning, returning home again at the close of the day. When works are a few miles away, the villagers will return home, and the labour test is in such cases very severe without producing any compensating result.

The distance test in the Southern Division varied from a minimum of six miles up to 20 miles. Ten miles was the usual minimum.

Without the distance test I fully believe the numbers on the works would have been more than doubled. The test, therefore, has a very favourable side, though as usual there is a reverse to the medal.

By the exaction of the distance test, many people requiring relief were forced to forego such relief. They had aged relatives at home they would not abandon; they had a few cattle or a cow they could not leave in their villages without some one to take care of them; and other similar causes drew them away from relief.

Then, when village inspection became necessary, many people were found in great extremity and want, who, but for the application of the test, would have retained their condition.

In the interests of the State, however, the application of a distance test must be enforced.

The inhabitants of Z have been refused admittance on the work A, and have been directed to go to the work B.

The distance test was relaxed in the Kaladgi district for a short time at the height of the famine, owing to some order received in the Civil department. The works were immediately, I may say, swamped with people, and the Public Works officers were nigh overwhelmed. The test was put on again, and the pressure ceased.

Mr. Propert.—The distance test was not applied in the case of Khandesh, as the relief works were fairly distributed about the province, and the numbers resorting to each were never sufficiently large to render special tests necessary. As stated in the last answer, I am of opinion that the distance test may become a cruel measure. In times of famine I consider that the mere fact of large numbers of persons resorting to large, strictly conducted relief works, on which the lowest possible rate of wages is given and a fair task exacted, proves that those persons actually require employment to prevent their suffering from hunger. Under these circumstances, as Government admits its responsibility for the lives of its subjects, I am of opinion that the distance test should be abolished, or its application considerably modified.

Mr. Norman.—In this district the distance test ordered by Government was twenty miles, except in certain special cases, such as the residents of villages near the Dhond and Manmad State Railway. As far as possible, it was insisted on that the labourers should live away from their houses. It was found very difficult to carry out this arrangement, and the system was not in proper working order until nearly the end of the famine. In the case referred to, the inhabitants of Z would have been ordered to go to the work at B, and if the journey was more than a day's march, they would have been provided with food *en route*. No measures were adopted to ensure that they would go to B, and the majority usually refused and returned to their own village, where they remained until distress again compelled them to apply for relief, when the same process was gone through again. This test of distance undoubtedly kept many persons off the works who were not in distress. I do not think it has been too severe; the only difficulty lies in providing a sufficient number of works. It is almost impossible to persuade people to move more than two or three days' march to a relief work, though they often wander hundreds of miles of their own accord.

Mr. Spry.—The mamlatdars and other officers were entrusted with the duty of sending applicants to certain works named, and they had to see that these applicants were not sent by them to works close to their homes. Then again when there appeared reason for supposing that the people got on to work close to their villages, by passing themselves off as inhabitants of distant ones, the whole gang or gangs would be removed to other localities. The above are the only ways, as far as I know, by which the distance test can be applied or should be. About 10 miles was considered generally sufficient for the test, though at times, for special causes, such as the closing of some works and the opening of others, longer distances had to be given. Applicants could not be entertained on works unless they brought "chits" from specially appointed officers. The inhabitants of Z would get "chits" on work B which would admit them there, but not on work A. It rested with them whether they went to B; we could only prevent their going to A.

In cases where the applicants were in bad condition and required what was termed "special treatment," no test was exacted, but they were sent to the nearest Civil work where "special treatment" was given, and that might be close by. The condition of the applicants was sufficient evidence of their requiring relief.

The test certainly kept away people not in distress. As to its severity, people really in distress were generally willing enough to accept it, a certain class excepted, who, although in distress, would not go to any work unless at their very house doors. For such obstinacy there was no cure which would not lead to demoralization. It is sufficient to apply properly a mileage rule about distance test, and I think it is quite enough that people should be so far from their homes that they cannot return to them at night. Once away from their homes, they should go wherever it is most convenient to employ them. It must be remembered that these very people who often cry out about a distance test will not hesitate of their own accord to wander about the country at very long distances from their dwellings.

As to the distance test, I do not think supervision or inquiry into the condition of the people could enable us to dispense with this test. There were several people on the works who were not in extreme need—the fact of their being able to do work was not a proof of their being in absolute want. Many came by way of husbanding their resources, having nothing else to do at home. I should mention, however, that these people, who were not in extreme need, and who came on work by way of husbanding their resources, did so when the distance test became disorganized or relaxed. That test was sufficient to keep them away. At one time, about August 1877, I issued an order that every one was to be received on relief works wherever he applied, and the distance test applied to him afterwards by moving him with a gang; the result was that great numbers flocked on to the work—that being the time when it seemed that the monsoon had failed. The distance test was not applied in the spirit of my order directly these people came on, but afterwards; when it was enforced the rain had fallen, and though the people left the works, both causes acted in making them do so. There were a large number of people who would not have gone to any relief work unless it was at their doors, and, through refusing to submit to this, they grew weak and apathetic, and gradually fell into a famine condition. They did not realize that the refusal to go to work would cause death, and they lived in hope of something turning up. I think that artisans, as a class, would sooner submit to a degree of poverty dangerous to life than submit to the distance test. There are, on the other hand, many people, like Khatadars with cattle, &c., who, though not in absolute want, would come on to work close to their homes, but would not go far, and it would not be dangerous to keep them off. But it may be impolitic to keep even them off, because if a man is stripped to his skin before he comes on to work he can hardly get on afterwards.

Mr. Charles.—The distance test was applied, (1) by forcing all applicants for relief who were in a state to travel, to go from 10 to 20 miles from the point of application to a work; (2) by making occasional transfers of workmen from one work to another, so as to make sure of weeding out persons who had got on by giving false names and addresses. Except at the beginning of the famine, before the distance test was fully applied, no one was allowed work close to his own village, even though there was a work going on there.

People, for instance, applying for work at Hubli, were given passes to go on the Public Works Department work at Dastikop, 15 miles off, and I at Dastikop issued passes to applicants to go to the works near Sulkinkop, 20 miles off. No measures were taken to ensure that the persons given passes went, but as the passes did not entitle them to work anywhere else, it may be assumed that all who really required assistance, and were physically able to walk the distances, went where told.

Undoubtedly many people really in distress were deterred by this test, as the disinclination of some people to leave their homes and relatives is very strong, and indirectly deaths may have occurred from it, people delaying to accept the conditions of assistance till they were too far gone to recover when they did come. But I hardly see how this can be helped. No conditions could be devised sufficient to exclude fraud and pretence and yet mild enough to prevent suffering among the really deserving, and experience showed that very strict measures were needed, the applicants for relief having lost all sense of honour or self-respect, and looking upon every kind of stratagem as allowable to cheat the officials into taking them on works or into food kitchens on easy terms. The great difficulty in applying the test was the separation of families. If three or four or five persons of one family applied for work, it seldom happened that they were in a condition to go a long distance.

Mr. Moore.—I cannot give exact distances, but labourers during the late famine, to whom the distance test was applied, had to go from 10 to 50 or 60 miles. Ten miles is sufficient, as being far enough to test the applicant's real want of relief. In some cases and wherever possible the inhabitants of Z have been refused admittance at A, but in some cases at the height of the famine, when there were no large works, women, children, and old and feeble men were employed near their homes. The test has been effectual, and has kept away persons not in distress. I do not think it has been too severe.

Colonel Anderson.—One great difficulty in working the distance test occurred from the people mis-stating their villages. If large works are adopted few people would be within such a distance of their homes as would enable them to go to and fro daily. If possible people should not be employed within ten miles of their homes. It is not expedient to require people generally to go too great a distance from their homes, say 30 or 40 miles; they dislike it exceedingly, and will leave work and cause trouble in hunting them up when they have got into bad condition. This, of course, does not apply to selected gangs.

Mr. Robertson.—The distance test was laid down in Government Resolution No. $\frac{4\text{ C. W.}}{8}$ of 3rd January 1877, it being ordered that when a work under Public Works supervision is within 25 miles from a work under Civil supervision, the district officer should refuse to employ people on the latter work. Of course this did not refer to the aged and those unfit to work on a Public Works Department work.

Again, Government Resolution No. 83 P, of 18th June 1877, ruled that when a large public work is under execution within a distance of 20 miles from a work around any relief-house, all persons capable of travelling should be sent to such work.

I consider the distance test as one of the greatest importance; without it the Government would have to support crowds of people who are very well able to support themselves. When the district officers are careful to act up to the orders issued, no hardship can arise. Of course it was never intended that the test should be applied in a blind and unreasoning manner. Government Resolution No. $\frac{225\text{ E.}}{774}$ of 7th April 1877 is very explicit on this point. It was there observed—

"Although the distance test is a very valuable one, there undoubtedly may be numerous cases in which the strict (and possibly unreasoning) application of this test would inflict very great suffering, and the order which enjoins this arrangement provides for such a contingency by directing local officers to exercise discretion in applying the principle in practice."

"It is impossible to draft orders to meet every case, but Government have a right to expect—an expectation which is fully justified in the very great majority of cases—that officers will apply general principles, clearly enunciated for their guidance, in a reasonable and discriminating manner."

No, it was not enough that labourers should have to go some distance to and from the work. The distance was such as to make it next to impossible that a labourer could spend his night at home, be at muster in the morning, and work all the day through. The inhabitants of Z would have been refused admission tickets to the work at A, and would have been sent to the work at B or to one further off.

As a rule they would not be admitted on a work without a ticket. Still great care, and after-examination, by the district officer, of the people on a work, was necessary to prevent the wrong people getting on a work. The tickets were not individual tickets, but probably one mukadam would be sent with a number of people from Z to A. When near the work some of these would be induced by people at a village near to B to return to a district officer's camp for work, and then people from the village near to B would fill up their places in the gang going to B.

Still with due supervision by the district officer, by his continually visiting a work and mustering the people in rows, he was in most instances able, on making inquiries, to trace out such cases, and thus ensure the due enforcement of the distance test.

This distance test was found most difficult of enforcement in the Ahmednagar district along the line of railway; there the position of working parties was continually changing, and persons who had at first been working at a distance from their homes would find their work brought to the neighbourhood of their villages. If it was found that people who were working near their homes had originally entered the work at a distance, common fairness prevented their being discharged, because the work had progressed and approached their villages. In all such cases the muster rolls would prove whether a labourer had been on the work under the distance test.

The test has been effectual, and has kept away thousands who were not in such distress as to require State aid. If the test is not enforced, then every man in a village would turn out for employment, thinking he might as well live on State aid as spend his own funds. All such labourers were as a rule found to shirk their work, and many, on a fair task being enforced, would, even though the work was near home, leave rather than work.

I do not think the test has been too severe, or kept away people who were in distress. The Government Resolution No. $\frac{225\text{ E.}}{774}$ of 7th April 1877 gave the district officers full powers and left them a wise discretion, which, if properly used (as I invariably found it to be), prevented the rules acting with undue hardship.

I do not consider any modifications in the Distance Test Rules, as published by the Bombay Government, in any way called for.

When the distance test was not applied we had the works crowded by masses of people from neighbouring villages who were not in want; the application of the test at once reduced the numbers, and I never heard of any single bad result from it. The distance should be sufficient to make the people live away from their homes, and to show that they are sufficiently in want to submit to some inconvenience in order to get relief. I noticed this particularly on the railway, that when the work on the line came near villages, the villagers would try to come on; and then the civil officers would say that they must go to a more distant part of the work. It was, however, quite impossible to enforce a very long distance test. I was directed to try to get Sholapur people to the Nira canal—some 50 to 80 miles. I collected on two occasions two gangs of about 500 men, already on works, but only a few arrived, and these deserted shortly afterwards (see page 213). These were people in absolute and great distress; no one knows what became of them, but probably they came back to other relief-works. What they disliked was being away from their own country; a great many were cultivators or usually employed by cultivators, and they wished to be near enough to home to take advantage of any favourable change in the season.

Mr. Bosanquet.—So far as I was personally concerned, the distance test was not applied in this district till the famine became very far advanced. It was sometimes, however, necessary for persons requiring labour to be sent 30 or 40 miles for it on account of there being no large work under the Public Works Department in progress within that distance. The Public Works officers can explain the manner in which the arrangement of sending labourers "to the end of the line" on canal and road work was carried out. In the month of May it was found that, owing to a difficulty in providing sufficient supervision, the labourers on the line of road between Belgaum and Panchgaon, on the way to Kaladgi, shirked their tasks. It was found also that labourers appeared to prefer this work, on which, from the cause just stated, tasks could be shirked, to the work on the Gokak Canal, on which it was more difficult for this to be done. It was therefore decided by the Public Works officers of the two departments, after consultation, that it would be advisable to endeavour to draft a large number of men from the road to the canal, the distance between the two works being 30 or 40 miles. As it was not supposed that the labourers would go willingly from one work to the other, it was proposed that they should be given the option of going or of being dismissed altogether. In this way it was intended to transfer five or ten thousand labourers in gangs of 500 or so each. Unfortunately I was at a distance when this determination was resolved on, and on its being made known to me, the cause which led to it was not stated. As, therefore, the only object of moving the labourers appeared to be that, supposing some would prove contumacious and would refuse to go where ordered, their numbers would become reduced, I had no option but, pending further explanation, to deprecate the measure proposed. It is a matter of regret to me that, owing to press of work, I did not make a report on the subject to Government, who, I presume, on all particulars being stated in the report from the Public Works Department, ordered the arrangement proposed to be carried out immediately, and took me somewhat severely to task for not having acquiesced in it in the first instance. Whether they would have come to a similar decision had the cause which led to the recommendation been kept from them as it was from me I will not take upon myself to answer. On the

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occasion under notice, after a large number of those intended to be transferred had been dismissed for refusing to go where ordered, the project in regard to the remaining number was, I believe, abandoned.

In June or July, when rain had fallen, Government sent instructions that pressure should be put upon labourers to induce them to leave the works. Bearing in mind what had passed in May, as just explained, I determined to meet their wishes by endeavouring to concentrate the labourers on the canal work above alluded to. This work was favourably situated for the carrying out of such a measure, as the Gokak taluka adjoins all the talukas of the district except one, Bide, in which there was very little distress. The Commissioner, however, expressed an opinion that it would not be safe to carry out the measure in the most northern part of the district, and things there were therefore allowed to go on as they were. In some other places also labourers had to be engaged for roads which required repair. As the famine continued to press more severely in August and September, many people came into Belgaum in an emaciated condition, and the number of deaths at the relief-house at that place increased much. The experience of the famine has shown that persons who have long been in a starving condition are hopeless cases when attacked by diarrhœa or dysentery. I cannot state whether any cause of the mortality was owing to the application of the distance test in the manner explained; but had I the time over again I should, in the absence of distinct orders for enforcing it, prefer to avoid it.

Regarding the latter part of paragraph 5, I believe if it was found to interfere with discipline if the homes of the people were near enough the works to admit of their returning to them daily, the labourers should therefore be kept far enough away from them to prevent this, but on the other hand, if possible, they should not be kept too far away to be unable to visit them between Saturday night and Monday morning. The test when applied thus has probably not worked injuriously in keeping away persons who were really in distress.

Appajee Raojee.—I had as many as 12,000 or 13,000 people on the works in my taluka; there was no hutting on the Civil agency works; the distance test was enforced, and people were not allowed to come on within 10 or 12 miles of their homes. They often deceived us by saying that they came from a far village when they belonged to a near one; we required them to bring certificates from the Patels, and then those were forged. I disliked the distance test and wished to do without it. It would be possible without a distance test to select the labourers who are in real want; if they are in their own taluka they can easily be known.

The Rev. C. Harding.—I thought the distance test acted very unfavourably if the object is to save life. The people are loth to leave their homes, and it is very difficult to provide shelter for a large number of people, so that many suffered much from want of it. I refer especially to the Ashti tank and the civil relief works all over this district and in Kaladgi. Many had to live in the open, though much reduced, and deaths were very common. People who had experience of this kind of life were very averse to it, and when removed from one work to another they often went home and many died. One such work was on the Ekruk tank, near Sholapur. I visited the people; they lived about in the fields mostly; there were very few huts, if any. Their discomforts were very great. I often gave money to people who seemed in want of it. People were constantly dying, but I don't know if such deaths would appear in any return. In Kaladgi I saw many people who seemed to be starving and who would not go to works, though told they would get work 10 or 12 miles off. They were of all classes. Some gangs near Kaladgi were so weak that they could hardly walk. They had evidently been much reduced before they came to work, or else they would not have been received on Civil agency works. Public Works Department works were stopped at this time; rain was falling, and it was hoped they would go to their fields. I was told that by closing the works the numbers had been reduced from 118,000 to 16,000; grain was then (October 1877) 8 lbs. per rupee, and I knew there must be great suffering, so I went there to distribute charitable funds. I thought many of the people on the works ought to have been in hospital if there was to be any hope of saving their lives. There were hospitals and poor-houses, and most of the people who went there died. There was a famine camp formed here in September 1877, and all the very poorest were sent to it. I thought it was managed very well: the food was better and larger in quantity than they had been ever accustomed to get; the mortality was very great, especially in the rainy nights. In Sholapur about 70 or 80 dead bodies were picked up by the police every day in September before Sir R. Temple's visit.

Mr. Candy.—The distance test was useful, especially when worked generously and discreetly. It kept off those who had private means until those means were exhausted. It also prevented cheating: people would turn up at the muster morning and evening, spending the rest of the day in their villages. They could not do this if 10 miles from home and camped out. It told hardly on deserted children, deserted wives, and widows who were able-bodied, and therefore not recipients of village relief. Great pains were taken to supply people so sent on with means of subsistence by the road. It was very common for people to stray *en route* and take to wandering. This aimless wandering was the cause of mortality. I knew a case where Mr. Ozanne sent a gang of men, with great pains, to the railway at Dhond; they were put on to work on the Dhond side of the Bhima; they said no, they wanted to go to the other side, and after three days they all left and wandered back to their taluka, where he found them again. This was in March or April, and the Bhima was quite fordable.

Mr. Whiting.—I do not think the distance test really keeps away all people who are not necessitous, as I have known people go a long way with carts and bullocks to picnic on the works, bringing their household utensils and hutting materials with them; it thus tells harder on the poor than on the rich. But it is useful to have the power of removing people from one place to another.

Mr. Wingate.—I would not have a strict rule, but I think every officer should have the power of putting the test in force, and no officer who has the welfare of the people at heart would abuse it. Large works are self-acting tests in this respect, and, in dealing with large crowds of applicants either at works or headquarter stations, or in their villages, it is absolutely necessary to have the power of saying "If you wish relief, you must go to such and such a place." I have seen large crowds, say from one-fourth to half the population perhaps of a village, working the ordinary task on civil works and being paid less wages for more work than they could have got by going to a Department of Public Works work a few miles distant. These people included the well-to-do, the strong, and the non-necessitous. Outside these works were a smaller or larger crowd of piteous objects. The orders were to get a certain return in work, and the native officials said they could not admit the weakly and secure that return. All admitted that the workers could get along without the work,—in fact, all other villages had to get along with no such help. But being there, the people said they were glad to earn the Civil agency wage. I am convinced that a wage even below minimum subsistence, with a task enforced, will not in severe

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distress keep off the non-necessitous if the work is close to the village. I am equally convinced that if works are started early and not delayed too long, and if in charge of humane officers with a system that admits the weakest to earn a daily wage sufficient to support life, a distance test that necessitates living on the works will not to any serious extent keep off those in want. Of course, the very fact that economy as well as efficiency of relief is aimed at, tends to exclude, and among those excluded will be some necessitous; to correct this, the people in their villages must be closely watched.

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Mr. Price.—I have seen the distance test applied in moving from one part of a taluk to another, and one district to another. I drafted, under the orders of Government, a large number of coolies from the Cuddapah to the Nellore District for the Buckingham Canal, and I also passed on those who came from Bellary. I do not consider that it is advisable, except as a last resource, *i.e.*, when work cannot be found within the district, stocks are known to be almost exhausted, and supplies from without and carriage fail, to move people so far from their homes—first, because they go with the greatest reluctance, and desertion constantly occurs on the route and fills the country in the line of march with wanderers; second, because when rain falls a large number of laborers, who ought at once to become available in their own district for the commencement of agricultural operations, are not; third, that natives, especially in the interior, are so afraid of going to a country which they do not know that they will rather bring themselves to the verge of death by starvation than move; fourth, that it is a very expensive measure. I have found the distance test very efficacious in the taluks, as the immediate effect has been to clear off most, if not all, of those persons who did not require work; but I think that, at the same time, it occasionally caused the secession of people who required aid in the shape of work but who, being inhabitants of towns, would not go far from their homes. Ten miles was the minimum distance which we, in Cuddapah, took as sufficient for the test. During the famine people often wore themselves out by walking some seven or eight miles a day to work and back again in the evening, and this in the middle of the hot weather. It was right, if there was to be a distance test at all, that the distance assigned should be such as to put the walking backwards and forwards out of the question, and so make the people camp out near the work. A very common practice after the coolies became accustomed to the test was that they walked home to their villages, often as much as twenty miles away, on the Saturday evening and came back on the Monday morning. Some, however, never moved, preferring to remain where they were. There was no insisting upon the people living away from their homes. The system was "no work for any one within ten miles from his permanent residence." The rule in the case cited was that the people of Z were refused admission to A and directed to go to B. They were, if they refused, left to shift for themselves. If they consented to go to B, they were sent there, with nominal rolls, in charge of a head cooly. I never enforced the distance test, *as a rule*, until the Order of September 1877 came out; until then there was an option in the matter, and when I found the coolies loitering, coming from adjacent localities only, and that they comprised a number in good condition, I moved the whole party ten miles. I have even done it only five, with the immediate result of a falling off in numbers. To the best of my recollection the test was, after October 1877, relaxed but twice in the Cuddapah District: once in the case of the people of a portion of the Badvel Taluk, which had suffered very severely, and for whom employment had to be found whilst their crops were growing; they were allowed to come to works not less than five miles distant from their homes; and once in the case of some distressed people in the Kadiri Taluk, who, in consequence of the difficulty in just then getting any suitable work for them fulfilling the requirements of the test, were allowed to come to employment within the ten miles. I consider that the test was to a great degree effectual. It certainly cleared off many of those who did not really want help. The good which it produced far exceeded the harm caused, which was, in my opinion, limited. It would not, however, have been had it been worked all through the famine. Fortunately the worst was over before it was introduced by Government as a recognised rule.

Of the principle of a distance test I approve.

I would rigorously enforce it at the beginning and the end of a famine, but I would in no case, excepting that of the dire necessity occasioned by a breakdown in everything, move the people more than from one part of a taluk to another, and I would never move the people over twenty miles from their homes. This distance is quite sufficient to weed out all those who ought not to receive relief. I would relax matters as soon as it became apparent that distress was really severe, and continue the relaxation so long as this state of things existed. My reason for this view is that at this stage a large number of persons who are not, and never have been, accustomed to heavy manual labor, who are not inured to walking about, camping out, and so on, are driven to seek relief, and that, when they do so, their physical powers are considerably less than they would be in ordinary times. I would continue with the Pariah, Woddah, and laboring classes properly so called to insist upon their going to works 10 miles or more away; but as regards other classes I would give them work nearer home. There need never be much difficulty in drawing the line between laboring classes as a body and others, but to these others I would show indulgence only at the severe epoch of the famine.

Mr. A. McC. Webster.—When I joined the district the distress was on the decline, a crop having been obtained, but it was soon exhausted, and distress again increased though not to the extent of the previous year. At the time of my joining the district the distance test was not invariably enforced *as a test*. Coolies were employed on the works in progress, and it was only when more coolies were required on any particular work that people on one work were drafted to another. I cannot say, therefore, that the distance test was as a rule strictly enforced so as to require people to live away from their villages. In most cases the laborers had to go some way from their villages, sometimes as much as eight miles, but they generally returned to their homes to sleep. It was not insisted that they should live away from their homes. It was considered that the labor and wage tests were sufficient to ensure that no non-necessitous persons came to the works. Latterly the distance test has been more strictly enforced, the people in some instances being required to work thirty miles from their homes. Had the season continued bad, this test would have been too severe and would have led to a serious relapse of distress, and I should have felt it my duty to point out the hardship and recommend a relaxation in its severity; but before the test was strictly enforced there had been very favorable showers, cultivation commenced in the villages, and there was a demand for labor, and all who could do so left the works.

Now, if relief-works are not popular, the question is —Is a "distance" test necessary? There are the two other tests—the "wage" and the "labor" tests—both excellent in their way. Is a "distance" test required as well? My opinion is that a distance test without hustling the people will not add to the security against non-necessitous persons coming on the works, and, if the people are hustled, the remedy is worse than the disease. I consider the two other tests properly enforced to be amply sufficient to secure the object aimed at.

Even supposing that the "wage" and "labor" tests were not sufficient, I would still deprecate the institution of the distance test, for it is in my opinion a hard and unnatural test—if it can be called a test at all—and one that would, if strictly enforced, result in a great increase of destitution and in a large measure defeat the admitted object of Government to save life in a time of famine.

The general body of the people will not leave their homes except under the direst necessity, and even then many of them will rather die than do so.

There is a very large class of persons who in a year of distress would require relief. I mean the smaller ryot class. That this is a large class is shown from the rent-roll of the district. Out of a total of 216,208 puttahs held either singly or in part by 452,494 individuals, 151,563 puttahs are for lands paying less than 10 rupees. The total assessment of such puttahs is Rupees 6,99,740, or an average of about Rupees 4-8-0 per puttah. Of these puttahs 71,676 puttahs are subdivided among 207,679 individuals, who pay on an average Rupees 1-12-0 a-piece, so that the total number of petty landholders in this class only is 287,566, each paying on an average about Rupees 2½. This is exclusive of their families. But we must, I think, go to the next class. This class of puttah pays from 10 rupees to 30 rupees per annum, and contains 51,037 puttahs paying Rupees 7,89,458, or about 15 rupees per puttah. But of these puttahs 30,744 are "joint" puttahs held by 107,589 individuals paying 4,64,968 rupees, or about Rupees 4-8-0 a-piece, so that these also must be considered petty landholders, and the total of such persons will therefore be, exclusive of their families, 287,566 + 107,589 = 395,155, each paying about 3 rupees; as some of these men have more than one puttah, I will take the number at 300,000. Now these people in an ordinary season can just manage to scrape along and to support their families; but to do this they have occasionally to work as laborers in the fields of more wealthy ryots; they have no stores of grain; they pay the Government demand out of the produce of their lands, what little surplus they have going to supplement their wages; and in a season of distress they soon come on our hands. True, they may have surplus cattle, but these are soon sold, and, owing to pasture being scarce, realize next to nothing. Last year cattle were selling at Rupees 5 a-head, the usual price being Rupees 15 or 20. As these people live by agriculture, and it is to them that Government look for 50 per cent. of their land revenue, it is of great importance that they should be able to tide over an adverse season. I assume therefore that such people should be encouraged to retain their lands, a few ploughing-cattle, and seed-grain. If however these are sold off, the people are in the same position as the non-landholding class, and there is only the very general aversion to leave their homes to be considered. But, if they are trying to keep stock sufficient to take advantage of a favorable rain and cultivate, it is necessary that they should be near at hand, and should be in a position to look after their stock. When works are near their villages, some of the family can go to work; others can look after the house or stock. When rain falls the men will plough, the women will continue on the works. If they did not do so, they would not have any means of livelihood, for it is assumed that their stores of food-grain are exhausted, and the men who, where not absolutely required for cultivation, would also go to works; the wages earned would be shared among the whole family, and give each a certain, though not perhaps a sufficient, meal. These people have therefore a peculiar objection to go far from their villages, and a "distance" test would have the effect of keeping them away from work. Then their cattle and seed-grain would have to go, and after everything had gone, after their lands had been relinquished and their home broken up, would they perhaps go to the works, and even then their doing so until they were in a most emaciated condition would be doubtful. Many of these people, if they did not die, would find their way to the poor-houses, and would have to be kept on gratuitous relief without giving any return for their support. And after the famine they would be reduced to the position of agricultural laborers; labor would be a drug in the market, the land would be waste, and the Government revenue would suffer, and would not recover for a very long time. For all these considerations I am of opinion that the "distance" test should not be required, and that the people should, as far as possible, be employed within such a distance of their villages that they can return to their homes at night.

Mr. Grose.—I think the distance test should not be laid down at all. Each pauper should be allowed to get work wherever there is work.

Mr. Crole.—The distance test has, on the whole, been successful when properly worked, that is to say, when Nellore laborers, for instance, have been told off to works, like the Buckingham Canal, at a distance from their homes, but within the same district. It has failed in such cases as the examples cited in the question. No distance test is now exacted from professional agency coolies. This is a mistake.

Mr. Fawcett.—*The Distance Test.*—This test was applied within my experience—

(*a.*) In the case of coolies turned off the works in this division and told to go for work, if they wanted it, to the Buckingham Canal in Nellore. This was done for some time in the middle of the famine.

(*b.*) In the height and decline of the famine, by sending coolies distances of from ten to twenty miles for work at places in the same taluk.

(*c.*) In the beginning of the decline of the famine, that is in September last year, by stopping works in parts of the Cumbum Taluk and telling the coolies, if they wanted work, to go to Dorvala, in the north-west of the Markapur Taluk, from forty or fifty miles off.

Of the above, the first was not really done for the purpose of providing a distance test, though it acted as such. I shall refer to it further on in answering Question 35. In the very beginning of the famine no distance test was enforced. A little later on, and in the height of the famine, distances of from five to ten miles were enforced whenever possible, and afterwards coolies were made to go considerable distances, as in the case of the Cumbum Taluk coolies ordered to Dorvala mentioned already.

From what I have seen of the test I should say that it is a very good one, properly applied, but I would never enforce a distance of more than ten or twenty miles, or greater than would bring them into a country differing from their own in any material features. Coolies should always, where possible, be made to live away from their homes.

Mr. Jones.—As a rule I am opposed to the enforcement of the distance test. It seems to me a mistake to adopt any rule which would force on people in distress the necessity to travel a certain distance daily. The natural tendency of the people is to move about when in trouble, and this tendency becomes so depraved in course of time, and such a pregnant source of difficulty in combating and controlling the evils of famine to those engaged on the work, that I think any rule which fosters the tendency should be avoided.

Mr. Oldham.—*The Distance Test.*—With large relief-works in progress I have never seen the inhabitants of neighbouring small villages and hamlets successfully excluded from the works. But with regard to large villages and towns, the test was applied by removing the bulk of the laborers to a certain distance from them, employing on the intervening work a few permanent and identified gangs into which new applicants could not slip.

At present the test is applied by having one central work only in a taluk. This has undoubtedly kept away many persons who were in distress.

Except as a temporary expedient for dealing with masses of people who have rushed to the relief-works in numbers out of proportion to the available supervision, and as a measure directed against particular centres of population, I do not favor the test, which must be unequal and yet difficult to enforce against some of the persons for whom it is wanted. If it had to be applied systematically, I would do so by keeping all large relief-works at a certain distance from towns and large villages, five miles at least, by having huts provided for all the laborers, and by transferring them to other works (with hut accommodation) in their gangs as they stood, after they had been admitted and organised.

Lieut.-Col. Prendergast.—Works cannot be fixed on, at a particular distance from a village: works considered suitable were sanctioned; and the people who lived nearest came to them. People were not forced to live away from their homes when there was work near at hand. A being a work near Z village, the people of Z were not directed to go to B work, unless there were too many to keep at A. The clearance of the fort ditch at Vellore, and deepening the Suriagunta, gave employment to many people of the town of Vellore for several months. The works were instituted for the sake of the people of the town: the town people were not forced to go to works outside, nor were people from villages sent to the works at Vellore.

The distance test has been a good deal relaxed in this way: that people who were living in a cluster of villages, near a work, came to that work, and when there was distress all over the district, it seemed unnecessary, and cruel, to shift people about, when it was certain that they would be put on a work at one place, if not at another. There was a tendency among the civil officers too, from a feeling of compassion, to bring works near to the people, rather than to bring the people away to works. In the height of famine this system is, I think, quite admissible, but when times are not so bad, it is faulty. Villagers that were not in distress applied for work near their homes: they were told they could not be employed there, but that there were works further off for them: they altogether declined to go. Here the distance test acted as a check on the villagers. Having obtained nominal rolls from the Civil Department, they managed to represent themselves as in need of employment, but when subjected to the distance test, they no longer cared to ask for work. The test has been very effectual, and I am sure it has kept away people who were not in distress to a very considerable extent. I do not think it has been too severe at all; for if people were really unfit for work away from their homes, there was Civil Agency work or village relief to keep them from starvation. In general, I would say the distance test should be applied according to the local circumstances: when there is no doubt from the peoples' appearance that they must work, I would not care where they found the work; but when there is doubt, then I would transfer the people to a distance.

Lieut.-Col. Hasted.—The distance test I do not think answers. These people are hard to drive, and though many will go to a distance with their families for means of subsistence, they will not be driven to any particular work.

Mr. Rundall.—The Distance Test.—This is most important and should be rigidly enforced; it is a test for the enforcement of which the civil, not the professional department must be responsible, and moreover it is one which has been very much ignored during the recent famine.

From what I gather, the inhabitants of Bellary and other large towns were employed in the immediate vicinity, and as there was no tasking and scarcely any professional supervision, the actual outturn of useful work has been next to nothing. The distance test would have prevented the works becoming a lounge for all the hangers-on of a large military station. During the latter part of the famine, the inhabitants of Z have been sent to B and refused admission at A. I think 10 or 12 miles should be the minimum distance, and laborers should not go some distance to and from the work, but should be hutted at the work. The only relaxation of the distance test I would allow is the employment of the weaker people on well and tank clearing near the village *after* the bulk of those requiring relief have been sent to some work at a distance, and from these drafts of able-bodied people should be sent periodically to the large work.

Major Mead.—The distance test is most valuable and should not be less than 10 miles. In this district, South Arcot, there has been no great famine, but great distress. There were two famine relief works started as it was found that there were a large number of coolies on each work being near it, they were transferred to the work farthest from their homes; but few of them stood this test, they went away to their ordinary vocations.

The famine relief rates are very high, especially when the payment to the children is considered, and it is too attractive to coolies who live near the work. I would have no modification of this test for famine relief works proper.

Mr. Cotton.—On the work I have been in charge of the coolies have come from distances of 20, 25, and 30 miles and in a desperate condition, sometimes too weak to work at all for a day or two with hardly a rag, in some cases not even a rag, they have lost their all; their villages will go to rack and ruin, and they have been driven to the last extremity. I consider that, where it is advisable to start a large work, those coming from a distance should be relegated before they have come to this sad stage. The test is quite sufficient at a distance of three or four miles, not more, so that they can get back to their villages at night. On the work I am in charge of now I have found this the case, those who belonged to villages near by left as the work proceeded. In the Bengal famine in my experience, in the Sarun and Chuprah Districts, the embankments on the Gunduck and new and useful roads were quite sufficient to employ the people, and they were able to return to their homes at night. You saw no deserted villages and houses in ruins, and few homeless people. It appears to me that the test was sufficient if they went to and from their houses to their work.

Mr. Russell.—Ten miles from their homes has been taken to be the least distance at which work can be given, and it has been insisted on that coolies should live in the camps provided for them, as it was considered impossible that they could both walk to and fro for this distance, and at the same time do the daily amount of work required of them.

The inhabitants of Z have invariably been refused admittance on the work at A, near to their own village, and have in all cases been directed to go for work to B, ten miles off. In order to ensure that they do go to B, they are sent off under charge of a maistry, but there is of course nothing to prevent them wandering off anywhere they choose.

The test has only been relaxed in a case where the next work was situated at a distance of 25 miles or more and in the case of Civil Agency coolies. The test has been most effectual, and has, I believe, kept away all people who were not really in need of relief. I do not think the test has been too severe, but owing to the facts mentioned above, viz., that people come on to works under a false impression of the conditions under which they can obtain work, and are

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MADRAS.

disheartened when they learn them, I think that it has practically kept away some people who were in distress. I can propose no modification, except that, as mentioned above, viz., the conditions under which alone work can be given to them be clearly explained to all people when applying for relief to the civil officers.

Abdul Kareem Khan. — This test has in some cases been improperly applied and the laborers dragged to unnecessarily long distances. A distance of fifteen miles seems to be quite enough for all purposes. During the height of famine it was enough that the laborers had to go some distance to and from the work, but at its beginning it is to be insisted that they should live away from their homes. The penury that was indicated from their appearance and clothing and a regard to the sanitary measures necessitated the relaxation of the test, and hence the villagers being close to a work had also been employed on that work. The test on the whole has been to a great extent effectual, but at the same time it has been too severe when misapplied; it would therefore be advisable if a maximum distance of fifteen miles is fixed for this test, and that its enforcement be restricted at the beginning and in the decline of famine, and its relaxation authorised when the appearance of an applicant indicates extreme poverty and weakness.

Lieut. Henderson.—The distance test often fails, because, with a limited staff, it is impossible to trace or identify individual applicants for relief. All who come to large useful works should be taken on irrespective of the distances they may come.

Mr. Hayes.—The distance test (10 miles from their homes, if I remember rightly,) was attempted to be employed on my work, but the special Civil officer in charge of famine relief operations finding it practically unworkable dispensed with it when sending on coolies for employment. As a matter of fact three-fourths of the coolies on the relief work came from the surrounding villages, perhaps within a radius of six miles, and most of them returned to their homes at nightfall. They all had first gone to the tehsildars for enrolment in the lists sent me. I relaxed this rule in the case of wanderers, who were palpably in great distress, and sent them direct to the gangs, as any further delay in relieving them might have been attended with fatal consequences.

MYSORE.

MYSORE.

Major Moncrieff.—From my experience of famine the distance test is generally a failure. I grant it so far that if a work were in progress through the heart of a village I would make the stronger of the villagers go out 2 or 3 miles to it, and not allow them to work close to their own doors. But I strongly protest against the mistake (or it may be the cruelty) of forcing people 20 or 30 miles from their homes while there is a work within 2 or 3 miles. The result will be that many will not go, and will ultimately either die or require to be relieved gratuitously. It has been proved in Mysore a fallacy to suppose a native cannot be in want who will not go 10 miles to work. What I have said is not at variance with my opinion that 100,000 people must supported on a few large works will not only yield a better return to the State than the same number employed on 500 little works, but that they will also be better relieved. District officers should use every effort short of compulsion to induce paupers to go to these large works, especially such paupers as have children. Very many of these latter must have perishes lately solely because their parents would not go to large works at a distance from their village. The distance test may be judiciously applied however at the end of a famine, when there is no reason to fear that those who refuse it will perish from want, and when the cooly has got so used to Government works that he may be trusted to accept it, if he requires relief.

Mr. Ricketts.—The railway works have in some respects proved a distance test and a fair one to a certain degree. If, in the interests of Government, it is found necessary to concentrate work and supervision on a large and important undertaking, then it is nothing but right to require applicants to go to that work irrespective of the distance; but to insist upon applicants for relief living away from their homes, or in the case put in this paragraph, making them go to a distant work, whilst another work in progress was nearer to their homes, seems to me to savour of hardship and disregard of all those domestic and other ties which make life worth having.

As stated before, if distance is an absolute or even reasonable necessity to the existence of work at all, then the case is different, and the famine-stricken must adapt themselves to what in reality are the exigencies of the case; but I would not create what in fact may be termed an artificial distance, and which instead of limiting the calamity of famine will assuredly involve much additional destruction of life. Besides, when charity is given it is not meet to give it in the most trying and distasteful form, to say nothing of the proved fact that rather than take it in such manner, many elect to forego the charity altogether and perish in consequence. An applicant for relief who can work and won't work, is no object of sympathy; but the case is different with one who is willing to work, but who revolts from the distance test either from pure physical incapacity or from natural reluctance to break up, and perhaps for ever, all home ties, in favour of what to his ignorant mind must appear a most uncertain and hopeless future.

H. III. Qn. 6.

QUESTION 6.—THE WAGE TEST.

The Wage Test.—Where relief is given in the form of money wages, the wage will be chiefly based on the quantity, kind, and price of food required to support life, with a margin for condiments and contingencies. What are the assumptions as to the quantities of food to be given to labourers of different ages, sexes, and capacities for labour, and the extra allowance for condiments, &c? Have you any data by which to test the accuracy or error of the assumption made as to the quantity of food required? State your experience as to the physical condition of labourers who have for some time subsisted on any given relief wage, giving the amount of that wage, and the quantity of food it supplies? What have you ascertained as to the actual kind and quantity of food purchased by labourers with their wage? How is the price ascertained of the standard kind of food on which the wage is based? How would you, with your present experience, formulate the conditions of the wage test.

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Punjab.—Wages are stated at 12 chittachs of grain with dal, and in money $1\frac{1}{2}$ to 2 annas for men.

North-Western Provinces.—The allowance concurred in as sufficient for men is 10 chittachs of wheat flour, 2 of dal, and condiments. The money value of this should be the wage. It is said that savings were made from this wage.

Bengal.—Various rates of wage are mentioned, $2\frac{1}{2}$, 2, and $1\frac{1}{2}$, annas per man; also "piece-work at liberal rates," 4 annas per 100 cubic feet, Government grain being sold at 10 seers per rupee and afterwards lower.

Bombay.—14 answers. The general opinion is that the Bombay wage was sufficient, but with no margin for fines, mistakes, and cheating. It was sufficient, provided that special treatment was added for the sick, and with the allowance for young children. It would, however, be well to add the Sunday wage. One officer is entirely opposed to the sufficiency of the wage; but his personal experience and observation were small.

Madras.—Thirty-three European and 4 Native gentlemen have replied.

Opinions are diverse. The controversy is between the Bombay wage, tried in Madras from January to May 1877, and the higher Madras rate adopted in September. The former being paid for seven days and the latter for six, the increase given by the latter when 1 lb. of grain = 1 anna was for men on Public Works Department works $1\frac{5}{7}$ pies per day, and on civil agency works $2\frac{4}{7}$ pies per day. Some officers hold that the Bombay scale was insufficient, and that the effect of the Bombay civil agency rate was bad; one officer says "disastrous." Other officers think that the Bombay civil agency rate (1 lb. + $\frac{1}{2}$ anna) is enough on light work, or enough if the people get it in full. The Madras wage (1 lb. + $1\frac{1}{2}$ annas for six days) is called by various officers fair, ample, liberal. It is stated that the labourers improved, gained flesh on it, saved something. Some officers think the rate for women (1 lb. + 1 anna) too high. A surgeon considers the Bombay civil agency wage quite sufficient for those who do hardly any work, but that men should have 20 oz. and women 16, + $\frac{1}{2}$ anna if employed in digging earth. Another opinion is that $1\frac{1}{2}$ lb. + 6 pies is the lowest safe rate for men. It is recommended that the grain basis of wage should be 20 to 30 oz., according to the task, with a smaller sum (8 pies) for condiments.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—From last year's experience I am of opinion that for a grown-up man 12 chittaks of grain is sufficient to support life, and for a grown-up woman 8 chittaks, while for children from 6 to 10 years of age 6 chittaks. In cases where relief was given in the form of money wages, 2 annas for a grown-up man, $1\frac{1}{2}$ anna for a woman, and 1 anna for children fit to work were allowed. This rate of money wages was sufficient with reference to the selling price of food grain which prevailed at the time of the distress, including cost of condiments. Little children were allowed from 6 to 9 pies a day. The scale of food mentioned above was for weak and infirm persons, who were unfit for work, and received gratuitous relief. The rate of money wages allowed to persons employed on relief works was barely sufficient for their support, and they could not save anything out of it. The selling price of food grains in last year, when distress prevailed in this district, was from 13 to 15 seers per rupee, viz., wheat 13 seers, gram 15 seers, barley and wheat mixed 14 seers. The wages were fixed with reference to the selling price of food grains.

Colonel Parsons.—(*a.*) For labourers the following are assumed to be sufficient quantities of food to be provided:—

For men - -	$\frac{3}{4}$ to 1 seer of flour.	exclusive of condiments.
„ women -	$\frac{1}{2}$ to $\frac{3}{4}$ „	
„ children -	$\frac{1}{4}$ to $\frac{1}{2}$ „	

(*b.*) The data in support of the above are, that wages have been paid at rates (having regard to the price of food) such as to enable the labourers thus to provide for themselves. (*c.*) Labourers have much improved in physical condition under above circumstances. (*d.*) Labourers have purchased gram, wheat flour, and mixed wheat and barley flour according to state of the markets; the quantity purchased is much as above, sometimes a little more or a little less. (*e.*) The price is ascertained by local inquiry, or by estimating same in villages as slightly cheaper than the well-known tahsíl rates. (*f.*) Wages to provide food as above appear expedient.

Mr. Nicholl.—*The Wages Test.*—The quantities of food to be given to labourers of different sexes are, in my opinion—

Men - 12 chittaks of the flour of wheat, barley, or Indian corn.
$1\frac{1}{2}$ chittak of dál.
$\frac{1}{4}$ ounce of salt.
Women - 8 chittaks of flour.
1 chittak of dál.
$\frac{1}{4}$ ounce of salt.

On this dietary able-bodied men and women can subsist for any length of time, and give a fair day's work. For labourers employed on light labour less would suffice, and for children half the scale for a *woman* is sufficient.

On the works on which I have been engaged the rates of wages were:—

Able-bodied men, $1\frac{1}{2}$ annas per day.
„ women, 1 anna „
Children, from 6 to 9 pies „

On these wages the physical condition of the people remained unimpaired, and they were able to give a fair day's work. The quantity of food which these wages provided was that given above, but then a scarcity only prevailed. and food was not at famine prices.

Labourers purchase the cheapest food procurable, regardless of its quality.

The price of food on which the wage is based is regulated according to the prices current in the bazaar; these are fixed from time to time by the Chaudris according to the laws of supply and demand, as understood by them.

The wage should be the same required to purchase a certain quantity of food, sufficient for the support of labourers of all ages and sexes.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Colvin.—We have no wage test as apart from a labour test. Government has prescribed the answer to the first question. Our labourers did well and throve on their wage. The cheapest grain was usually purchased,—barley in this instance; but cooked food was not always eaten, *chabena* and other parched grain being used, and the money wage saved for a future day or for the wife at home.

The price ascertained is that of the cheapest available food grain. I would give no man one pice more than he earned, at a rate so fixed as to give him the Government average, if he did the amount of work on which it was calculated. This would be regulated by his assumed capabilities; and all men would be grouped for capability purposes. I would have no so-called minimum wage, which is a *reductio ad absurdum* of the relief wage. I never allowed it here, and our works were crowded and most successful.

Mr. Sandys.—The relief wage given during the past two months has been as follows:—

Men	- - -	1 anna to 1½ annas.
Women	- - -	1 anna to 1¼ do.
Children	- - -	½ anna to ¾ do.

The physical condition of the labourers, and specially of those who are weakly, rapidly improved.

The quantity of food that it supplied at the average prevailing prices of food ordinarily purchased on the works is for—

Men.—Wheat or barley flour, 10 chittacks + from 3 to 9 pies for condiments.

Women.—Wheat or barley flour, 8 chittacks + from 3 to 6 pies for condiments.

Children.—Wheat or barley flour, 4 chittacks + from 1 to 3 pies for condiments.

The actual kind and quantity of food ordinarily purchased by the labourers on the works is for—

Men.—Barley or mixed barley and gram flour from 10 to 12 chittacks, dál and salt, sometimes chillies, 3 pies.

Women.—Barley or mixed barley and gram flour about 8 chittacks, dál and salt, sometimes chillies, 3 pies.

Children.—Ditto about 4 chittacks, dál and salt ½ to ¾ of a pice.

Dealers have been allowed to bring their shops on to the works, and the selling price is regulated by the prices prevailing in the nearest tahsíl, with a fair allowance for carriage.

Mr. Tracy.—It is assumed that the following quantities of food are sufficient for the bare subsistence of relief labourers.

Man, 10 chittacks flour, 2 chittacks dál, ¼ chittack salt.

Woman, 8 chittacks flour, 1½ chittacks dál.

Children under 10 years, 4 chittacks flour, 1 chittack dál.

Children in arms, 2 chittacks flour, 1 chittack dál.

Eight chittacks atta and two chittacks dál per day is enough for an adult, and half of it for a child under 10 years of age. The weight is Government weight, 80 tolas to a seer. For dál, vegetables should be substituted two or three times a week. A doctor is the best judge of diet in special cases of innutrition; as a rule, rice and milk should be given. One pound of atta with condiments is found sufficient in jails and poorhouse. In jails prisoners almost invariably increase in weight, and in the two poorhouses in this district, last cold weather, this diet was found ample. The requisite condiments are 100 grains of salt and two chillies. A man in work with this diet, will, as a rule, increase in weight. The jail books of this district prove this even when the work is not light. From 1st November to 30th June last, out of 1,326 men, 665, or rather more than half, gained weight on this diet, and that too on hard work.

The price of the food on which the wage is based is ascertained from the reports of the market rates submitted from time to time to the Collector.

I can suggest no improvement to the provisions of section 7 of the North-Western Provinces' Famine Circular No. 51A of 1878. I consider, however, that the larger allowance granted to special gangs of people in a reduced condition is decidedly objectionable. In the first place it is unnecessary, as the allowance of food which will maintain ordinary labourers in health and strength is more than the weakly and debilitated can consume or digest. In the second place it tends to demoralize the people. Numbers are attracted to the works by the hope of being enrolled in an inefficient gang, and thereby getting high pay and light work. The ordinary labourers are discontented, and abandon their proper work in the hope of being taken into the inefficient gang.

(The remainder of the reply to Question 6 has been furnished by Dr. Sanders, Civil Surgeon.)

"8 chittacks of atta, Government weight, is sufficient to support an able-bodied man. Prisoners in jail almost always invariably increase in weight on it; 2 chittacks of dál, and in place of it vegetables, two or three times a week should be added, also 100 grains of salt and 2 chillies. The jail return here for the last six months shows the truth of this. In the Hassanpur poor-house, open for more than four months, last cold weather, the above diet was found sufficient; the paupers improved on it, both as regards health and condition. Labourers receiving money wages will, as a rule, in time of scarcity buy the cheapest food going. The price of the standard kind of food can be ascertained by bazaar reports furnished by the tahsíldar."

Mr. Leeds.—The wage paid on relief works should, in my opinion, be strictly a subsistence one, and at the utmost, for an adult male, should never exceed the money equivalent of ten chittacks of coarse flour, plus three pies for condiments, &c. With bejar at 16 seers this would give one anna per diem as the rate of wage for an adult male, nine pies for a female, and six pies for a child.

At the rates recently prescribed by the Government of India, and laid down in revised Circular No. 51A of 1878, a chamár family, consisting of a man, his wife, one big child, one small child, and a baby in arms, could positively earn more—in grain, be it remembered, and not merely in money—than they were in the habit of earning in ordinary times.

I have never seen the earning of an agricultural chamár family set down as higher than three rupees a month all the year round, for it is only exceptionally that the wife and children can obtain employment in the fields and elsewhere, and this being so, the calculation is as follows:—

A.—Earnings in an ordinary season of an agricultural chamár family constituted as above:—

		Rs.
In money per mensem	- -	3
Equivalent in grain at 35 seers of bejar flour to the rupee	-	105 seers.

B.—Earnings of the same family employed on a relief work:—

		a.	p.	
Husband	-	1	6	per diem.
Wife -	-	1	0	„
Big child	-	1	0	„
Small do.	-	0	6	„
Baby -	-	0	3	„

			Rs.	a.	p.
	4	3 or per month of 30 days	7	15	6

Equivalent in grain at 16 seers of bejar flour to the rupee - 127½ seers.

The above statement speaks for itself, and if it be further borne in mind that the work is much lighter than field labour, that it is paid for daily in cash, and that there is no separation of the members of a family, the popularity of relief works can easily be understood.

As a practical illustration I may add that very shortly after the promulgation of the new rates, *i.e.*, early in August, a relief work was opened in a part of the Muttra district, not by any means exceptionally distressed, and that within the first fortnight the number of labourers had risen to 20,000.

Dr. Hilson.—The quantity of food necessary for a labouring man is 10 chittacks of wheat flour and two chittacks of dál, with condiments, per diem.

This diet, however, is only suitable for those doing light work, such as weaving, spinning, weeding, &c., and it was found that the paupers in the Agra poorhouse have thrived upon it. But if the work be of a laborious nature, from two to four additional chittacks of wheat flour or ground grain should be given, and care should always be taken to substitute vegetables and oil for the dál three times a week, because dál is too heating and nitrogenous an article of diet to be taken every day.

The vegetables and oil not only prevent scurvy, but impart an agreeable variety to the diet, while the increased quantity of oleaginous elements contained in the food tends to preserve the general health. From 150 to 200 grains of salt should be given to each adult; and when the diet consists principally of rice, this quantity should be increased by about one-third, owing to the deficiency of salts contained in the rice itself.

A boy above 10 years of age should get not less than 8 chittacks of atta with two chittacks of dál when doing light work, and two additional chittacks of atta should be given if the work exacted be at all severe; 150 grains of salt will be sufficient.

Women may be classed with boys over ten years of age.

A boy between 3 and 10 years should have from 4 to 6 chittacks of atta, according to age, with one chittack of dál and 120 grains of salt. Two chittacks of milk with one of dallia should also be given. Vegetables and oil should take the place of the dál two or three times a week.

Dr. Jackson.—The only statistics I know of which bear on this point are those of the jail. Prisoners of three months and under are placed on a reduced scale—eight chittacks atta with two chittacks dál or four of vegetables. These are labouring prisoners, and the nature of the labour is very different from that of a poorhouse of destitutes. The last statistics of this jail show that, while 36 per cent., at their discharge, of these prisoners are of the same or increased weight, 64 per cent have lost weight.

Of prisoners over three months, whose scale of dietary consists of 10 chittacks atta, 2 chittacks dál, and 2 chittacks parched gram, the statistics show that while 58 per cent. are of the same or have gained weight, 42 per cent. have lost.

The statistics are confined to late observations in the Saháranpur jail, and I do not know how they agree with the results of other jails. But they are consistent with probability. They show that the lower scale, combined with the depressing effects of initial imprisonment, is not sufficient to maintain adults in robust health and flesh, and if continued for a long period of imprisonment might result in serious mischief. But the conditions of starving beings are not the same as those of convicted criminals, and it is quite compatible with reason to aver that a scale of dietary which may be permissible, and as an aid to deterrency from petty crimes is most effectual, in the case of very short-term prisoners, though strictly what may be called ***short commons***, and absolutely less than the body craves, may at the same time be found to be ample for the sustenance of the inmates of a temporary poorhouse. While the prisoners do as a rule lose flesh, most certainly the paupers put on flesh and gain strength under the regimen.

Dr. R. D. Logg.—Since the 1st November 1877, and up to the 31st October 1878, a trial has been made of giving a reduced diet of 1 lb. raw flour with the usual condiments, and a chittack of oil to all prisoners sentenced to one month's imprisonment and under in the Hardoi jail, and, I believe, the other jails of the North-Western Provinces and Oudh; in my own jail I am in a position to state with favourable results; the reduced scale of diet being found not only sufficient to support life, but, as a rule, proved also sufficient to keep up the condition of the body, and this, notwithstanding their being put to hard, light, and medium labour, a number of prisoners even gaining in weight during their stay in jail. Among the 426 prisoners treated as above, six were admitted into jail in bad health, of whom one died, two improved and were discharged in good health, three only being discharged in bad health, 37 of them gained in weight, 218 lost slightly in weight, and 171 neither lost nor gained.

Dr. T. M. Sullivan.—A male labourer cannot work on less than 10 chittacks of atta and 2 of dál or its equivalent in other grain.

A woman -	- 8 chs. atta and	2	chs. dál.
Children over 10	- 6	„	$1\frac{1}{2}$	„
Ditto under 10	- 5	„	1	„
Ditto do. 6	- 4	„	1	„

A working man on eight chittacks atta and two of dál in a jail with every sanitary condition favourable to health will lose weight, on an average about $1\frac{1}{2}$ oz. daily, for the first 36 days.

Of course there are some disturbing elements in a jail, such as mental suffering in consequence of the loss of liberty or separation from family, &c., but under any circumstances it would not be safe to keep a man on less than 12 chittacks for more than three months.

In jail 363 adults were admitted with an average weight of 43 seers $13\frac{113}{363}$ chittacks; they were kept on eight chittacks of wheat and two of dál. After an average of 36 days their average weight was 42 seers $1\frac{165}{363}$ chittacks, or nearly $1\frac{1}{2}$ oz. loss daily; this included women as well as men. A more detailed report might be got from each of the jails in the North-Western Provinces at the end of the present experiment.

Mr. Daniell.—Circumstances vary; there are conditions when a man may consume all his wages in food daily; but from the experience I have gathered from the relief works in Basti, I am certain that the majority save from any wage. This can be understood where the people had passed through one year of hard times and were at work on the relief work in the second year with the fear of failure of rain and of crop before their eyes. They had parted with all their available domestic stock of utensils, spare clothes, &c., and saved up for the day when they would return home.

Some saved to collect money to buy seed, others for clothes; very few I should think lived up to their wages. Under these circumstances able-bodied men could not improve in condition, while the thin and weak still remained thin and weak. An increase of wage would perhaps have induced some to eat a little more, but hardly perhaps equivalent to the increase in wage.

Mr. Stoker.—The following was the scale of food laid down for our instruction and guidance by Government in the Public Works Department:—

——	Adult.	Child above 10.	Child below 10.
	Oz.	Oz.	Oz.
Flour - - - - -	16	12	8
Vegetables - - - -	4	2	2

The wage was to be fixed at a rate sufficient, with regard to current prices, to procure this amount and no more. The rate first fixed in Gorakhpur pice—

Man.	Woman.	Child.	Infant.
6	4	3	2

This was subsequently reduced to—

5	4	3	2

and finally fixed at—

5	4	3	1

The assumed food scale was inapplicable to the part of the country where I was stationed, where the food of the people is rice and not flour. Rice with arhar

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dál was the food generally consumed, although barley and even wheat were procurable at lower prices than rice. The price of rice varied during the currency of the final scale of wages from 9 to 10 seers per rupee —that is, the wages of an adult man sufficed to purchase from 9 to 10 chittacks of rice and dál (for dál was selling at the same price as rice), of a woman from $7\frac{1}{5}$ to 8, of a child from $5\frac{2}{5}$ to 6 chittacks, and of an infant from $1\frac{4}{5}$ to 2 chittacks.

I should be slow to assert that such self-denial was generally practised, but several cases came under my notice in which the recipients of these wages had actually saved part of them. One woman, I remember, came to complain that a piece of cloth which she had purchased from a Juláha was smaller than he had stated it to be when he sold it. When I asked where she got the money to buy the cloth, she said she had saved it out of her wages on the works, putting aside nearly every day one pice out of the four she received. This was corroborated. She did not present a reduced or emaciated appearance.

One form of fraud among the workmen was to join a gang low down the work early, and having obtained a ticket step away on some pretence, taking a circle round the country, and coming on the works higher up obtain a second ticket. The operation was repeated in the evening and two sets of pice realized. To detect this I used constantly to search labourers: anyone who had two tickets on his person stood self-convicted. In these very numerous searches I constantly found one or more pice in the men's possession, the savings of the wages of previous days.

On one occasion I searched the poor-house people who were in receipt of eight chittacks raw food and some salt daily, and found more than one of them with savings of grain (amounting in one case to over two seers) in their possession. I am inclined to think, however, that they supplemented Government relief by mendicancy.

However, these facts will show that the amount requisite for bare subsistence is less than is commonly assumed. I think the rates for children were the most favourable. A man with his wife and three or four children, and perhaps an infant, were in a better position than a single man or woman alone. I made inquiries into several such cases on the works. I regret very much that I have lost my notes of them, but I remember distinctly that a united family was able to afford what it considered a full meal of necessaries, and regularly reserve a small margin for luxuries, such as tobacco or gúr.

Firewood was procurable for nothing roundabout, and the people lost no opportunity of collecting wild herbs and fruit, mangoes, mango-stones, mahua, &c. But it is of course impossible to form any estimate of the amount of these. It is not possible, I consider, that they appreciably affected the general diet scale.

It must not be forgotten that the works were only open and wages only paid six days out of the seven; the actual available diet is therefore only six-sevenths of the daily scale I have mentioned above.

Dr. Prentis.—Judging from many years' experience as a superintendent of a jail I should think the following scale of diet for people on relief works would be sufficient, viz.:—

For men, atta 10 chittacks, dál 2 chittacks, salt 150 grains, chillies one, oil 1 chittack for every 25 men, firewood 6 chittacks each. If procurable 4 chittacks of vegetables can be given three times a week in lieu of the dál. For women, atta 8 chittacks, dál 2 chittacks, with condiments, &c., the same as for men. For children above 10, adult female diet. For children below 10, 5 chittacks of atta, and 1 chittack of dál, with condiments in proportion.

Dr. Deane.—I have had no experience of the quantities of food to be given to different ages and sexes; my experience has been solely confined to adult men, in good condition, when employed on various works, and it is as follows. In the months of April, May, and June 1877 I employed 100 men daily in brick-making; five men were obliged to turn out 1,000 kucha bricks per diem. Their food consisted of daily—

12 chittacks wheaten flour.
2 „ dál.
100 grains salt.

Every second day they got in addition four chittacks of vegetable (ság) each, and four chittacks mustard oil; for every 100 men also a pod or head of red pepper.

After working for about a month, I found the whole gang looking haggard and worn, and scarcely a man had maintained his weight. I doubled the quantity of oil and gave vegetables every day instead of every second day, and then watched to see how they would get on. The change was most marked, the additional oil and vegetables being just about enough and keeping them in good condition. I give this as an example of what men require who are performing really hard labour, as I need hardly say the diet I gave was an exceedingly generous one. I am convinced, however, that had I kept them on less I could only have done so at the expense of the health of nearly every man in the gang, and that I would have had a heavy mortality in the autumn and winter. Against that, however, I will now give my experience of what men who are on comparatively speaking light labour require. I speak of the labour in the majority of our jails, as jail repairs, drawing water, digging in the garden, cleaning the jail, cooking, barbers, &c. For nearly a year I have been trying a diet for men of three months' sentence and under, consisting of 8 chittacks flour, 2 chittacks dál, and 100 grains of salt daily; four times a week they get 4 chittacks vegetables each, mixed with 4 chittacks of mustard oil to every 100 men, and a pod or head of red pepper. Since I have been able to procure it (about a month) I have given a diet as follows:—

Makka $7\frac{1}{2}$ chittacks - }
Wheat flour $\frac{1}{2}$ chittack } daily.
Salt 100 grains - }

Three times a week 2 chittacks dál and four times a week vegetables with oil and pepper as above.

The diet is given as follows:—

At 11 a.m. $3\frac{1}{2}$ chittacks makka and $\frac{1}{2}$ chittack wheat is given in chapattis with the dál or vegetables, as the case may be. At 5 p.m. 4 chittacks makka is given boiled in water. Since I commenced giving these reduced diets (now nearly a year ago) I have carefully recorded the results, the number of men given to, their weights coming into and going out of jail, and their work in it. Finally, my opinion as to the sufficiency or otherwise of the diet—538 men were so remarked upon, and in only three or four cases did I find the food insufficient. As a rule, they lost *slightly* in weight, but their health remained perfectly good. I am quite certain that the diet is ample for *moderate* work, but utterly insufficient for really hard labour. Talking of hard labour I may mention that I look on digging by task work, if the ordinary full amount is exacted, as *very* hard work and requiring a diet as generous as I gave my brick-makers.

Capt. Currie.—In February and March the rates of wages, based upon the cost of these rations at the then prevailing prices, were—to men $1\frac{1}{2}$ anna, women one anna, and children half anna. The apparent result was that people who came in lean and starved went away in good physical condition. Although the rates are fixed on the assumption that wheaten flour is used, the people seldom bought it, preferring flour made from coarse grains either from choice or on account of its cheapness. The price of food is ascertained from the bazaars directly or through the tahsildar.

Mr. Quinn.—I think it most important that labourers on relief works should not receive more (taking of course the price of grain into consideration) than they ordinarily earn, and that they should not

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be induced to prefer employment on relief works to their ordinary work. It must be borne in mind that in relief works a whole family are taken on and earn wages, a state of things which ordinarily happens rarely, except at harvest time. The wage too is regularly paid. The amount and quality of food a man requires depends much on what he has been used to. It is unfair to the country, which has to bear the cost of famine expenditure, to do more than keep those relieved in the degree of material prosperity which they enjoy in ordinary years. If a Government does this it does much.

The rates paid in this district were:—

Beldar	4 pice, afterwards raised to 6 pice.
Coolies	4 pice, afterwards raised to 5 pice.
Women and big children	3 pice.
Children	2 and 1 pice.

The cheapest flour in the months during which relief works were carried on was—

January	Bájra flour, 12 seers the rupee. = 12 chittacks an anna.
February	Barley flour, old, 10 seers the rupee. = 10 chittacks an anna.
March	Barley flour, new, 16 seers the rupee. = 16 chittacks an anna.

On this wage the labourers rapidly improved in condition, and no complaints of its insufficiency were made.

The ordinary wages paid by the District Engineer are—

Beldars	2 annas.
Coolies	6 pice.
Women	4 to 6 pice.
Children	3 to 5 pice.

Lieut.-Col. Chamier.—As to wages, these have differed under different circulars. Where the orders have sanctioned wages in excess of that sum which is sufficient to purchase the quantity of food considered necessary to sustain life in health, numbers of able-bodied men were attracted who had up to that time managed to live in fair condition. Ten chittacks of flour plus 9 pies were too liberal wages for the strong. On a lower wage the physical condition of the workmen was good. It has been recently reduced by three pies. The system that of all others has proved to be the most attractive, hurtful, and demoralizing is the granting of a minimum wage for doing nothing at all. Lazy coolies had often been seen before famine relief works were opened, but it was quite a novel spectacle to see coolies sitting down and absolutely doing nothing. They were content to take the minimum wage; it gave them five pice each. A man and his wife and their child could thus earn 11 pice a day for the trouble of asking for it. No wonder that the increased in labourers was both sudden and large. The food purchased at the works was flour, rather less than the amount allowed the labourers in their daily earnings.

Dr. Cameron.—The relief works in this district have been of a petty character, and as no regular relief camps have been opened, I have had no good opportunity of forming an opinion on the questions of wage and the quantity of food that ought to be given to labourers. From my experience in the management of the jail, however, I have formed the opinion that a labouring man's strength cannot be maintained for any length of time on a less allowance than 10 chittacks of wheat flour and 2 chittacks of dál, with a pice worth or so of salt and other condiments, and firewood, per diem. Short term prisoners on a daily allowance of 8 chittacks of flour and 2 of dál when on light labour, and of an additional 2 chittacks of flour when on hard labour, have either lost weight or hardly maintained it. For men on the hardest work, such as digging, the allowance of flour should be 12 chittacks. For women, I think 8 chittacks of wheat flour with the same quantity as above of dál and condiments sufficient to keep them in fair condition. I have formed this opinion from what I have observed of women who had been on relief works for some time, as well as from my knowledge of female prisoners. For a large child, 6 chittacks of flour and 1½ of dál would be sufficient, for small children 2 to 4 chittacks of wheat flour according to age, and 1 of dál with a small allowance of condiments, I consider a sufficient allowance. I think, however, that for children under two years of age a quarter of a seer of milk should, if possible, be substituted for the dál.

The price of the standard kind of food on which the money wage is based would naturally be that obtaining in the nearest bazaar plus sufficient to induce a baniya to bring supplies to the works, and the wage ought to be sufficient to purchase the quantities of wheat flour and dál above stated plus a pice for condiments and firewood.

Dr. Bonavia.—I have no experience of the wage test, but the following information may be of some service. There are two *non*-labouring male prisoners in the Fyzabad jail. Their allowance of food is as follows:—

8 chittacks atta daily
2 „ dál three times a week with ghi.
4 „ (raw) vegetable cooked with oil four times a week.
1 pod of chillies, 72 grains of salt } at the rate of per day.

Their weights on admission (3rd May 1878), and on date of re-weighing (30th July 1878), were as follows:—

	Mds.	s.	c.	
(1)—3rd May 1878	1	17	0	
30th July „	1	11	0	
	0	6	0	loss.
(1)—3rd May 1878	1	10	14	
30th July „	1	10	0	
	0	0	14	loss.

These two men are thin.

There are also four labouring male prisoners, who are *short* termed (under three months), and therefore they are on the same diet as the preceding. Their labour is light; they sit down all day and twist "múnj," string for matting. Their weights on admission and again on 30th July are as under—

	Mds.	s.	c.	
(1)—Admission 17th May	1	30	8	
30th July	1	14	8	
	0	16	0	loss.
(2)—Admission 17th May	1	17	0	
30th July	1	10	8	
	0	6	8	loss.
(1)—Admission 22nd May	1	16	12	
30th July	1	11	8	
	0	5	4	loss.
(1)—Admission 29th May	1	9	12	
30th July	1	8	0	
	0	0	12	loss.

These four men do not look so thin as the two preceding, although they do some light work.

All these six men have lost weight on that diet, although they are well clothed and well sheltered, and cared for in many ways.

Dr. Higginson.—In October 1877 the Inspector-General of Prisons, North-Western Provinces and Oudh, with the sanction of Government, directed the introduction for one year of a reduced diet scale applicable to prisoners of terms not exceeding three months and to all female prisoners sentenced to rigorous imprisonment.

The reduced diet scale is as follows :—

I.—To all prisoners sentenced to imprisonment for one month, whether simple or rigorous.	Atta, 8 chittacks. Dhall, 2 ditto. Ghi, 1 chittack to 25 men. Salt, 1 ditto to 9 men. Chilli, 1 ditto.

On alternate days four chittacks vegetables in place of dhall, and oil to an equivalent amount in place of ghi.

II.—To all prisoners sentenced to terms of three months, or less than three months, but more than one month.

(*a.*)—As long as they are kept on labour involving hard labour.	Atta, 10 chittacks.
(*b.*)—When placed on light labour.	Atta, 8 chittacks, with the same quantities of dhall, &c., and condiments, as in I.

III.—To all female prisoners, of whatever terms or kind of imprisonment, unless they have children at the breast, the same as in I.

This reduced diet scale was brought into force in the Gonda jail on the 1st November 1877. Of 119 prisoners of class I. admitted since then the average weight on admission was 50 seers 1 chittack ; the average weight on discharge, 48 seers 8 chittacks. Only three were not in good health on discharge. Of 95 prisoners of class II., the average weight on admission was 49 seers 6 chittacks, and on discharge 47 seers 2 chittacks. All but one were in good health on discharge. Of class I., 94 had decreased in weight on discharge ; of class II., 74. The task of work given employs the prisoner steadily for at least eight hours of the day.

It may be concluded from the above that men, though working, may be kept for, at all events, three months on short diet and still maintain a very fair bodily condition. The average weight on admission shows, however, that there could not have been any very great want before imprisonment.

Dr. Ellis.—The wage given to relief labourers on earthworks near Sitapur in January to March was—to men 1¾ anna, to women and boys 1½ anna, to children 1 anna. This was sufficient to purchase, at the rates then current in the Sitapur bazaar, the following daily :—

		Atta. Chittacks.	Dál. Chittacks.	
For	Men	12½	2	Salt, pepper, and firewood for this ration.
	women	10	2	

The physical condition of the labourers on the above ration improved very much : those who joined weak and emaciated gained flesh rapidly. The price of the standard kind of food was ascertained from the returns of the Sitapur market, the rate being published twice a week.

Conditions of Wage Test.—The wage should, in my opinion, be as much money as would purchase—

		Atta. Chittacks.	Dál. Chittacks.	
For	Men	10	2	Salt, pepper, and firewood to cook this ration.
	Women	8	2	

that is, presuming that the labourers worked in the way that labourers on earthworks generally do.

Dr. C. Planck.—This question forms a portion of a very comprehensive series upon the important point of the tests applicable, by way of proof that an applicant for employment on a relief work is really a distressed person who ought to be relieved by paid employment.

Thus, if a person will go far from home to seek relief, he will have fulfilled the *distance test.* If he will do a fair day's work for, I suppose, a fair day's pay, he has fulfilled the *labour test.* If he will accept a wage sufficient to provide only a little more than a bare subsistence in return, I suppose, for a little work, then he has fulfilled the *wages test.*

In regard to these tests, supposing the applicants for employment to be persons really suffering from insufficient nourishment, I do not think the *distance test* ought to have any existence at all, because its practical result is the loss of shelter to such persons and injury to family ties. In considering this question of famine relief it must never be lost sight of that women, girls, and old persons form a large proportion of the applicants for employment, and the possibility of retaining the shelter of the home at night-time to such persons is almost as important, as regards their welfare, as the receipt of a subsistence allowance of food.

I do not say that the *distance test* may not have to be fulfilled by many persons, because of the impossibility of providing relief works in many places. But I would on no account apply it as a test and refuse employment to the necessitous who may have their homes near to a work.

On the contrary I think the best results of a relief work would be achieved by the employment thereon of as many necessitous persons as possible of the immediate neighbourhood.

In regard to the *labour test,* I suppose that a fair day's labour for a wage which will provide food, clothing, and shelter, in the country concerned, is the proof of the necessity of the vast labouring population of the civilized world at all times. But such test can never be practically applied on a famine relief work, because many of the persons who ask for employment there are not used to regular labour at all; because with their varying strength a fair day's labour cannot be apportioned to each; and because of the impossibility of laying out or providing a fair task for each where so many are concerned, with sudden influx of necessitous applicants for employment, trying beyond endurance the energies of local officers solicitous about the fair day's work.

Doubtless in theory it is right to lay stress upon the labour test; but, if not fulfilled in practice, I do not think anything of blame should attach to the responsible officers, or anything of regret be entertained about it at all. Principally I think it should be stringently enforced when, after the pressure of high prices has abated, the relieved people show any tendency to remain on the works.

There remains the *wage test,* which I understand to be a willingness to work as directed for a wage sufficient to purchase a subsistence allowance of food.

I have seen several works conducted on this principle, and have formed the opinion that on such works, situated near to a town, or bazaar, or banias' shops, where the people can lay out the pice they receive to advantage, very good results, even to the saving of many lives, have been obtained; but that on works far in the lonely country results have not been favourable, or the appearance of the work-people conducive to the belief that they are improving in condition. And I think this unfavourable result has been due in greatest measure to the facts that the wage received will not provide a subsistence allowance of food on the works, that means for properly cooking the food are not available, that night shelter or night clothing are often non-existent, the day clothing often but a little old rag. Yet shelter and clothing are as necessary for healthful life as food. When food, shelter, and clothing are all deficient, excessive mortality will result, and the good results of a famine relief work can best be measured by a record of mortality on the work. No such records are available, but I have reason to believe, as the result of local inquiry, that many persons have died on such works during the past six months in this province.

I think all we know concerning the amount of food required to support healthful life in this province has been learnt from our experience of prison diet and its results. The smallest diet ever allowed to an adult prisoner, and that only in recent times, has been 16 oz. of flour and 4 oz. of dâl, all properly cooked and seasoned; and the prisoners (all short term) so dieted have been well clothed and sheltered. I have reason to believe that prisoners so dieted have, as a rule, lost weight during their time of imprisonment.

I do not think *that* diet would be sufficient for an adult man on a relief work, But I think the diet of 20 oz. of wheat flour and 4 oz. of dâl laid down in the addendum to Famine Circular No. 51A, dated 11th May, is a sufficient diet to sustain life in health; and that the wages for labourers on relief works contained in (*b*), the amended para. 7 of that circular, will suffice on all occasions of scarcity likely to arise, to provide not only the food necessary to sustain life in health for men, women, children, and infants on the works, but leave, by good management, a trifling daily margin of money, which, by accumulation, may permit of the purchase of some article of clothing or cloth, or other necessity of life, for the person concerned.

The diet scale alluded to is valuable, principally as ruling what an individual, of the different sexes or ages, ought to eat to maintain life in health. And for an adult male it provides 20 oz. of wheat flour, 4 oz. of pulse, ½ oz. of salt, and 3 lb. of firewood; costing in all, when wheat, flour, and pulse are at the famine rate of 10 seers per rupee, 1½ anna. For women and children a like diet in proper proportion is ruled, the equivalent in money to be given.

I repeat that these diet scales provide a sufficient supply of food, and if the labourers on the works would, or could, feed themselves in accordance with these scales, the results would be most satisfactory. But, so far as I know, they often cannot do it, and I think they would not, if they could. The important matter is that they should receive the money which will permit of their doing it if they please. On some works that I have seen the wage was not ruled by its power to purchase this diet scale of food, but apparently by facility of distribution of the necessary pice—a man receiving four pice, a woman three pice, a child two pice daily,

And in practice that is the only possible method of distributing the wage.

The wage above mentioned will suffice to purchase the diet scale previously quoted, when wheat flour is selling at 15 seers the rupee, but I have seen it in force when wheat flour on the works was purchaseable at 8 seers the rupee; and there the people were living principally on parched barley and peas mixed, which was also sold at 8 seers for the rupee. These people, a considerable multitude, were generally in bad condition.

Under the most recent orders on this subject, a man here should have received seven pice, a woman five pice, and a child three pice, at least, daily. And in apportioning the wage, the value of food on the works, and not its value at sudder station or market town, should rule its amount.

My experience in regard to the question of food provided on a relief work far from a market town leads me to believe that this important matter should not be left to manage itself by the law of supply and demand. I have seen barley selling at 15½ seers the rupee in the nearest market town, and the same article parched selling on the works in the interior of the district at the rate of 15 pice weight for one pice of money, equivalent to about 7 seers the rupee. Such unnecessarily high rate required the expenditure for food of absolutely every pice received, and yet the people were miserable in appearance, many children ravenous.

I think the grain merchant, if left to himself in this matter, will not risk his valuable stores of grain by carrying them to the works, unless he can see his way to making very large profits which may compensate him for possible loss—a loss very possible indeed from vicissitudes of weather, from theft, from sudden departure of many customers for whom provision has been made, and in other ways well known to the merchants.

The law of supply and demand supposes the possibility of competition, but I have never seen any such condition of things existent in the so-called bazaar (heaps of grain under a tree or under a thatch) of a relief work. The bania or banias there are present by permission or at the request of the authorities generally,—I think at the request of the tahsîldar; and without such permission or request no competing bania would be likely to put in appearance.

I believe great good would result to the necessitous people by the establishment of Government grain stores in connection with a famine relief work—not stores in which Government shall be the buyer and seller, but in which Government, having advanced the cost of the grain, shall be in a position to exact from the bania a fair rate of sale on the works. So much once fairly established, the rate of wage can be justly apportioned without difficulty. Government being interested, the bania will be protected, his stores well housed on the works, the shops well distributed on the line of works.

And now I should say that although the rate of wage is very properly calculated upon its power to purchase a certain amount of food, as described, it will not all be so expended by the majority of the recipients. Long before the works have been established, the people who come to them have, as a rule, lived after a fashion which unfits them to venture upon such extravagant living as the diet scale provides. They are emaciated; have become familiar with fasting; their clothes are in rags; their brass vessels and every saleable article they possessed have been parted with. They come often in families, husband, wife, children, all their property a basket containing two or three earthen pots or wooden dishes. To people so reduced the longing to save something out of the subsistence allowance granted is irresistible. These minute savings are principally hoarded, I think, with a view to their expenditure for such amount of cloth as will save them at least from absolute nakedness. And these savings are possible, because the people eat less than the scale, and certainly never purchase fuel, and seldom salt or pulse. They live principally on parched barley, parched peas, or parched gram, and comparatively little flour of any kind is consumed on the works. Bread is seldom made; it is too expensive; the means for its preparation and cooking are not easy of attainment; and I have not in connection with, or near, any relief work, seen any considerable number of *chulas*, which would be a prominent feature there if many people made bread. And even if the people wished to make bread, I do not think, speaking of works far from a market town, that they could buy the necessary flour. I think inquiry would show that the banias do not keep any large supply of flour on hand, but as an established practice grind daily so much corn as they require for sale as flour; the reason being, that whereas in this country grain is easily kept in good condition, flour quickly spoils; and I doubt the probability of flour of any kind being supplied in large quantities on a relief work.

Supposing by way of example that a relief work giving employment to 10,000 persons is opened in any portion of the interior of a district, and supposing that each person employed would like to purchase half a seer of flour daily, the daily requirement would be 5,000 seers of flour in addition to the ordinary requirements of the neighbourhood. The preparation of so much would require the constant working of at least 250 pairs of millstones, and I doubt if the banias of any district are prepared for such a sudden increase

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of demand for flour, or ready to make the necessary increase to their establishments for its preparation.

If the difficulty is great for 10,000 persons, what is it likely to be for 50,000? and the numbers on a relief work have reached that total.

I know that flour of different kinds is purchaseable on a relief work, and is purchased in small quantities by some of the work-people, principally for the consumption of their children, who gather straws, and twigs, and dried stalks of plants (thrown out or left on the land by the cultivators) in the day-time, and with the fuel thus provided, water is heated in the evening-time, the flour stirred into it, and the resulting stirabout given to the children. But fuel suitable for making bread on a large scale cannot be obtained in this way, most certainly not after the work has been open for a few days; and, so far as my experience goes, work-people will not buy fuel. At only one relief work that I have seen had a wood-seller opened a shop, and as he could sell no wood he soon returned to his home.

If wood is necessary for the preparation of bread, it is not less necessary for the preparation of dál; and although on relief works near to a town I have had reason to believe that bread was made in considerable quantity, I have not been able to find any collection of necessitous work-people who as a rule ate dál or salt with their bread.

The staff of life on relief works, so far as I know them, appears to be parched grain brought in large quantities ready parched from the nearest towns, and even parched on or near to the works, the fuel used being the dried leaves gathered from the groves of the neighbourhood, of which great quantities seem to be obtainable for the trouble of collection. To an uncertain quantity of this parched grain (usually barley, peas, or gram, alone or mixed) an addition is made of any eatable thing that can be got for nothing —weed-like *sags* (spinach) gathered from the fields, kernels of mango-stones, roots of lilies, and other things counted valueless, which people who know where to look for them can find in considerable quantities. And so life is kept going fairly well as regards the majority, and something of the wage is saved for other than food purposes.

I think the Government view of this matter is that the money given will all be expended in food, to the speedy recovery of health and strength.

But that is not the view of the work-people, nor of any people in the world, that all they get shall go in food. Practically the people know that food alone will not save them from disease. They have longings for better coverings, longings for tobacco, longings for something of luxury, sour or sweet, as dahi or gur, want a mat to lie on, want even to save a few annas to commence life with when they are able to get back to their homes.

So they economize to the utmost verge of possibility as regards food proper, often indeed to their own detriment.

I have on several occasions listened to the argument that a certain remarkably low wage as compared with the value of grain on the works must be sufficient, because pice have been found in the possession of some of the poor people, or tied in the rags of those who have died. Whereas I feel certain that, however low the wage may be, consonant with the power to attract labourers at all, something of it will be kept for other than food purposes. And it is this which makes it so essential that the power of reducing the wage in any serious degree below the amount known to be necessary to support life in health should be very sparingly exercised, if exercised at all.

Concerning the labour which should be exacted in return for the subsistence wage, my experience is that the people who come for relief are willing enough to work if they can be shown what they have to do, and are able to do it. The *multitude* are made up of a minority of strong persons and a majority of weak, and all the works I have seen were earthworks for the improvement or making of roadways or railways—work which every person can do without teaching. I have seen the people working in a confused crowd, so that it was hard to tell how much each person did; and I have seen them working in gangs with considerable amount of order and regularity.

The best managed work, in regard to this matter, I have seen was one in which the people were divided into gangs of 100 persons, every 100 consisting of about 20 strong persons (men) with spades, and 80 weak persons (women, old men, and children) with baskets. The daily task marked out for these 100 persons was the digging and carrying of 1,000 cubic feet of earth: the 20 men digging it, and the 80 weak persons carrying it, a lead of about 40 yards there and back. The digging of 50 cubic feet of earth is about half a day's work of a strong practised excavator working with a good spade. The men on this work had bad spades. If all the weak persons worked equally, they carried about 13 cubic feet each. Their baskets as a rule were small and broken, and perhaps to carry a cubic foot of earth they would have had to traverse the lead 10 times. (I find by experiment that a cubic foot of damp garden mould weighs about 70 lb., and I do not think the people carried more than 7 lb. at each trip.) If these data are correct, it follows that each of the weakly persons traversed 5,200 yards (about three miles) to perform their day's work—a light task, but yet I think a sufficient labour for persons in bad condition as they were. Not that they would not have done more if more had been asked of them, for I have seen a relief work in which the lead was 280 yards there and back, two cowries being paid for each trip as the basket was emptied.

In the town near that work 64 cowries at that time were equal in value to one pice. It follows that the people had to traverse 8,960 yards to earn a pice and about 20 miles to earn an anna. Yet they were working to the number of about 500 persons, many in fair condition, some in bad, very earnestly and at quick pace. The work had been commenced only the day previous to my inspection.

The severity of the labour being recognized, the rate was altered to three cowries a trip, thus reducing the traverse to about 13⅓ miles for an anna. In all 84 trips would have to be made at this rate to earn one anna; and on the assumption that 7 lb. of earth were carried on each trip, the cubic foot weighing 70 lb., it follows that about 8⅖ cubic-feet only would be carried by each person. Yet the labour here was infinitely greater than that of the 80 weakly persons who carried 13 cubic feet each.

When task-work is to be exacted, there is perhaps no better method of exacting it than by the use of this *cowrie trip* system (tin tokens, if necessary, being used as representatives of cowries), the wage being apportioned by the length of lead, say at the rate of 50 yards for one cowrie, which equals a traverse of 11 miles for six pice.

But, however the matter is managed, above all things earnest attention must be given to the lead, so that on no account may a distressed person who has really laboured well be subject to a deduction from the sanctioned full allowance by reason of the small results achieved.

Ideas of a day's earthwork labour for a strong excavator appear to differ. I have heard a chief engineer put it at 200 cubic feet dug by the man and carried by a woman and boy, a lead of 40 yards there and back. That is a gigantic task, as anyone may learn by making the necessary calculation. It is probable that if they carried 10 lb. at each trip, the woman and the boy would each walk about 16 miles. A subordinate engineer put it at from 100 to 120 cubic feet for the same three persons, which is more likely to be the correct average, I think. Some definite statement in regard to what constitutes a day's labour on a relief work is required, I think, seeing that the payment is only a subsistence allowance, that to dig 50 cubic feet of earth, and break it for the baskets if necessary, should be considered a full day's work for a man in fair or good condition, and that the 50 feet so excavated should be carried by four weakly persons if the lead is less than 50 yards, by six weakly persons if it is between 50 and 75 yards, by eight if it is from 75 to 100 yards, and so on, increasing the weakly persons by two for every 25 yards increase of lead.

When the 50 cubic feet have been carried, those engaged in the work should be considered to have earned their subsistence allowance in full, and I would formulate the conditions of the wage test accordingly. With a task so lightly apportioned and adjusted, I do not think any applicant for relief would refuse to perform it, excepting such as were physically unfit, proper inmates for the poor-house.

The distribution of the wage is a matter of great importance and considerable difficulty. In all the works that I have seen the wage was distributed daily, and on two occasions certainly I have heard the local officers complain that the distribution could not be completed until past midnight.

Now I do not think the business of distribution of pice can be effected with justness and regularity after the daylight has passed away. Though I have heard many and bitter complaints of the high price of grain on the works, I have never heard any person there complain of not having received the promised daily wage. I suppose such a thing may have happened, but it must be rare. It is more possible that some have received a double wage, especially when payment has been made in comparative darkness.

I have an idea that a principal reason why the distribution of the wage extends into the night-time is that the officers who superintend it are disinclined to commence the arduous work until the sun has got low in the heavens. From what I have seen, I think the condition and circumstances of the European and Eurasian officers who live upon and direct the works, during all the months from April to October inclusive, make them fit subjects for commiseration. During all that period their existence is in great measure a struggle against disease, likely to arise from such causes as insufficient shelter, unwholesome water, excessive temperature, and uncertain food supply. Under these circumstances it is scarcely reasonable to expect that they should labour in the open between the hours of 10 A.M. and 6 P.M. And it is very necessary that, whenever a famine relief work is opened, a paymaster should be appointed to a certain fixed number, say every 3,000 of the labourers. The payment of so many, if ten can be paid in a minute, will take five hours' time to complete; and I think one-half of the work-people should be paid in the morning, and one-half in the evening. The paymaster, besides the duty of paying the labourers, should be responsible for the purchase and counting of the necessary pice; and the banias of the works should be required to sell the pice they receive to the paymaster at a fixed rate per rupee, payment to be made by order on the treasury, so that the paymaster may have to send to a distance from the works for as few pice as possible, and may not have to keep much silver on the works; and to facilitate this business of exchange, I think the paymaster's office and the bania's shop should be in close proximity.

The daily payment, and in pice, to each individual seems to me inevitable where the payment is a mere subsistence allowance. If paid by gangs in silver, loss in exchange will probably accrue to the recipients, and it will be quite impossible to ensure that each individual receives his subsistence allowance in full.

Dr. W. Walker.—Any remarks which I have to make on the so-called "wages test" are the result of observations on the diet of prisoners.

2. As a first principle it ought never to be lost sight of that the amount of food required by an individual depends essentially on the labour exacted from him.

3. It is generally agreed amongst authorities in Europe that a European of average height and weight in moderate exertion should have a diet containing a daily allowance of—

Nitrogen - -	300 grains.
Carbon - - -	5,000 „

4. Further, I find that the diet scale fixed by the Prisons (Scotland) Act of last year for prisoners confined in the Scotch prisons is graduated into nine divisions, varying with the labour exacted, the age and sex, from a diet containing only—

Nitrogen - -	123 grains.
Carbon - - -	2,812 „

to one containing—

Nitrogen - -	327 grains.
Carbon - - -	6,268 „

the former being for prisoners sentenced to three days or less without labour, and the latter being ordered for adult male prisoners imprisoned for more than 60 days with hard labour.

5. The labouring diet scale of the prisoners in the jails of the North-Western Provinces and Oudh consists of an average daily allowance of—

Wheat flour - - -	20 oz.
Pulse - - - -	6·4 „
Vegetables - - -	3·5 „

and its nutritive value may be stated as—

Nitrogen - - -	300 grains.
Carbon - - -	4,488 „

6. Now, if it be the case, as is asserted by physiologists, that the quantity of food required by an adult is proportionate to his weight, and if 300 grains of nitrogen and 5,000 grains of carbon be sufficient to support in moderate exertion Europeans whose weight averages 150 lbs., a reduction ought to be made in the allowance for natives proportionate to their weight. What does this imply? I have taken the weights of 20,000 prisoners on admission into our jails, and find the average to be 109 lbs.; so that we may, according to the opinions of physiologists, reduce the scale for Europeans in the proportion of 150 to 109 to find a ratio which ought to support an average native under moderate exertion; this will mean a diet containing a daily amount of—

Nitrogen - -	211 grains.
Carbon - - -	3,633 „

7. As I have said above, the nutritive value of the North-Western Provinces prisoners' labour scale is—

Nitrogen - -	300 grains.
Carbon - - -	4,488 „

Convicts on this diet performing moderate labour gain weight as a rule. The prisons contain a mixed community of workers, part employed in the menial duties of the prison, part in the sedentary occupations of the factories, and a few on the labour of grinding wheat, building works, pulling water, &c., and it is seldom under these circumstances that any man falls off in weight.

8. At the same time I have practical evidence that if prisoners on the above diet scale are kept continuously on really hard labour, involving considerable muscular exertion, it is done at the risk of their losing weight rapidly and finally breaking down.

9. This evidence has arisen during the employment of large bodies of prisoners on the building works of the new prisons—works very similar in kind to the ordinary relief works started in times of scarcity. The labour consists of digging, carrying, and pugging clay, of making and carrying bricks, stacking and unstacking kilns, &c., &c., and the workers are so dependent on each other that if the discipline officer (usually a European) in charge of the gangs does his duty, the whole of the men labour continuously at high pressure. Under these circumstances, in three separate convict prisons I have found it necessary to intermit the labour, to change the gangs, and to increase the daily diet by 4 oz. extra of wheat flour.

10. One series of observations carefully made by Surgeon David Wilkie in the Benares Central Prison may be noted here. They were made on a gang of

439 men employed, as I have described, continuously for five months. These men had the same diet as the ordinary convict sentenced to labour, the nutritive value of which I have before stated to be—

Nitrogen - -	300 grains.
Carbon - - -	4,488 „

At the end of five months 75 per cent. had lost weight, five per cent. remained of the same weight, and 20 per cent. had gained weight. Not only had a large proportion of the men lost weight, but they were much more liable to attacks of sickness than the other prisoners. Thus, the average strength of the prison population during those five months being 2,114—during the first month, of 86 men received into hospital 40 came from the building gang; during the second month, of 95 sick 42 came from the works; during the third month, of 119 sick 58 were from the works; during the fourth, 48 out of 92; and during the fifth month, 30 out of 62.

11. Take another example from the Panjáb, the facts connected with which are recorded at page 11 of the Appendix to the Prison Conference Report for 1877.

12. The ordinary labour diet scale of the Panjáb jails is of higher nutritive value than that which I have described to be in use in the North-Western Provinces; yet when prisoners were sent out to Rupar, and engaged continuously on heavy earthwork, it was found that they very soon broke down. "They lost weight," the superintendent states, "at "the rate of 3 to 4 lb. per man per week." The diet was increased gradually, experimental weighments being carried on, and the equilibrium between diet and work was not established until each man received 10 oz. of wheat flour and 4 oz. of gur daily, *over and above the ordinary labour diet scale of the Panjáb jails.*

It must not be forgotten that the works were only open and wages only paid six days out of the seven; the actual available diet is therefore only six-sevenths of the daily scale I have mentioned above.

It will therefore appear from these facts that the prevailing wages enabled an adult labourer to purchase daily from $7\frac{5}{7}$ chittacks to $8\frac{4}{7}$ chittacks of rice and dál, without allowing any margin for condiments or contingencies, and that they subsisted and worked on this diet for over a month without any visible or appreciable deterioration of their physical condition.

I believe that natives not only can, but that large numbers do, exist on half a seer of raw food per day. Three-quarters of a seer they themselves consider a full diet scale. They regard a half seer diet as insufficient, but admit that it is enough for bare subsistence.

18. My conclusion, therefore, is that if even a moderate day's labour is exacted, the "wage test" should be fixed so as to enable a full-grown man to purchase a daily diet containing not less nutrition than—

Wheat flour - - -	20 oz.
Pulse - - - -	4 „

The value of the above articles of diet may be stated at—

Nitrogen - - - -	255 grains.
Carbon - - -	4,082 „

And I am of opinion that men will be able to do a moderate day's labour on this diet with the usual allowance of condiments and firewood.

19. If, instead of wheat flour, "coarse flour, such as is ordinarily eaten by the people of the locality" (see para. 8 of Chapter I. of Circular No. 51A of 1878), be made the basis of calculation, the nutritive value will fall thus:—

If bájra be the basis of the wages test he will receive—

Nitrogen - - -	211 grains.
Carbon - - -	4,082 „
If juár—	
Nitrogen - - -	1,908 „
Carbon - - - -	4,082 „
If barley—	
Nitrogen - - -	187·6
Carbon - - - -	4,082

20. Notwithstanding these reductions in nutritive value, I am inclined to believe that the 10 chittacks diet scale, with two chittacks of pulse, may be safely adhered to, or at all events that Government is justified in prescribing that diet as a maximum. I ground this opinion on the view that most natives will be able to supplement the allowance with articles of food pressed into service under difficulties, although not ordinarily regarded as food; that Government commits a suicidal policy if it attracts labour to its relief works by an ultra-liberal allowance; and because I believe that in most cases labour on the relief works is very moderate indeed.

21. At the same time I am of opinion that where relief works are continued *over months instead of weeks*, measures should be taken to ascertain by weighments of a certain number of the labourers whether the diet is in reality an equivalent for the labour exacted or not.

Dr. W. Walker.—No reference is made in my remarks regarding the experimental scale of eight chittacks flour plus two chittacks pulse diet for prisoners under sentences of less than a month, because it is still *sub judice.*

Even if it be found that this reduced diet may be safely given to short-term prisoners, it by no means follows that it would be safe to prescribe it as a scale for relief wages. A short-term prisoner in most of our jails is not (from causes into which I need not here enter) subjected to hard physical exertion. Such labour as is exacted from him is given to him *in the jail:* and it is mostly *sedentary.* On a relief work, on the other hand, the labourer has to travel distances varying from 1 to 10 miles in going to and returning from his work, and while at his work he is constantly on the move, digging or carrying less or more earth. Give the labourer eight chittacks wheat flour and two chittacks pulse *at his own cabin door,* and let him spend the day spinning ban or munj or picking wool under the neighbouring pipal tree, and I have no doubt he will exist for a long time on the short diet scale.

Again, in prescribing short diet for short-term prisoners, there is a *punitive element* present which I suppose is not meant to be imported into the consideration of the wages test for a relief labourer. I have found it impossible as yet to provide really hard labour for all our prisoners. In its absence I think it possible to make short terms of imprisonment equally deterrent by prescribing short diet for light labour. Under the daily supervision of a European medical officer this is possible in a jail; but no argument can be drawn from these premises for the introduction of such a scale upon relief works.

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Mr. Magrath.—No contingencies need be estimated for in calculating the ration; condiments are all that are required, and not very much of them. The wages given by us at the beginning of the famine of 1874 were $1\frac{1}{2}$ annas per man, 1 anna per woman (boys above 10 being also paid at this rate), and $\frac{1}{2}$ anna per child. On this they throve with rice at 10 seers, which gave, making a deduction for condiments, one pound and a half, one pound, and half pound for the respective rations. This rate was never altered till the introduction of grain payments, but for a short time Government rice was being sold at 11 seers. The medical men who saw them described the physical condition of the labourers, who had been at work some time, as good, and I think they did well on it. Single men spent their whole wages, but in families where there were several men and a lot of children after a time a pice or so was put by. In Madhubanni the people are rice-eaters, and they had no other food to buy except the Government rice. The price of rice in the case I refer to was fixed by Government. I would, if I were again employed, pay exactly the same wages under similar conditions, modifying it slightly if grain rise or fall.

Mr. Finucane.—In Dinagepore, and, I believe, in the Bengal districts generally, women cannot be induced to resort to relief works. In such districts I would fix wages at such rates as would enable each labourer on relief works to earn a bare subsistence for two persons. The female members of families could be thus supported by the male members on relief works; two and a half annas per day was the rate fixed in Dinagepore. Rice sold at 12 seers per rupee. Allowing three-fourths of a seer per diem per head, two persons would consume daily one and a half seers, or two annas worth. There therefore remained half an anna per day for condiments and other necessaries. Women and boys were paid from four to eight pice a day, according to age and capacity. The labourers receiving the above-mentioned wage were in good physical condition. The following statement shows the amount of money paid in wages and the amount expended by relief labourers in purchase of Government grain in the Patiram circle:—

Month.	Amount paid in Cash Wages.	Quantity of Government Grain sold to relieve Labourers.	Price, at 12 seers per rupee, of Grain sold to Labourers.	Average Number of Labourers.
	Rs.	Maunds of 80 s. w.	Rs.	
April	24,922	6,356	21,186	7,488
May	30,075	7,990	25,633	*5,627
June	17,895	4,719	15,730	4,276
Total	72,892	19,065	62,549	
July August	No cash.	Payments.		

* Decrease in number in May was due to the opening of new circles in the neighbouring thanas.

In Behar, where women resort more freely to relief works, a smaller wage would suffice, and even in Dinagepore I would not, with my present experience, give more than two to two and a quarter annas per day.

Moonshee Ishree Pershad.—Money wages should be given with the consideration that a child between 8 and 16, a woman, and strong man could obtain with it ⅜ths of a seer, ½ a seer, and 1 seer, respectively, of edible prepared grain. There is no need of considering condiments or contingencies, every one will be able to make his own arrangements for condiments and contingencies, if wages be given with regard to the above rates of food.

In special relief works under me, I gave two annas to a strong man, one anna to a woman and old man, and nine pies to a child between 8 and 16. I gave half an anna gratis to children under eight if they attended the works. The price of rice was eight seers per rupee.

Mr. Metcalfe.—My firm conviction is that piece-work at liberal rates, either for gangs or for families, is the proper mode of payment on relief works during times of distress. There can be no mistake in measuring up the quantity of earth-work excavated; and if the labourers are paid at a rate, either in grain or money, sufficient to keep body and soul together, and allowed to do that work choosing their own hours, whether by day or by night, not only are better results obtained, but the really lazy are kept away, and only those in real earnest accept employment. A very fair rate for piece-work is four annas per 100 cubic feet.

Where payment is made in grain the following table may be followed:—

TABLE for CALCULATING the PAYMENTS in GRAIN as equivalent to MONEY.

Money.	If cleaned Rice at 11 seers.	If cleaned Rice at 11 seers.	At 13½ seers.	REMARKS.
Rs. A. P.	Mds. S. C.	Mds. S. C.	Mds. S. C.	
1 0 0	0 11 0	0 12 0	0 13 8	The price for one dhur is reduced to five annas. The figures opposite represent the equivalent in grain; for each lead in tank-work of 50 feet add 1 anna, which at the different rates for different qualities of rice will be either 11, 12, or 13½ chittacks.
0 8 0	0 5 8	0 6 0	0 6 12	
0 5 0	0 3 7	0 3 12	0 4 3½	
0 4 0	0 2 12	0 3 0	0 3 6	
0 2 0	0 1 6	0 1 8	0 1 11	
0 1 0	0 0 11	0 0 12	0 0 13½	
		Ft.	S. C.	
		Up to - 50	4 3½	
		„ - 100	5 1	
		„ - 150	5 14½	
		„ - 200	6 12	

In the Behar famine only rice was served out to the distressed, although in some instances and for some time ⅙th of the rations was paid in money for the purchase of salt, &c. This payment was afterwards stopped, as it was found that, although a district may become entirely shorn of its principal grain during a famine, there is always sufficient dál, musallas, and salt in the hands of banias, and the labourers themselves readily exchange small portions of rice for salt and other condiments. I have already stated that eight chittacks is sufficient for an adult, five for a woman, and three for a child, but in cases of extreme debility milk and sugar may be allowed. My experience is that the condition of labourers on this quantity is good, and the quantity of food sufficient to sustain life without exhaustion. In order to formulate the condition of the wage test, it would be necessary to ascertain exactly the selling price of

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food. Now, in the Behar famine, Government were both importers and sellers during certain periods of the famine, and the wage test was regulated according to the selling price of grain. In a district where grain is in the hands of mahajuns, it would be necessary for a local officer to formulate the rate of wages in proportion to the market price. According to the above table, the equivalent in grain for 100 cubic feet of earthwork, raised within 25 feet of the excavation, would be two seers 12 chittacks; as one man and two women would do this work in a day, they would have a surplus of 26 chittacks for each 100 cubic feet, which would be quite sufficient to sustain the sick and infirm members of the family at home.

Mr. Kirkwood.—My own idea on the question of the amount of wage is that on light-labour works, with women and children only, or almost only, to deal with, a minimum wage, such that the very weakest could earn it, should be a fraction (say one-sixth of an anna) over the price of 1 lb. of good clean rice, or of food equally nutritious. There should be no maximum wage. In Cuttack and Bhagalpore, on the light-labour works, the women were generally 75 per cent. of the workers, children above seven and under 12 years of age 20 per cent., and feeble men 5 per cent. In Cuttack the average wage earned by women per diem was about 5 pice, sufficient for the purchase of 1 lb. of rice (selling at 12 seers per rupee) with three pice, of condiments with one pice, while one pice, more or less, went to the support of an infant child, or was laid aside for purchase of clothing, or for replenishing the baskets, which they had to provide for themselves. This 1¼ anna could be earned by excavating and depositing at the proper spot 20 cubic feet of earth. Occasionally, when on first coming to the works, people were found very emaciated, they were allowed to earn that amount by excavating and depositing 15 instead of 20 cubic feet. This high rate of remuneration was also given generally in July, during the height of the monsoon, when on many days work was impossible. The actual rate generally paid was Rs. 3.14.6 per 1,000 cubic feet; the exceptional rate above noted was Rs. 5.3.4 per 1,000 cubic feet; the average of both together, over the whole period of operations, was Rs. 4.3.0. On these rates the people were found to prosper, to regain strength, and to be cheerful and industrious. The average monthly earning per head on the works was about Rs. 2.6.0, which represents about 19 feet of work a day; more, of course, at the Rs. 3.14.6 rate, aud less at the Rs. 5.3.4 rate. The Public Works Department (in which I include the Irrigation Company) labourers were also paid by piece-work. Their ordinary rate was Rs. 2.4.0 per 1,000 cubic feet. In 1827, with food selling at the Government stores at prices from three to two and a half times the ordinary rates, it was raised to Rs. 3, or an advance of 33 per cent. The contract system was in force (I believe it worked well), and the authorised deduction by contractors for baskets, &c., left about Rs. 2.12.0 with the labourers.

The Public Works Department varied their rates according to the difficulty of the work, the depth of the excavation, the length of the lead. The average rate was as above. We, on our light-labour works, did not thus vary our rates, except when the difficult or easy nature of the work was very marked, the leads very long and tedious, or very short and easy; believing that the work, as a rule, very fairly struck its own average rate. Such work, for instance, as the excavation of the centre of a large tank, or deep digging in a canal was regarded as meriting exceptionally high rates. There were many women and children who preferred working with their male relatives on the Public Works Department works, whenever they were near their villages, to working apart from them on our light-labour works. This drawback to the average out-turn on the departmental works must be borne in mind. The women and children used to carry the earth. Situated thus, each Public Works Department labourer averaged, I believe, about 50 cubic feet per diem, which gave him two annas, or enough for 1½ lb. of rice, a pice for condiments, &c., a pice for clothing, and two pice as a reserve for the repairs of the house, or for his support when he had to betake himself to cultivation. In Bhagalpore wages were paid in grain; and the average monthly earning per head on light-labour works was an amount of grain then worth Rs. 2.4.0. The average out-turn per head was 25 cubic feet per diem. The rate paid was at the commencement 12 lb. of grain (value then 8 annas) per 100 cubic feet. This rate was of short duration and was reduced to 8 lb. (which the selling rates changing, was of an average value of 5 annas), when the people gained in strength and ability to use the hoe. The former rate was slightly less than our Rs. 5.3.4 rate per 1,000 cubic feet in Cuttack, the latter somewhat less than our Rs. 3.14.6 rate. The Bhagalpore rate was subsequently still further reduced. The work was generally lighter in Bhagalpore than in Cuttack, involving less deep excavation and less long leads. The people, to begin with, had not fallen into so feeble a state as those in Cuttack, and there was some experience available which was wanting in Cuttack. The average out-turn was consequently more by one-fourth, which made up for the lower rate of remuneration and left the apparent average cash earning per head almost equal to that in Cuttack. It was, however, if the Cuttack cash earning be turned into grain, the proper standard for comparison, really about 7 per cent. less in comparison with the Cuttack rate than it appears to be, because in the more distressed parts of the Cuttack district in 1867, and the light-labour works lay in those parts, the Relief Committee sold rice at a reduced rate, which, on an average over the whole period, was 14 seers clean rice per rupee. The rate varied from 12 to 16 seers per rupee. In Bhagalpore there was one selling rate general throughout the district. It varied from time to time. The retail rates for clean rice averaged 13 seers per rupee. Thus grain was procurable by the light labourers in Cuttack at about 7 per cent. cheaper than was the case in Bhagulpore. The food daily earning in Bhagulpore was thus less by about 12 per cent. than in Cuttack. I have no precise recollection of the rates given in Bhagulpore in 1874, under the Public Works Department.

Looking back over my own experience, and over all that I have read on the subject, I come to the following conclusions:

(*a.*) *On light-labour works.*—A man or woman should not receive less than a wage which comes daily to the value of 1 lb. of rice, or of grain equally nourishing, and half an anna besides; children above seven and under 12 should not receive less than the value of ¾lb. of grain (as above), and quarter of an anna besides.

(*b.*) *On Public Works Department works.*—A man should not receive less than a wage which comes daily to the value of 1½ lb. of rice, or of grain equally nourishing, with three-fourths of an anna besides.

A woman the value of 1 lb. of grain and half an anna besides.

A child between 7 and 12 the value of ¾ lb. grain and quarter of an anna.

Boys or girls between 12 and 17 the same allowance as women.

Sunday should, in every case, have its own wage, and, I think, its own work. The most strict sabbatarian must think famine relief so good and holy a work that ample sanction is to be found for its full continuance even on the Sabbath. On these proposed rates, I would remark, men and women on light-labour works should get the same rates; for able-bodied women may go to those works, but none but the feeblest men, who neither in strength nor in power of consumption exceed a fairly healthy woman.

Girls above 12 rank as women. No allowance is made for boys above 12 on the light-labour works; but if they are there owing to their feeble condition, they should, if over 15, take as an adult, and if between 12 and 15, as a child.

On no works should any extra allowance be made for infant children under seven years of age. They are not fit for real work. But it is an advantage of the piece-work system that little things of five and six years of age do *something* to increase their mothers' earnings, though they are not shown as units in the total number of light labourers. Their support should be left to their relatives, who will certainly save enough for them with such a rate as that proposed. To give them a special allowance is to open a door to much fraud and many abuses most difficult of check. The only exception should be widows with more than two such infants; her surplus number should then be borne on the village gratuitous relief lists.

On Public Works Department works men should draw more than women. The women, except professional earth-workers, should only be there by choice, as they should have the option of going on to the light-labour gangs. That is not the case with the men. Similarly, too, all children under 12 would only be on such works by choice. They should therefore get the same as on light-labour. Not so with boys between 12 and 17, who should be on the Public Works Department works, and not on the light-labour. They should get the same as a woman. On all works (under the daily-wage system) a full daily allowance should be given on those days when rain may render work impossible.

Further, in that case, whether daily wage or piece-work is the system, the ordinary rates of each district should be taken as the basis of calculation. I would in that case have the Public Works Department labourers' ordinary rate in any district increased by 25 per cent. whenever grain is from two to two and a half times its normal value. I would not (as was, I believe, done in Bombay) decrease the nominal or real work exacted by 25 per cent., the ordinary wage being maintained. When grain reaches about four times its normal rate, the ordinary Public Works Department rates should be increased by 50 per cent. But it is my strong belief that Government should always take steps to secure the price of food being not higher than treble the ordinary price. With food obtainable at that rate, the ordinary wage should be increased about 33 per cent. Then for light labourers (they will have no existence until the price of food is high) the rates paid should be about 50 per cent. in excess of the Public Works Department rates current from time to time. In Cuttack, with grain obtainable by our light labourers at 12 to 14 seers per rupee, about two and a half times its ordinary price, the ordinary Public Works Department rate of Rs. 2–4 was increased on our light-labour works to Rs. 3.14.6 (exceptional rates apart), or 75 per cent., with the results above noted.

Mr. Kisch.—Labourers will, if they can, purchase that grain of which they can procure the greatest quantity. The labourers of the ceded districts are not accustomed to live on rice, but during the greater part of the famine rice was cheaper than any other grain, and the labourers bought it. When cholum and other grains became much cheaper than rice the labourers returned to their ordinary food. When wheat was the cheapest grain procurable it was sold to the labourers in very large quantities. When much labour is required in order to grind any particular grain and make it fit for food, its price must be appreciably lower than that of other grains to induce labourers on relief works to buy it. Cholum (jowari) was used by the people of the ceded districts in their own homes as soon as it became cheaper than rice. Those on relief works who had to buy or bring from their homes the grindstones required to grind the cholum, continued to eat rice even when its price was considerably higher than that of cholum.

If the wage sufficies, a labourer will purchase the amount of grain necessary according to the first assumption made above. He will stint himself in condiments and contingencies rather than not procure the full amount of grain required. If he can get the full amount of grain necessary according to my assumption, he will spend half or a little more than half the remainder in condiments and firewood, if he cannot himself procure the latter readily. The remainder of the wage is for contingencies. A labourer should be able to save a pie or two a day even out of the relief wage. It may save him or his wife or child from starvation when from sickness or some other cause he cannot come to work and cannot manage to get gratuitous relief. It will enable him to live for a few days after the work is closed, and if required for no other purpose it will enable him to buy a few mats to make into a hut on the relief works during the rains, or allow him to purchase a new blanket or cloth after he has been on the work for two or three months.

Mr. Hughes.—Questions 6 to 11 will be best answered by relating my own experience on the Maraudahully project in the Durampury taluq.

This project consisted of a canal about four miles long, 50 feet base, and 8 to 15 feet deep. The number of coolies employed on it varied from 3,000 to 6,000. The organization I adopted was as follows:—

An overseer was appointed to every 1,000 coolies, and a head-cooly to every gang of not less than 50 or more than 100 men. Each gang had a chain of channel. The length of an overseer's charge did not exceed half a mile.

Along the line of canal at intervals we had their workshop bells placed. The first bell rang at a quarter to six. The nominal rolls were then made over to the head-coolies by the overseer. The coolies as they arrived fell in in line on their respective length, and the roll was called by the head-cooly and marked. At six o'clock the bell stopped, the coolies broke off to work, and the head-coolies delivered their rolls to the overseer to be abstracted. At twelve o'clock the bell rang for breakfast. At two o'clock the roll was again called; coolies not arriving to time were marked absent for the half-day.

The overseer and head-coolies were present on the works all day during work hours.

The work was measured up daily, and a report sent in to me by the overseers daily, showing the number of coolies and their distribution as diggers, fillers, and carriers, the distance of lead, the height lifted, and the cost of the work.

The rates were generally from three to five times ordinary rates. The head-coolies were held responsible for a proper out-turn from the gangs; the overseers exercised a general check, and were also responsible for measuring the work, for a proper distribution of labour, and for frequently checking the nominal rolls. When the work was more than usually short, the head-coolies were punished by reprimand, fine, or dismissal. With all these precautions, and with all the driving I could exert, I found the cost of the work was very heavy as compared with ordinary rates. Among others, the chief reasons were:—

The large number of carriers (women and children) to diggers and fillers, that is, men to dig the earth and fill the baskets, and the consequent difficulty of distributing the labourers with reference to the nature of the soil and the lead. In some cases women were employed to pick and fill, and several gangs composed entirely of women were formed. At another time we could not get baskets made quickly enough to meet our requirements. The coolies were told the tasks which would ensure their getting paid at full rates, but I never succeeded in getting them to work up to them.

In one word, my experience is that it is not possible to task efficiently large bodies of work-people exceeding 2,000 or 3,000 paid on nominal rolls. All that can be done is to enforce a certain amount of system and discipline. This applies to my experience in Madras, where the subordinates were untrained lads fresh from college.

Practically it was found sufficient to pay the coolies once a week. New arrivals in the probationary gangs were paid daily by the overseer for the first week; it was found that after a week they could manage with weekly payments.

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The payment of the gangs was the work of a whole day, and Sunday was always pay-day. Payments were made in the following manner :—

The coolies were made to fall in in lines on a convenient piece of ground, each gang under its head-cooly, who was furnished with the nominal roll for the week, checked and signed by the overseer.

The inspecting officer (who was always an engineer) then fixed the rates at which the coolies were to be paid with reference to the work done, checked the number of coolies in each gang, told the coolies the rates at which they were to be paid, and why they were fined, and thus passed the roll for a certain stated amount. A number of cashiers (generally about one to every thousand coolies) were present, and they paid each gang in turn, producing the passed nominal roll as a voucher.

Perfect silence was enforced in the ranks. The coolies were not allowed to leave the ranks while payments were in progress, and directly they were paid they were made to leave the ground. Absentees at time of payment forfeited their dues, unless they were in hospital; and complaints were heard and decided on the ground by the officer in charge of the payments.

Under this system innumerable instances of fraud were discovered;* whole nominal rolls had been forged ; villagers were brought in to personate coolies for the day, &c. I regret to say that it was found so troublesome to prosecute these cases in the magistrate's court, some thirty miles off, that most of the offenders escaped punishment. As a rule, the officer in charge of large relief works should have the powers of a committing magistrate, to enable him to deal with these cases.

A system of ordinary piece-work should be adopted as much as possible, and the coolies should be paid for work done at rates fixed with reference to their physique, the nature of their usual occupation, and the price of food. The headmen of a gang should be allowed a commission of an anna in the rupee, and the coolies kept informed of the rates at which they were paid, and of the proportion to be deducted from their earnings by the gangmen. Any infringement of these rules should be promptly dealt with in the presence of the whole gang. All able-bodied persons should be employed on piece-work, and paid for work done. Gangs paid at daily-labour rates on nominal rolls should be reserved for emaciated and weakly persons and women.

Mr. Brookes.—I have not much experience with the wage test, as on the duty that I have been I have always been permitted to adopt the piece-work system. The daily-wage system *is the worst and most demoralizing that can be resorted to,* and it never succeeds.

When labourers know that their wage is fixed they study to do for it as little work as they can, and it requires a very large establishment to get from them even half a day's work for a full day's pay.

Fining is useless, and very objectionable, as the petty subordinates have to inflict the fines, and this gives them a dangerous power to turn to their own advantage.

The only effect of enforcing fines on daily labourers is to deprive the labourer's family, or, if he has no family, he deserts for a more liberal paymaster.

In the Orissa and Bengal famines the ordinary normal rates for work were paid with an increase in proportion to the enhanced prices of food-grains.

When labours earn full wages their consumption of rice is from $1\frac{1}{2}$ lb. to 2 lb. per diem for each adult, with from two to three pice for condiments, firewood, &c.; children from seven to twelve years of age, $\frac{1}{2}$ lb. of rice, and condiments in proportion. Ordinary coolies, as a rule, seldom get more than 1 lb. of rice per diem, and they can live on this with the usual allowance of condiments.

The price of the standard kind of food is taken at the local market rate when a money wage is paid.

I should say a fair day's wage for a full day's work would be $1\frac{1}{2}$ lb. rice + two pice, which would generally represent about two annas ; half the amount for children between seven and twelve. But I would only allow daily wages for the first three or four days after admission to the relief works, and then only if necessary.

Baboo Hari Mohan Chandra.—Food.—Adults must have at least $\frac{3}{4}$ seer of 80 tolas per day, children $1\frac{1}{2}$ powa of 80 tolas per day, with some extra allowance for condiments, &c. In years of plenty the adults and children take not less than one seer and half a seer respectively a day. By doing task work, each able-bodied man earned not less than 3 annas, some 4 annas a day, and children of 14 or 15 years, 2 annas a day. Each labourer earned on an average 3 annas per day; and taking one wife and one child who had to be fed by each labourer, we have 3 annas for two adults and one child. Rice was sold at 12 seers of 80 tolas the rupee in 1874, $\frac{3}{4}$ seer for each; for two, $1\frac{1}{2}$ seer, equal 2 annas; $1\frac{1}{2}$ powa for a child about six;—in all, rice for three as above equal 2 annas and 6 pie, leaving two pice for condiments, &c. Coarse rice was purchased by the labourers. The wages should be only sufficient to buy food actually required to support life, with a margin for condiments and contingencies.

Mr. Lowis.—In my instructions to my circle officers I directed the enforcement of a labour test, the work done being paid for according to a fixed standard. In one circle the officer in charge could not, he said, enforce the labour test, giving various reasons for his inability to carry out orders; the result was that the numbers on his works increased so fast that it was evident that men were being paid for doing nothing. At length my orders were enforced, the labour test introduced, and at once the numbers fell. The pay may be reduced to a bare subsistence, but there will always be a certain number of idlers attracted, who, in spite of every effort, will get paid for doing comparatively nothing. I have no proposal to offer as to the conditions under which the wage test may be applied, as I am quite convinced that it is no true test of real want. It is almost, in fact perfectly, impossible under it to prevent persons getting paid for doing no work at all, or, at best, a very unsatisfactory amount of labour.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.—

Men - - -	$1\frac{1}{2}$ lb.
Women - - -	1 lb.
Boys from 15 to 12 -	
Girls from 14 to 11 -	
Boys from 12 to 8 -	$\frac{3}{4}$ lb.
Girls from 11 to 8 -	
Children - -	$\frac{1}{2}$ lb.

I should always expect the people to group together and assume the relation of members of a family, in fact share in common. I should expect them to maintain their children and those who fell temporarily sick and those who could not work from infirmity. Therefore I should roughly aim at giving each earner a trifling margin for such contingencies. That is, I allow them just what I think they would consume in ordinary times, and they would have to pinch themselves a little to meet casual calls.

I should also give a margin, always given in cash, of one pice a head each day for salt and condiments and fuel.

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* In several cases the head-coolies forcibly took away some of the coolies' earnings directly they left the ground.

BOMBAY.

Mr. Hewlett.—I think the standard diet scales for prisoners in jails are very good guides as to the quantities of food to be given to labourers. These are as follows :—

	Bajree, wheat.	Jowaree flour.	Dhall.	Vegetables.	Salt.	Condiments.	Oil, sweet.	Cocum or tamarind.	Animal food.	Fuel.	REMARKS.
	lbs.	oz.	oz.	oz.	drs.	drs.	oz.	drs.	oz.	lbs.	
Long term prisoners on *bonâ fide* hard extramural labour.	1	8	5	8	6	8	1 drs.	8	5	1	The meat is given from once to thrice a week in lieu of dhall, dependent upon the season of the year and work on which the prisoners are employed.
Long term prisoners on intramural medium labour.	1	4	4	6	6	4	4	8	4	1	
Prisoners sentenced to hard labour for three months and under, simple imprisonment, under trial, women and juveniles.	1	3	3	6	6	4	4	8	4	1	

but during the late famine Government never laid down any dietary. For labourers employed under the Public Works Department the rates of daily wages were at first fixed at 2 annas for a man, 1½ annas for a woman, and 1 anna for a boy or girl old enough to be able to work, but subsequently a sliding scale was introduced by which the rate of wages increased when the staple food grain became dearer than 16 lbs. for a rupee.

A man was paid at the rate of 1 anna *plus* the value of 1 lb. of grain.

A woman was paid at the rate of ½ anna *plus* the value of 1 lb. of grain.

A boy or girl was paid at the rate of ½ anna *plus* the value of ½ lb. of grain.

In addition to the above, an allowance of 3 pies per head for children under seven years of age was given. These wages were paid for six days during the week. No work was demanded and no payment was made for the seventh day.

There never was, during the whole period of the famine, the least anxiety felt about the condition of persons receiving this rate of wages. They steadily improved upon it. If weakly when first received on to the works, they speedily recovered and kept well and strong on it. For labourers on the Civil agency works there was a reduced scale of wages, as follows :—

A man was paid ½ anna *plus* the value of 1 lb. of grain.

A woman was paid ¼ anna *plus* the value of 1 lb. of grain.

A boy or girl was paid ¼ anna *plus* the value of ½ lb. of grain.

In addition an allowance was made of 3 pies per head for children under seven years of age. These wages were only paid for six days.

There was no work and no pay for the seventh day.

Before this scale of wages had been fixed by Government, power had been given to district officers to treat exceptional cases in an exceptional and special manner.

Shortly after the rates came into force I travelled through the Belgaum, Dharwar, and Kaladgi districts, and from what I saw in the latter (where however I subsequently learnt that the instructions of Government regarding expenditure in charitable relief and for the relief of young children had been neglected,) I reported most strongly against the continuance of the rates, and urged that at all events a seventh day wage should be given, but on visiting civil agency works in other Collectorates where the orders of Government had been fully carried out I was constrained to report that the people on Civil agency rates were in as good case as those on Public Works rates, and that they obtained sufficient food to prevent wasting. Subsequent and anxious inquiries into the matter confirmed me in the conviction of the sufficiency of the Civil agency rates for the class of people who come on to these works, and there can be no doubt at all that they were sufficient, *provided* that care was taken to supplement the rates by the treatment of special cases, and by careful attention to seeing that the allowance for young children was drawn and distributed.

The general run of people on the Public Works rates were healthy labourers, mostly in the prime of life, with their families, but on the Civil agency rates, the old, infirm, and less physically capable were employed. The very large majority of these people had private means of their own, with which they supplemented the rate.

In judging of the physical condition of the people, I always took as my standard the condition of the children and young adults, because if they were not wasted, I felt certain that they were obtaining sufficient food to keep them in health. On all the works there were, as will be seen in years of the greatest plenty, old men and old women who, as all old men and old women among the labouring classes in this country always are, were lank, thin, and withered; but taking the condition of the young children and young adults as my standard, I was able to say that I considered the food obtained was sufficient to keep them in health and well nourished.

It was the universal experience of the district officers that strong people remained strong and that weakly and emaciated people recovered strength and flesh on these rates. All who required it on first coming on to the works were made special cases of, but to carry this principle out there must be European officers. Native officials, as a rule, in my experience, have not the training or the experience in matters of detail or the power of organization that is essential for carrying out the system.

During a part of the famine, when the price of grain rose so high that only 9 lbs. and under could be purchased for a rupee, the seventh day wage was permitted without work both on Public Works Department and Civil agency relief works. This was a boon highly appreciated. I think myself it should be allowed when the price of staple food reaches 12 lbs. for a rupee. Otherwise I do not think that the conditions of the wage test could be improved, always remembering that they must be supplemented by the treatment of special cases and the payment of the children's allowance. This and European supervision are, I believe, the great reason why in the Bombay Presidency this system was found to answer; but I should add that all persons on civil agency rates should be paid daily and those on Public Works rates biweekly, although even on them the new-comers should be paid daily for some time. Regular daily payment is a most important element of success.

Colonel Jones.—I consider that the condition of the labourers employed under me on the sliding scale of wages was fairly good, and that the wages were not high enough to make our works too attractive.

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BOMBAY.

The labourers purchased bajree and jowaree of an ordinary quality. I have no reliable information as to the quantity purchased by the labourers.

The mamlutdars supplied the officers in charge of famine works weekly with the prices of the staple food in their talukas.

General Wilkins.— The wages paid to famine labourers during the late famine were in strict accordance with the sliding scale ordered by Government. This scale was a good one in practice, as in general a man's wages gave him the price of two pounds of grain.

I consider the price of two pounds of grain the proper wages for an able-bodied labourer, and I would formulate the conditions of the wage test on that basis, and regulate the women's and children's wages in the same way.

The famine wages paid during the famine were, as a rule, sufficient for those who were able and willing to continue steadily at work, and who were not hampered in their means by having families with them. Young children were drags on their parents, as they received but a quarter anna, which, in my opinion, was insufficient for their support when suckling infants with impoverished mothers, and also when of more advanced growth up to seven years. Fortunately the poor-houses came in to the aid of the children, and the officers engaged in the districts were particularly careful of the welfare of all the children who came to their notice.

I recommend the following table as a basis on which a scale of wages should be formed :—

Wages.	The price of
Man - - - - -	2 lbs. grain.
Woman - - - -	1½ lb. „
Boy or girl, 7 to 14 years - -	1½ lb. „
Subsistence Allowance.	
Boys or girls, 3 to 7 years - -	1 lb. grain.
Infants - - - -	½ lb. „

The local civil authority gave the price of the standard food once a week.

Mr. Propert.—To the best of my belief, the scale of wages ultimately adopted by the Bombay Government during the late famine was sufficient and at the same time not too liberal. In Khandesh the labourers as a rule did not arrive upon the works in a state of actual starvation, and the wages allowed under the management of the Public Works Department were apparently sufficient to enable the workmen to subsist without difficulty.

The price of the standard kind of food on which the wage was based was ascertained from the weekly return of prices submitted by all taluka officers. I cannot recommend any change in the rules regarding wages laid down by the Bombay Government.

Mr. Spry.—During the last famine I have inspected very many thousands of relief labourers both in this district and in Ahmednagar. Large numbers of these I have inspected periodically and frequently, so that I should have noticed any falling off. In these inspections I have often been accompanied by medical men. My experience is that, provided a man came on to the work in good health and was not attacked by any specific disease, his physical condition did not deteriorate on the famine wage given in the Bombay Presidency, viz., the price of 1 lb. of grain and one anna in cash per diem. Cases of emaciation and of physical weakness often were found, but on inquiry they could always be traced to causes other than insufficiency of wage.

The labourers, as far as I could ascertain, generally purchased either jowari or bajri, whichever at the time might be cheapest; but sometimes they would purchase gram, which had a pernicious effect. A little gram eaten would with copious draughts of water caused a feeling of satiety for the time, but would afterwards bring on bowel diseases which often proved fatal. This gram-eating was carried on, I believe, in many cases for the purpose of saving money, not because the wage was insufficient, and would have been in vogue even if the wage was higher. How they managed it is best known to themselves, but it is an undoubted fact that some did save out of their famine wage, which certainly goes some way to prove that it was sufficient.

The revenue officers ascertained the price of food at the places where the work happened to be, and upon that the wage was based.

I think the wage test as it has been applied in the Bombay Presidency has stood its ground. I would not advocate any other; only that I think that when famine becomes most intense, as it did here, when grain rose to 8 lbs. per rupee, and the money value of the cash payments became less, the Sunday wage should be given in addition to the week days.

My above remarks apply equally to Civil agency as to Public Works Department works, only with the people on the former it was more difficult to judge, because they would not be so strong as on the latter when they first came on. Nevertheless, although the wage was half less in the cash payments, these people did not deteriorate, indeed many improved and were eventually drafted on to Public Works Department Works.

Mr. Charles.—My experience seemed to show that the wage of 1 lb. grain, plus 1 anna, was enough for the *healthy* labourers who could work uninterruptedly, especially during the rains, when all kinds of wild vegetables could be had. But it allowed no margin for accidents, fines, mistakes, and illnessess, and much distress was caused, I think, among women with many children by the rate for children under 7.

I noticed that the condition of labourers who had been working in the east, where there is no jungle, improved very much within a few weeks after they came to Kalghatgi. This improvement seemed due to the wild vegetables and salads which they were able to gather to supplement their rations.

Another point is, that the persons being paid the bazaar price of 1 lb. of grain, by no means always were able to get grain at that rate. Many of the people had no cooking pots, or were unable to get firewood, and I saw numbers of people buying ready-made cakes of jowari, which used to be sold by villagers at rates perhaps more than double the nominal bazaar rate of jowari.

I should have liked to see the rates given as finally settled, with the following changes:—

(1.) Wages on Sundays as usual.

(2.) Children under 7, double the rates they were allowed.

(3.) No fines amounting in any one week to more than one seventh of the total which would have been earned had full pay been given.

Mr. Moore.—The rates of wage were, in my opinion, sufficient, and the labourers who received them were generally in good condition.

The price of the standard kind of food on which the wage was based was ascertained by inquiries made by mamledars or aval karkuns in the nearest market.

Mr. Hamilton.—The wage question is more difficult. I believe that 1½ pound of grain is ample to keep men in good working condition. I am quite opposed to the one pound theory. I do not think any actual deaths from starvation occurred amongst the labourers under me to whom only one pound of grain was given, but they had no strength to work properly, and the birth-rate was abnormally low.

Mr. Percival.—The wages test should be a minimum low wage dependent on the price of grain; it should be sufficient for weak peple on moderate work to improve in condition; it will not be enough for a strong man on hard work, and he should be allowed to gain extra pay for extra work. The majority of the labourers should be able to earn extra pay. The market price of grain is publicly known, and cannot be much falsified; only care is required that the quotation is for the cheap grain consumed by the common people, and not for best qualities. The minimum wage should be the value of 2 lbs. of such grains as jowari or bajri for a man, 1½ lbs. for a woman, and 1 lb. for a child from 7 to 12 years for six days in the week, and an allowance of three pies for each infant. Out of this a very small part indeed will be expended in condiments. The Civil works wage of 1 lb. of grain and ½ anna for a man was, in my opinion, insufficient when prices were high. People could live on it, but something more than that is required if they are expected to do any work.

Colonel Anderson.—I have a very strong conviction that the Bombay scale of wages adopted in the late famine is full and ample, *if the people actually get it*, both on Public Works and for Civil relief. In the former the labourers in Bombay generally saved something, and as regards the latter, the money equivalent of 1 lb. of grain, plus ½ anna, the infirm elderly people, who would form a large class of the recipients, were much better fed with this allowance than it is probable they had been in their own homes. This money, equal to 1 lb. plus ½ anna, with no Sunday wages, I consider, from investigation, to be about equal, with grain at 16 lbs. per rupee, to two thirds of the amount an ordinary hale labouring coolie would eat when on his ordinary daily work in ordinary times, and therefore sufficient for people of the kind who would come on this form of relief, which involves no work, or only work of a very light kind.

Mr. Robertson.—This question is divided into two main heads:—

Public Works Wage.
Civil Agency Wage.

1st.—*Public Works Wage.*

When works were first opened, the following scale of wage was fixed by Government Resolution, No. $\frac{166}{792}$, of 4th November 1876:—

A man per diem - - -	2 annas.
A woman do. - - -	1½ „
A child capable of working -	1 „

I was at that time Collector of Dharwar, and finding the above scale did not suit, I recommended that the rate of wage should vary according to the price of grain, with a small cash payment for condiments, &c.

In Government Resolution No. $\frac{186\text{ C}}{827}$, of 15th November 1876, it was ruled that the rates in Government Resolution of 4th November should be allowed if grain was procurable at not less than 8 seers of 80 tolas each, or 16 lbs. per rupee.

Also, that when the ordinary food grain was selling at less than 8 seers of 80 tolas each or 16 lbs. labourers should be paid.

A man to receive ½ a seer, weighing 40 tolas or 1 lb. of grain, or its equivalent in money, and in addition one anna in cash.

A woman, ½ seer, weighing 40 tolas or 1 lb., or its equivalent in money, and ½ an anna additional in cash.

A boy or girl capable of working, ½ seer, weighing 40 tolas or 1 lb., or its equivalent in money, or, at the option of the directing officer, ¼ seer, weighing 20 tolas or ½ lb., or its equivalent in money, and ½ an anna additional in cash.

This scale was modified by Government Resolution, No. $\frac{268}{1038}$, of 13th December 1876, which ruled that when grain was not less than 18 lbs. per rupee, the scale of Government Resolution of 15th November should remain in force.

This wage, it is to be specially noticed, was for the six working days, and no wage was paid for the Sunday.

My own experience is that the Public Works wage is amply sufficient to sustain life and to keep the people in fair working condition, especially if they come on to the works before they have become enfeebled and out of condition. This is, as far as I know, the opinion of most officers who were serving under me in the famine, though at the same time I believe one and all concur with me in the opinion that the wage was not more than sufficient, and that the Sunday wage should have been granted. I have been unable to understand any valid reason for not granting the Sunday wage. Sunday was a day of marked privation to all who daily had large appetites, and could not put something by for the Sunday.

Of course, one day's starving in the week could not fail to have a bad effect. At all large works there were many hangers-on to the bread-winner, people who either could not or would not work, and who, till brought to a very low state of distress and emaciation, would not go to the relief-houses. Eventually these people came on our hands in bad condition, requiring all kinds of special treatment and extra expenditure. I feel, and have always felt, that had the Sunday wage been given it would have been of such aid that much of the extra distress would have been avoided or lessened, and that the Sunday wage would have been money well expended. I have never taken any steps to ascertain the quantity of food purchased. I know that, except in very rare instances, all the cash that was received was expended on food. In places where during the season there had been occasional rain, wild vegetables sprang up, and were obtainable; then the people, by making use of these, were, in a few cases, able to put by a few annas. The staple grains used all over the country are bajri and jowari. In each taluka there is a mamlatdar or head revenue officer, and he on a fixed day in each week supplied the officers in charge of the work with the actual market or bazaar rate of grain.

On all large works a number of people would arrive in bad condition, people still able to work, but still in bad condition. Some, the strong ones, would rapidly improve, the weak ones very gradually, and in some cases with great difficulty.

For some time I have been led to believe that the slowness of recovery of condition was not owing to the insufficiency of the wage and food, but to the method of cooking. The people were not in a condition to digest and assimilate the hard chapatis they made.

This is a point of very great importance, requiring careful examination by competent medical officers.

I have heard that in Kaladgi, when the people were fed on jowari porridge, famine dysentery decreased, and the dreadful foul smell always found where there was a collection of famine-stricken people disappeared. This question calls for careful investigation.

With my present experience, I would, as regards works under the Public Works Department, adhere to the wage rate laid down by the Bombay Government in Government Resolution No. $\frac{186\text{ C. W.}}{827}$, of 15th November 1876, and in Government Resolution No. $\frac{268\text{ C. W.}}{1038}$, dated 13th December 1876. But I would add thereto the Sunday wage.

And, further, as regards all persons coming on to the work in bad condition, they should be ganged separately, and steps taken to secure that their food should be made up, not into chapatis, but into porridge or pudding, till such time as they had improved in condition and were able to be transferred from the bad condition gang.

2nd.—*Civil Agency Rates of Wage.*

The rate of wage on civil agency works was laid down in Government Resolution No. $\frac{33\text{ E.}}{103}$ of 19th January 1877.

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A man, $\frac{1}{2}$ an anna and the value of 1 lb. of grain.

A woman, $\frac{1}{4}$ anna and the value of 1 lb. of grain.

Boys or girls employed on the works, $\frac{3}{8}$ of a seer of 80 tolas of grain, or, at the option of the directing officers, $\frac{1}{4}$ anna, and the value of $\frac{1}{2}$ lb. grain.

Children under seven years of age received an allowance of $\frac{3}{4}$ of an anna per diem, but did no work.

Here also the Sunday wage was not permitted.

The work exacted was naturally light, and the people managed to live on the rates. On the whole, most officers reported that the rates were fair and reasonable, though all, I think, would have felt that a fair and much needed addition had been made had the Sunday wage been given. This Sunday wage was, in my opinion, most essential, but Government did not think proper to concede it.

That the six days' wage was of itself not absolutely sufficient is clear from its having been necessary to permit exceptional treatment. Mr. Percival, the Collector of Sholapur, wrote:—

> "As a whole, I think the civil rates, modified by grants of extra allowance to nursing mothers, and with a little straining the point as to when boys and girls should be counted as men and women, and with payment as charity through the village officers to work-people temporarily unfit for work through illness, have proved quite sufficient to keep the people alive and in health, though not to fully satisfy their appetite, or to keep their strength up to its normal point in an ordinary year."

Mr. Norman, the Collector of Poona, wrote:

> "It seems to be the general impression, in which I concur, that Civil agency rates have proved sufficient for the maintenance of the old and infirm and such persons as are incapable of performing a fair day's work.
>
> "3. On the other hand, it must be remembered that the orders of Government under which special allowances could be granted to all persons in need of such assistance have been freely made use of."

My own opinion is that the rates were sufficient to keep people alive, but not more than that.

Mr. Robertson.—There is no alteration that I would propose to improve on the famine policy adopted in Bombay as modified and gradually improved by the end of the famine; and I would recommend adopting that policy unaltered, with the exception that I would give the Sunday wage, or seven days' wages in the week, on both classes of works. I quite admit that the people did pick up and improved in condition on the works, but they had a day's starvation every week. There were cases of deterioration; but these were not the general rule. I do not know of any case of people breaking down under the system of works and taking refuge in charitable relief. But all medical evidence of experts went to show that a larger amount of grain was required for seven days than that which the people could buy on the six days' wage. On the other hand, the Sanitary Commissioner certainly admitted that the wage kept the people in sufficiently good condition. The people on Civil Agency works, however, did not improve, at least not much. They were such a poor class, and so emaciated that it was difficult to say whether they did improve or not. I have no doubt at all that, on these works at least, to have given the Sunday wage would have been a vast improvement, and have materially hastened their recovery. To have done this would have perhaps tempted people off Public Works to Civil Agency works; but strict supervision would at once send them back again. I think, too, that granting the Sunday wage would lessen the charges for charitable relief; strong healthy people would be able to help weaker members of their family, instead of sending those members to relief-houses, and thus families would not be broken up.

Mr. Bosanquet.—I may preface my remarks on the wage test by saying, with all respect, that I consider it to be objectionable in every way, and altogether wrong in principle. If people are ready to work as they ought to do, why not pay them fairly?* The wages allowed, as is well known, on the famine works throughout the Bombay Presidency were as follows:—

On Public Works.

Men	1 anna	+ 1 lb. of grain		G. R. No. 268 C. W. 1038, of 13th December 1876.
Women	$\frac{1}{2}$,,	+ 1	,,	
Children	$\frac{1}{2}$,,	+ $\frac{1}{2}$	,,	

On Civil Agency Works.

Men	$\frac{1}{2}$ anna	+ lb. 1 of grain		G.R. No. 33 E. 103, of 19th Jan. 1877.
Women	$\frac{1}{4}$,,	+ 1	,,	
Children	$\frac{1}{2}$,,	+ $\frac{1}{2}$	,,	

Children of people on the works under 7 years of age were paid $\frac{1}{4}$ of an anna daily under G. R. No. 312 C. W. 1116, of 26th December 1876.

I have no hesitation in saying that these allowances were entirely insufficient, and that to their introduction is to be attributed the greater part of the mortality which occurred.

The amount of food which is necessary to sustain life in a healthy condition is not an abstract question which can be decided off-hand for every individual. The question to be considered is what a person has been hitherto accustomed to. If a man has lived for years on, say, eight "breads" or chapatis daily, and you suddenly reduce him to four and keep him on that for months, you must reduce his physical condition to a very injurious extent and put his life in imminent danger. Soon after the famine closed, the allowance for each man in the jail was reduced as follows as an experimental measure:—

	Old rate.			Experimental rate.		
	lb.	oz.	dr.	lb.	oz.	dr.
Jowari flour	1	8	0	1	4	0
Toor dal	0	5	0	0	3	0
Vegetable	0	8	0	0	6	0
Salt	0	0	6	0	0	6
Oil	0	1	0	0	0	4
Fuel	1	0	0	1	0	0

In a very short time it was found that the prisoners became reduced in weight, and it became necessary to raise* the allowance to the old rates. Now if persons having all the advantages prisoners have could not live on the reduced scale just mentioned, how could it be expected that famine labourers could live on much lower rates, no wages being paid for the Sunday?

Even, however, supposing it was possible for the distressed persons to support life on the allowance permitted to them, this very low rate was objectionable, for the reason that many persons would not accept work upon it. They said, "better starve at "once and end our misery, than go for months in a "starving condition." The consequence was that many people able to work persistently refused it. When much reduced by want they had to be received gratis into the relief-houses for a time, and when better had to be turned out again, only to be re-admitted again soon afterwards. Of course the privations which such people suffered, no doubt a great deal from their own contumacy, produced in time a very injurious effect on their constitutions, and in many cases led to fatal results. I cannot, however, but regard it as something very like cruelty to expect people to work through a great part of the day and under an Indian May sun on a diet obviously quite insufficient. I may observe that, considering the appetites that growing children have, the allowance for those under seven as above mentioned was certainly inadequate. As Civil agency works were discontinued in this district at a comparatively early period,* and as I did not have much opportunity for observing the physical condition of the labourers, I have little to say about their external appearance. They did not give me, as far as I can remember, the appearance of persons in a starving condition; but it must be borne in mind that external appearance of a person is scarcely a safe guide to go by in determining whether he is in danger of dying from starvation or not.

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* See note, page 147.

It is asked, "what have you ascertained as to the "actual kind and quantity of food purchased by "labourers with their wage?" This question can be better answered by others; but I believe that sometimes labourers with a desire of saving, and also with the object of assisting their infirm relations, lived a good deal on leaves and roots. The price of the standard kind of food was ascertained by the mamledars by inquiry in the local markets. My answer to the last sentence of paragraph 6 is, with all respect, that I believe for the reasons above explained the "wage test" as adopted in the last famine to be objectionable from every point of view, whether of justice, of humanity, or of good policy.

[*Note.*—As Mr. Bosanquet's opinions are at variance on some important points with those of most other officers, I thought it necessary to ascertain from him how far they are based on personal observation. I print below an explanatory memorandum which he has given to me. I have also had an opportunity of questioning him personally, and give below the substance of what he stated to me, from a note which I made at the time, which I read to him and in which he concurred.

Mr. Bosanquet said that the only large work he visited was the Gokak Canal, which he visited once, in April or May 1877. He did not on that occasion make any special observations of the labourers. He went there one morning and walked round. The people looked all right. He did not adopt any measures to examine the people; did not call them up for inspection. He did not observe any persons on the P. W. wage to show signs of famine, but concluded the wage was insufficient from knowing that a man cannot live on two breads a day. Did not bring the insufficiency of the wage to the notice of Government, because it was the subject of much public discussion by high officials. Began to hold his views more strongly when he saw the people dying. Did not take any case of a man who was dying in a relief-house and trace his history back to the cause of his becoming emaciated or sick. Is not prepared to state as within his own knowledge that the large increase of people on charitable relief in September and October consisted of people who had come off public works. J. B. P.]

Mr. Bosanquet's Memorandum, dated October 8th.
Note upon the Wage Test.

I have already, in my letter No. 2488 of the 19th September, stated some of my reasons for believing the wages which were allowed to have been inadequate. In paragraph 13 of that letter I have stated that so far as I had opportunities of seeing the labourers personally I did not observe them to have suffered in physical condition; but I have also remarked that I do not think a man's condition can properly be determined by his appearance only. I reserved my arguments on the subject founded on the diminution of the population till reporting on paragraph 25 of Chapter I. I have also yet to remark on another point connected with statistics, viz., the great increase of persons receiving gratuitous relief as the famine advanced in proportion to those on works.

Before, however, coming to these points of the subject, I would wish to amplify what I have said about the danger of reducing a man's daily allowance of food, by stating what I understood to be the quantity of food usually consumed by the cultivators at Belgaum.

Daily Quantity consumed by the well-to-do Classes.

Morning meal.

2 breads of jowari, weighing 1 lb.
2 oz. dal.
4 oz. rice.
2 oz. vegetables.
½ oz. condiments.

Evening meal.

8 oz. jowari.
2 oz. dal.
4 oz. rice.
2 oz. vegetables.
½ oz. condiments, salt, &c.

Daily Quantity consumed by lower Classes of Cultivator.

Morning meal.

2 breads, weighing 1 lb.
2 oz. dal.
½ oz. condiments, salt, &c.
Ambil (a kind of gruel made from ragi).

Evening meal.

Same quantity.

Firewood is not alluded to above. The famine rations therefore were a considerable reduction even for the lower classes of cultivators, to say nothing of those who were better off, especially when nothing was allowed for Sunday.

I will now make remarks in regard to the diminution of the population. The following statement shows approximately what this diminution has been:—

Talukas.	Population according to Census of 1872.	On 31st July 1876.	On 31st July 1877.	Difference between columns 1 and 3.
				Less.
Belgaum - -	1,34,621	1,32,422	1,29,291	3,131
Bidi - - -	78,875	80,078	78,006	2,072
Chikori - - -	2,48,685	2,42,422	2,34,175	8,247
Sampgaon - - -	1,31,504	1,31,879	1,25,804	6,675
Parasgad - - -	1,20,691	1,16,658	97,362	19,296
Gokak - - -	1,09,697	1,10,796	94,137	16,659
Athni - - -	1,14,677	1,13,797	99,554	14,243
	9,38,750	9,28,052	8,58,329	69,723

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* I must note here that though works under Civil agency were discontinued in this district at an early period of the famine, payment at Civil agency rates was still given by the Public Works Department to labourers on works being carried on under their supervision who under Government orders were not entitled to the higher rate.

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The figures for five talukas out of seven are for 31st July 1877, or before the famine had reached its height. It shows therefore a death rate of only about 7 per cent. on the figures for 1876. As the great mortality did not occur till August and September, I think that it may fairly be presumed that 9 per cent. of the population succumbed to the famine. In Sampgaon, which suffered less from the famine than any other taluka, the figures for 1872 and January 1878 show a loss of nearly 5 per cent., while in Athni, which was the most severely afflicted of all, the same figures show a loss of nearly $12\frac{1}{2}$ per cent. I think this is a large mortality. The question is if it was unavoidable,—in other words, if by somewhat more liberal expenditure in some branch of the famine relief arrangements it might not have been lessened. I am aware that in a Government Resolution on the famine census it has been suggested that a part of the loss of population may be due to emigration; but knowing the attachment people of the cultivating classes have to their homes, I fear that if we had the means for ascertaining the real facts we should find the loss owing to emigration to be very small indeed. The census of 1881 ought to throw some light on this subject.

I will now go on to the consideration of the weekly summaries published by Government in connection with this subject.

The following figures are taken from these summaries:—

Statement Week ending	Population of Belgaum District.	Affected of Belgaum District.	No. of People on Works.	Average No. of Persons gratuitously relieved.
26th January 1877 - -	9,38,750	5,01,000	29,049	345
23rd February „ - -	—	—	18,000	508
30th March „ - -	—	—	25,000	685
27th April „ - -	—	—	29,000	2,253
25th May „ - -	—	—	45,000	6,782
28th June „ - -	—	—	25,249	8,153
26th July „ - -	—	—	22,097	6,070
30th August „ - -	—	—	26,059	5,832
29th September „ - -	—	—	22,444	*10,645
27th October „ - -	—	—	6,580	13,184
24th November „ - -	—	—	696	3,631
22nd December „ -	—	—	—	56

* Collector's return incomplete.

It will be seen that at the beginning of the famine the people, while not very ready to ask for gratuitous relief, flocked to the works. It is probable that in some of the first returns persons fed in relief houses or private charity were not included; but private charity became exhausted about the month of May. It would have been expected, however, that after that the ratio of persons employed on relief works and those receiving gratuitous Government relief would have remained about the same, but it will be observed how greatly in the latter days of the famine, the ratio of persons on gratuitous relief increased in proportion to to that of those on the works. Where, I would ask, did the extra number come from? I fear the conclusion is but too obvious, that many of them were persons who had originally been on the works, and who, whether from unwillingness to work on the ration allowed or on the insufficiency of the ration, had afterwards become so reduced as to require gratuitous relief. It is fair to state that the numbers on gratuitous relief were much increased in the taluka of Athni after the visit of the Sanitary Commissioner Dr. Hewlett, on whose recommendation it was thought right to make provision for many children who appeared to be neglected by their parents. But I would observe that it appears to me to be more than probable that these special measures on behalf of these children would not have been required to the same extent had the wages on relief works been somewhat more liberal.

A note of the allowance given in the Municipal relief-house at Belgaum from June or July to October may not be considered out of place.

Men on works.

5 breads weighing 2 lbs., dal 4 oz., 2 lbs. of ambil, $\frac{1}{2}$ lb. jowari.

Women on works.

4 breads weighing 1 lb. 10 oz., dal 4 oz., ambil $\frac{1}{2}$ lb.

Men unable to work.

3 breads weighing 1 lb. 3 oz., dal 4 oz., ambil $\frac{1}{2}$ lb.

Women unable to work.

$2\frac{1}{2}$ breads weighing 1 lb., dal 4 oz., ambil $\frac{1}{2}$ lb.

Nursing mothers.

5 breads weighing 2 lbs., dal 4 oz., ambil $\frac{1}{2}$ lb.

Children under 10.

$1\frac{1}{2}$ bread weighing $9\frac{1}{2}$ oz., 2 oz. dal, and $\frac{1}{4}$ lb. ambil.

I believe that though the average number of persons provided for daily at one time exceeded 300, yet during the four months or so this relief-house existed, from about the beginning of July to the end of October, only two deaths occurred, both of children, one of which died soon after its birth. I will conclude my remarks with a few general observations. The famine, as far as it affected the people, did not reach its intensity till August and September. Considering the number of deaths that occurred and the fact that the famine may have been considered almost over by the end of October, the question naturally arises, what the mortality would have been if the famine had lasted another year. My own impression is that if some considerable relaxation of the rules regarding labourers had not been ordered, nearly all the labouring population would have died. By my use of the words "utterly inadequate," in my letter No. 2488 of the 19th September, it may be inferred that I think that the wage should have been very much increased. I think that it might with great advantage have been increased by one-half. This would have involved a considerable increase of expenditure, but one, I think, incommensurate with the relief which it would have afforded. I believe also that in the long run Government would not have lost as much by such increase as might at first sight appear, as I think it may be fairly affirmed that with an increased ration more work would have been obtained from the recipients of it. It would also have tended to keep in check the increase on gratuitous relief. It is, too, quite possible that the effect on the collection of the Government land revenue might have been favourable.

I may be allowed to observe that personal experience must have considerable weight in influencing the judgment. I think that any person who tries to modify his diet to any great extent, either by the reduction of quantity or by alteration of quality, will find himself a sufferer. Let any man who has hitherto made animal food a portion of his diet, give it up altogether, he will soon find it necessary to take to it again. I have made experiments in my own case in regard to diet, and I am afraid with some disadvantage. If anyone, therefore, after reading my remarks should feel a difficulty in concurring with my conclusions, let him personally try the effect of reducing his diet by exactly one-half, not more, and of persevering in this course for six months or a year, and I am assured he will find that his views become very considerably modified. I may be allowed to take this opportunity, the last I perhaps shall ever have, of stating my regret that it should never have occurred to me during the course of the famine to suggest that, after the practice usual in jails, the relief labourers should have been occasionally weighed. This would have given a very correct idea of their physical condition from time to time, except in cases where they had other means of relief, as from charity of Saukars and others. Whatever conclusion the Committee may form from the facts I have stated in support of the opinions I have formed, the question of the diet required for relief labourers should, on the occurrence of another famine, be soon set at rest by this practical mode of testing it.

Lieut. de Villamil.—The wage for a man should be, in my opinion, the price of 2 lbs. of the grain procurable locally, paid six days a week, and at the price ruling in the nearest large village within a radius of three or four miles, not the rate at the head-quarters town as is generally paid. Coolies cannot go to the head-quarters to procure food.

The 1 lb. of grain + one anna is an irrational and unequal way of paying; no cooly pays 6 annas per week for condiments, nor can he live on 6 lbs. of grain per week when he is doing work.

Let me give an example of the unfairness:—In Sholapore, in February 1877, grain was selling at six or seven pies per pound, and consequently a man was paid the price of 17 or 18 lbs. per week (at 1 lb. + 1 anna per day for six days of the week). In Kaladgi (Badami taluka), in July 1877, grain was selling at 2 annas per pound, so a man was being paid the price of 9 lbs. of grain per week only. Either the former was too much (*i.e.*, more than absolutely necessary) or the latter was too little; the latter was *less than the scale of food in the relief houses* and was subsequently increased by one-sixth for Sundays.

As I was one of the officers mainly instrumental in getting the increase, I must confess that the 10½ lbs. per week was *enough*, but I think it was "sailing a little too close to the wind" to be safe. I would prefer 12 lbs. per week for the wage; this would give 1½ lbs. of grain for seven days a week, and a small margin for condiments. The scale should therefore be:—

Man, price of 2 lbs. grain.
Woman, „ 1½ „ „
Child, „ 1 „ „
Infant (fed), „ 10 ozs. „

The infant to be fed up to the value of 10 ozs. of grain for seven days per week.

This amount of pay, if given *regularly every three days* will be found quite ample for supporting life and enabling a cooly to do a fair day's work, but it is of the *utmost importance* that payments should be *regular* and *frequent*, or no reliance can be placed on *any* rates of pay, which are reasonable, being sufficient.

I have seen coolies keep in good health and improve on 10½ lbs. of grain per week when it was paid regularly every three days, and I have seen the same people reduced in physique when the payments were *weekly and one week in arrears*; in the latter case it is possible the people had a certain per-centage mulcted, but I cannot say for certain.

The Rev. C. Harding.—I don't think the wages should have been so low as they were, both the Civil Agency and the Public Works Department rates. I formed this opinion from seeing the condition of people after they came off the works, not while on them. Natives told me that when they went to Public Works Department relief works (not Civil Agency works) they had to wait till pay day came round, so had to borrow and continued in debt all the time they were there. They often had to buy fuel and to pay something for use of a mill to grind. If their work fell short, they were cut accordingly, and were often fined in consequence of temporary absence through sickness. The plan was to pay every week, but this takes a deal of time, and sometimes, especially in Kaladgi, they went two weeks and even three without being paid. I heard this asserted by many people, but not till after I had been to the district and the works had been closed. I thought the bulk of the people on the works were at the end of their resources, and must die if not supported by the State. In Kaladgi when I visited the villages I was frequently told that people had died on the relief works or had gone to the poor-house and died. In Sholapur during 1877 many of the villages were almost deserted. I have seen a village of 100 houses with only five houses inhabited. Those who remained were the richer people.

I don't feel competent to say what the relief wage should be. In a village dole I think 1½ lbs. for a man and 1 lb. for a woman enough. I asked a man and two women who had left the Ashti tank how much they had received and what grain they could purchase during the last week on the work; it amounted to 1½ lbs. apiece.

Mr. Candy.—I was in civil charge of the relief work on the Dhond-Manmar Railway. From February 1877 I watched the condition of the people, heard their complaints, and brought what was necessary to the notice of Mr. Izat, Chief Engineer. When I first went to Dhond in February, I found about 500 people who had heard the railway was to commence; they were in good condition and came from the neighbouring parts of Nagar and Poona districts. Many had left a road under ordinary Public Works Department supervision to come to the railway, thinking the rates would be better. Most of these were professional labourers, who usually get employment under the Public Works Department. I formed them into gangs and took a list of their names. Other people, including many cultivators, soon began to come; and then I got the order that no one was to work within ten miles of his home; so I sent them on to the gang next beyond, about 25 miles off. Soon after another party was opened between those two points; so that about the middle of March there were three parties at work on 25 miles of railway. There was an engineer with a staff of subordinates over each camp. We got the people hutted as soon as possible, mostly under a blanket stretched on sticks; we also got Marwaris to open grain shops at the camps, and there was some difficulty about this; once the chief shopkeeper at the camp on the Bhima died of cholera, and all the rest bolted and had to be encouraged to come back. Other people began soon to straggle on to the work in a quite exhausted state, and for these I opened a relief kitchen on the banks of the Bhima in March. It was an open place; the people were fed morning and evening, and the engineer sent to it all who were too weak to work. Similar relief kitchens were opened in connection with the other two parties. New-comers also who came on weak and exhausted were fed here before they were sent to work. On the 25th March Sir R. Temple came and inspected the gang, about 2,000, on both sides of the Bhima, and picked out the weakly; up to this time the railway engineer officers were receiving all and treating them all as able-bodied; they had no weaker class of workmen, but sent to me the halt, blind, &c., who were unable to do any work. At this time, and in consequence as I think of the heavy task and the absence of any distinction between those who were able-bodied and those who had ceased to be so, a kind of choleraic diarrhœa broke out, of which many died. Mr. H. Vacher, the executive engineer at Dhond, then gave advances all round to enable the people to buy grain. This stopped the diarrhœa, which was due I think to their not having enough to eat. The people had been cut down to a rate below the prescribed wage, because the gangs comprising a number of people not able-bodied could not do a full task. Wages at this time were paid weekly on Sundays for six days. Very little firewood could be got for the picking up, and it was very expensive; so they bought parched gram instead of their usual food. There was little or no sickness at Dhond during April and May. Once about the 18th of May violent rain fell. I heard many of the people were in distress, so I issued gratis, as an extraordinary measure, large quantities of grain. The people remained well and quiet.

In my opinion the people worked well and quickly up to June. The causes were: many supplemented the Government wage by private supplies of grain got from their villages; they also sold to the grain merchants their ornaments, utensils, millstones, and even the Government tools. When these means failed, the condition of the people deteriorated.

The reluctance of the people to work also arose partly from want of spirit and hope, especially when the rains threatened to fail. In July and August piece-work was introduced—the people formed their own parties, worked when they liked, and were paid oftener. Before the people were often paid only after a fortnight, and had to borrow from the Bania, who was repaid with interest when pay day came. Also the wage was fixed with reference to prices at Nagar, while grain could not be got at that price on the works. I think that once the difference was so great that prices were 24 lbs. at Nagar, and 12 lbs. at Loni. In that case I laid in a store of grain at Loni and threatened to open it, if they did not charge a fair price, and they gave in and I never had to sell it. My experience is in favour of piece-work for able-bodied people. Under task work with muster rolls there was much fraud; false names were often entered. In a gang of fifty some four or five would be dummies. The work was short, and all were cut in consequence, the mustering clerk drawing the pay of the dummies; also the real labourers had to pay a douceur to the clerk. Piece-work requires that people should know each other, and would not be done by people brought together from anywhere, unconnected with each other; it would not be safe unless there were a task work gang to fall back on for the weak labourers, a relief kitchen for incapables, and a hospital for the sick. If the work is given to large contractors, there is no security that the people will be paid at all, and I would not have them on any consideration.

Mr. Fforde.—At first I had charge of the general famine relief measures in four western talukas, and continued in charge nearly to the middle of the rains. I had under me a number of road works. My experience of the Civil Agency wage, 1 lb. + ½ anna, was that it is sufficient for a man who begins in fairly good condition, and on it he can perform 50 per cent. of an ordinary task. If he comes to work in bad condition he must have more food, and must be specially treated, or he will not pick up. People who came on in good condition throve on it; some able-bodied came and offered to work at a less wage, 9 pie, rather than the full wage on the Public Works. They belonged to a village close by, and the Public Works Department work was about 12 miles off: my instructions were to send all able-bodied people to Public Works and not to receive them on Civil Agency works. I met them afterwards on their way to the Public Works, and I afterwards heard they went to look at it, and refused to work there when they found a full task was exacted. The general result of turning people off the Civil Agency work was that they went and lived at home. On the Civil Agency works at Rahuri there were people who had silver ornaments on, and whose children had silver ornaments, and who lived in the villages close by: they were turned off, but refused to go to Public Works. Towards the end of the famine people turned off Civil Agency works would go to Public Works Department works because they were pinched. There were a great many on the works who were not in need, and who would not have come but for knowing that they would not be heavily tasked. When we were absent the overseers took on persons in good condition; when we visited the works we turned them off and told them to go to Public Works. I think there should be no Civil Agency works at all; all works should be under Public Works Department, but there should be a Civil relief officer to superintend the relief part of it. The amount of work done on Civil Agency works was only 15 to 20 per cent. of a full task. We had only one class of labourer. Those able to move about, but who could do no work, were sent to the relief kitchens, where they got 1 lb. of cooked food; this was quite enough.

I had a set of children at Indapur after the famine on whom I tried experiments of food.

I gave 5⅓ ounces bread and 4 ounces porridge; that is, 1 ounce of dal, in three meals, to children from 7 to 12; 9 ounces porridge and 1 of dal to children from 4 to 6. In both cases the children increased 4 lbs. per head in a week; but they went down again afterwards when kept on this food without change. The above is the weight of the uncooked flour of which the chupattis, porridge, and dal were composed.

If the Civil Agency works people were put under the Public Works Department, and worked as hard as was good for them, I think they should get the full rate paid on Public Works Department works. It would be as economical to feed these people at home, considering what the value of the work they do is; but then there would be a great rush on this kind of relief.

I think the responsibility of taking care of the infirm should be more thrown on the patel than has been done.

The general complaint of all on the works, strong and weak alike, was insufficiency of the wage. Towards August 1877 I thought the people were getting weaker and thinner on the railway works. As a rule they did not complain till they were asked. As the works went on, people who were completely destitute would often go home for a time and then return to work, often returning to Civil Agency works for a time, and then being sent to Public Works.

Another source of loss was the exchange on copper, the glut of which was such that 17½ annas in copper were worth 1 rupee, and the small purchasers lost proportionately on each transaction; also, in every bazaar there were false weights and measures. I caught several of these and got the owners punished. The people had to pay bribes to the mokaddam and the karkun, &c. I don't think many of the actual land-holding khatadars came on the works, though some members of the family did; they got advances from the Bunnias and had property of their own.

The Rev. S. B. Fairbank.—The people dislike to go to Public Works now more than in the famine, because it is all contract work now, and the contractors are harder upon them. They only go to contract work as a last resource. The people we sent to the railway in the last half of 1877 frequently came back exhausted in a few weeks, and had to be put in our relief camps. The people came from villages round, and we sent them to the Public Works. We made three classes. One, the strong, we sent to the railway, another to the municipal works near the city. There were 800 or 900 there; they got bread or grain, and had to work; 22 ounces of bread and a little vegetable and condiments. Those in the city afterwards got 14 ounces and did no work. They were too utterly impotent. A third class were fed. More than 100 died in our relief camp. What the people got on the railway was enough if they had got paid daily, but they got it once in three days, or once in six, and this put them into the Sahukar's book. They did get paid once a week; much pains were taken to do this by the gentlemen in charge.

The work was contract work, 100 cubic feet for 4 annas. A man and his wife in good condition can do this in a day. But these people could not do it, and did not. They left the work and came away to the relief camp ready to die. Some certainly were lazy, but we kept a sharp look-out for malingerers.

The difficulty was to make the people who supervised the labourers honest. In the worst of the distress the karkuns and maistries would make something out of the people.

More money was wasted on small works than on large. With a view to the interest of the people the railroad works would be better than small tanks.

Mr. Clerke.—I had no opportunity of ascertaining what the people actually bought with their wages. But I know that some were found to have accumulated a few rupees, and the shops opened on the works sold not mere necessaries, but also luxuries, such as sugar, tobacco, &c., and even glass beads and bangles. I did not come across cases of people who were forced to sell their pots and clothes in order to live, the wage not being sufficient. In some cases working people had old and feeble relations living with them in their huts. We used to give them charitable relief ourselves, but for the most part such people went to the relief-houses kept by civil officers at the taluka towns. On two occasions I mustered all the people on my works, the Mutha Canal and the Matoba, Patas, and Sirsophal tanks, and counted the number of ryots. Out of 26,000 working people, men, women, and children, in March 1877, 16,700 said they were cultivating ryots; to some extent their statements were tested by the patels who were present. Towards the end of April again, out of 31,600 people 20,092 were cultivating ryots. Mr. Joyner, who was on the Mutha Canal under me, and had about half of the labourers, was satisfied that their statement was true. He speaks the language well and knows a great deal of the people, and is not likely to have been much deceived. These figures were reported by me officially to the Famine Department, and similar returns were sent in by all the famine works, I believe, in all districts. In the same return was shown the districts where the people came from, and there were not many wanderers on my works from distant districts.

Mr. Wingate.—When dealing with thousands it is no test of a wage to find here and there somebody weak and ill. At first I made many inquiries, and I satisfied myself there were reasons why these cases should occur; after that I simply set aside the exception for exceptional treatment; but to the last I could turn out the Department Public Works gangs and feel they were as strong and cheery-looking as in a time of great trouble one would expect to find the population. Whatever a wage may be in theory, in practice I know that I can support hundreds of thousands on the value of a pound *plus* an anna; that a large majority will save on that wage; and that with graduated tasks, proper hospital arrangements, and a nursery for the children of those parents who are selfish or careless, I should fear the results of no inspection. I say so after handling, questioning, and examining very anxiously large numbers, and the same people over and over again, during some five or six months of the worst of the famine in the worst part of our worst district. I go further and say, what I thought during the famine, that I could turn the whole Department Public Works people over to a Civil Agency wage, and pick out for the Department Public Works wage the few thousands who would require it; but I would not perhaps recommend this, unless I had a very strong staff of village relief officers. But I think the wage might with advantage have been reduced in the less affected tracts, and this would have covered any liberal increase thought advisable in severely distressed quarters during the rains, when grain was very scarce. But whether the wage could have been here and there judiciously reduced or not, it was not the people on the works who gave trouble and anxiety, but the people off the works. Once I had got people to the works, and secured their staying there, my experience was that I might cease to be anxious on their account. But anybody who knows anything about real famine would not expect a mere money wage to be sufficient in every case, and would not be surprised or abuse the wage, because he had to look after the children, and growing boys, and sick cases, and bazaars, and frequent payments, and make advances to a large family, and so on. An economical wage is only to be made a safe wage by such watchfulness. I thought the concession of the Sunday wage to the Department Public Works labourers unnecessary, and I care nothing for calculations so long as the gangs maintained their physique; for the Civil Agency people it was necessary, no doubt, but as I could put all my weakly people on Department Public Works wage with no tasks, and specially care for them, practically the concession was not even in their case required. The mortality was due to causes apart from the wage given; people were marked for death before Government dealt with them.

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Madras

Mr. Longley.—It has been assumed by some, though in my opinion (confirmed by experience) fallaciously, that the price of 1 lb. of grain is sufficient to maintain an adult laborer in health, allowing a few pies for condiments, and the following scale was allowed in G.O., No. 329, dated 31st January 1877:—

(1.) On works on which taskwork not less than 25 per cent. below ordinary task is enforced—

For a man the value of 1 lb. of grain + 1 anna for condiments.
„ woman „ 1 lb. „ + $\frac{1}{2}$ „
„ boy or girl „ $\frac{1}{3}$ lb. „ + $\frac{1}{2}$ „

(2.) On works on which taskwork not less than 50 per cent. below ordinary taskwork is enforced—

For a man the value of 1 lb. of grain + $\frac{1}{2}$ anna for condiments.
„ woman „ 1 lb. „ + $\frac{1}{4}$ „
„ boy or girl „ $\frac{1}{2}$ lb. „ + $\frac{1}{4}$ „

The effect of the above wages was carefully watched, and in G.O., No. 1088, dated 15th March 1877, it was deemed insufficient to maintain the people in condition. Accordingly a relaxation was allowed in the case of persons whose appearance indicated physical deterioration. In G.O., No. 1788, dated 22nd May 1877, the wages in both the above classes of works were assimilated. In G.O., dated 24th September 1877, No. 2847, the following scale was adopted:—

(1.) Upon Professional Agency works (corresponding with Class I. of G.O., dated 31st January 1877)—

For a man the value of 1 lb. of grain + 1 anna 6 pies.
„ woman „ 1 lb. „ + 1 anna.
„ child of seven years and upwards the value of $\frac{1}{2}$ lb. + 9 pies.

(2.) Upon Civil Agency works (corresponding with Class II. of G.O., dated 31st January 1877)—

For a man the value of 1 lb. of grain + 1 anna.
„ woman „ 1 lb. „ + 9 pies.
„ child „ $\frac{1}{2}$ lb. „ + 6 pies.

The wages sanctioned in G.O., dated 31st January 1877, were being paid on Sundays, though no work was exacted on those days; but, as the scale prescribed in G.O., dated 24th September, included the pay for Sundays also, no payment has since been made on those days. Assuming the price of 1 lb. of grain to be 1 anna, the following statement compares this scale

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as distributed on all the seven days of the week with that sanctioned in G.O., dated 31st January 1877—

Description.	G.O., No. 2847, 24th Sept. 1877. A.	P.	G.O., No. 329. 31st Jan. 1877. A.	P.
Class I, Works—				
For a man - -	2	$1\frac{5}{7}$	2	0
„ woman - -	1	$8\frac{4}{7}$	1	6
„ child - -	1	$0\frac{6}{7}$	1	0
Class II, Works—				
For a man - -	1	$8\frac{4}{7}$	1	6
„ woman - -	1	6	1	3
„ child - -	0	$10\frac{2}{7}$	0	9

Early in 1877 I visited the relief laborers, some 3,000, engaged in dismantling the fort walls at Dharmapuri. The work was comparatively light and adapted for women and children. It was prosecuted on the daily wage system. The rates of wage averaged—

For men - -	2 annas.
„ women - -	1 anna and 6 pies.
„ children - -	1 anna.

Wage was given on Sundays, but work not demanded; the non-working children of *employés* were fed at kitchens on the work. The average price of rice was 1 anna and 2 pies per lb.; deducting 3 pies and 2 pies respectively for condiments from adult and children's wages, men could procure $1\frac{1}{2}$ lb., women 1lb. and 1 oz., and children 11 oz. of grain. On this wage the men were in best condition, but the women and children were all below par. A number of these gangs were inspected by Dr. Macdonald (Bengal Medical Establishment), doing duty as sanitary officer in the Salem District, and he wrote thus on the 9th May 1877:—

"The women, lads, and girls were under-fed. Even those who received some aid from friends were in bad condition."

The labourers purchased with their wage the best food procurable, and as much of it as they could get for their money; the very confirmed betel and tobacco consumers sacrificed a modicum of food to gratify what to them was almost a necessity in the shape of the betel or tobacco.

The cheaper kind of food is taken as the standard; once in every fortnight tahsildars ascertain the ruling price in the bazaars of their head-quarters and communicate the same to the Public Works Department officers.

The wages should be regulated as follows:—

For 25 per cent. of the ordinary outturn—

	Food-grain. oz.		Money-payment for condiments. pies.
For a man - -	20	+	8
„ woman - -	20	+	8
„ child - -	12	+	3
For 50 per cent. of the ordinary outturn—			
For a man -	24	+	8
„ woman -	24	+	8
„ child -	16	+	3
For 75 per cent. of the ordinary outturn—			
For a man -	30	+	8
„ woman -	24	+	8
„ child -	16	+	4

I believe, if these rates are curtailed, the physical condition of laborers will sensibly deteriorate.

Mr. Price.—Many years before the famine occurred I had given some attention to the habits of the laboring classes in the adjacent district of North Arcot and in a taluk (Wallajah) bordering on this district. I made inquiries of many persons regarding the quantity of food eaten by the working classes. I then learned that the regular allowance which a really hard-working and healthy male adult cooly could dispose of in a day was one local measure of *raw* rice (120 tolahs) = 3 lbs. In Salem pretty nearly the same calculation was made, the "mânam" there being, as well as I can remember, just about half a Madras measure. The quantity was two mânams of rice per diem and a little less in the case of dry grain. The quantity mentioned may look rather large, but it is to be remembered that the man gets nothing with his rice or dry grain excepting a little pepper-water and salt, or a chutney made of tamarind, a brinjal or two, and pepper.

The regular wage in harvest time, when men have to work hard, is 2 annas and a measure of grain, or else 2 annas and one or two meals, according to the master's power of bargaining. People who are not so heavily worked of course do not eat the quantity mentioned. In Bellary, where I was a divisional officer, at the commencement of the famine we gave, I believe, a Bellary measure, which to the best of my recollection is $2\frac{1}{4}$ lbs. to a male adult, half a measure to a female and child over twelve, and quarter for each child. I think, too, that there was a money payment also of 6, 4, and 2 pies for condiments, but cannot be sure. When the one-pound ration was introduced prices had risen and the six-pie allowance was probably not more than enough. I have seen the effect of the payment of the price of one pound of grain and 6 pies on a very large number of laborers. My experience is that they slowly but steadily declined in condition, that the slightest scratch produced ulceration, and that if taken ill it was a serious matter with them. When we paid in the price of a pound of rice and the people could procure dry grains at a cheaper rate, they managed to get on, but where the rule was strictly enforced, and the price of the cheapest grain ordinarily consumed by the laboring classes was paid, the effect was marked and unfavorable.

I am altogether opposed to a wage test, but if it is desired to employ it, there are two modes by which to fix it.

1*st.*—To definitely settle, as it is to be presumed that medical men can, what is the quantity of food which will enable an adult male and female and a child not only to *exist* but *to do a fair day's work.* The other mode would be to dispense with doctors' opinions altogether, to assume that a full grown cooly, as is pretty nearly the case, spends three-fourths of his daily earnings, where such earnings are entirely in money, upon food, to ascertain what amount of the kind used by the laboring classes is purchaseable with these three-fourths in an ordinary season, and to base the famine wage upon this. The principle is in either case the same, the difference being that results are in one case arrived at by scientific and in the other by unscientific means. I do not consider it safe to attempt any other principle. It is, in my humble opinion, which is formed upon some experience, a false economy to give on relief works a wage calculated only to support life.

Mr. Weekes.—It has been assumed during the Madras Famine—

(1) that the price of 1 lb. grain + 1 anna was sufficient for a man, the same less 6 pies for a woman, and the value of $\frac{1}{2}$ lb. + 6 pies for a child, if the task were 50 per cent. of ordinary rates;

(2) that the above rate should be reduced 6 pies for men and 3 pies for women and children; and,

(3) that the first rate was sufficient for those doing 50 per cent. of an ordinary day's work, and that for those doing 75 per cent. of an ordinary day's work the money addition for a man should be increased to $1\frac{1}{2}$ annas, for a woman to 1 anna, and for a child to 6 pies.

My impression is that for famine and mere subsistence allowance rates Nos. I and III are somewhat excessive in the condiments allowance.

I cannot believe it is necessary to eat so much of chillies, tamarind, ghee, curry-powder, onions, garlic, meat, besides dholl and vegetables, as are recommended as necessary for people in relief-camps even (*vide* G.O., No. 1648, of 5th May), and I conclude the medical officers would recommend more as necessary for working laborers. Some laborers that, to my knowledge, did *over ordinary* * rates of work on rate No. II did certainly, some of them I say, look too thin; but they were, I think, rather over-worked and this told on the weaker of them; but I should hesitate to say rate No. II was evidently insufficient. To my mind the unwillingness of the people to go to Nellore was responsible for much of the low condition of some of the people in May.

At about the worst time of the famine in Cuddapah, say the 14th July, ragi was selling at 7·59 seers per rupee (and cholum the same in the preceding week). At this rate six pies would buy almost ½ lb. of ragi, and I should think if a man were starving on 1 lb. grain, he would prefer an additional ½ lb. of the food he is accustomed to, to half anna worth of condiments. And I should say if he spends the six pies on condiments, then the 1 lb. grain is not insufficient. If he does not spend it on condiments he gets more than a lb. of grain.

I consider the wage test must depend on the physique, antecedents and habits of the people concerned.

I would consult and compare the normal rates for labor in different parts of India; and reduce the normal rates of daily wages slightly, not much, for anything under full work, and give almost ordinary rates for labor on great works. But by normal rates I am far from meaning what the Department of Public Works give. I mean what the ordinary employers of labor give. Natives, as a rule, are paid according to their work, and they ordinarily work *comparatively few hours a day, and not every day in the week.* I consider it to be *against their nature for men, women, and children to work six days in every week for nine hours a day for many consecutive months.*

Mr. Oldham.—(1.) The Wage Test.—The best answer to these questions will be by the following description of an experiment:—

(2.) In Adoni in July last, I formed a gang of 300 adults of whom 180 were women. Nearly all the members of the gang were in fair condition, and none were in an emaciated state, though the condition of some was considerably below par. A special subordinate was deputed to pay and to supervise the gang. It worked under my own eye, and each member of it was instructed to bring any grievance at once personally to my notice.

(3.) The pay of each laborer in the gang was the exact buying price of one pound of cholum of the cheapest sort, *plus* one half anna. They were paid daily in the morning, on Saturday getting the wage for both Friday and Saturday, and on Monday getting paid for Sunday; but they did not work on Sunday.

(4.) The gang consisted of people of the ordinary agricultural and laboring class, and included a few Mussulmans and a few out-castes.

(5.) They came from different places, but at the time of the gang's formation, they were all living or lodging in Adoni. They began to work about two miles from there, and were employed in digging side channels and strengthening them with single blocks of stone or revetment work, and in patch repairs on a stony road. They worked by task, the task exacted being about 50 per cent. of an ordinary day's work at the Public Works Department rate, and short work or misconduct in the gang was punished by fine from the daily wage.

(6.) When their work had carried them to the 6th mile from Adoni they hutted themselves without any assistance from me among the rocks by the roadside, and continued their work on to the 10th mile, when at the end of October, they were made over to the Public Works Department. At that time their numbers had sunk to 210, but still included all the poorest members of the gang. The rest had left for the harvest then in progress, or for their homes. At the time that they were handed over, each member of the gang was in excellent condition.

(7.) The deduction is that a relief-laborer can not only keep in good condition, but can improve in condition, can give a fair outturn of work, and can also stand a distance test, on the wage which these people got, provided always that it is ensured that he gets this wage regularly and all to himself, and that the amount of grain, to buy which its rate is fixed, is procurable within his reach. In fixing the rate at this scale for large bodies of people scattered over extensive works and at great distances, both these considerations are apt to vary much; and if the former be secured, it is sometimes impossible to ensure the latter being so also.

(8.) The price of the standard kinds of food on which the wage is based is to be ascertained at the nearest market from the dealers themselves; the results of the reports on the subject being checked by the officers in person. I have not found that information on this point was defective or erroneous.

(*a.*) I would formulate the conditions of a wage test on the experience above described, enjoining particular care in adopting a sliding scale of wages to the rates at the nearest markets. In Adoni these markets were on or close to, and in many cases created by the works themselves.

Major Ross.—I think the scale laid down in the G.O., Madras Government, of the 24th September 1877, is as nearly correct as any scale could be.

I have found that emaciated persons coming into camps before all hope of their recovery was gone, by reason of impairment of the digestive organs, regained strength and flesh on the camp ration of 20 oz. of grain and condiments. I consider that the cooly receiving the Civil Agency rate of value of 1 lb. of grain and 1 anna—total 2 annas—would be in about the same position; as a rule, they do not purchase fire-wood, but pick up small sticks during the day while they are at work.

The laborers on the professional works decidedly improved physically on the wage of 2 annas and 6 pies. That sum would purchase *in the height of the famine* 1 lb. and 11 oz. of rice.

Major Ross Thompson.—The wage should vary with the amount of work turned out—should in fact be the value of the *piece* executed.

The value of the piece should again depend on the value of grain. The rate given per piece being such that it would enable a laborer to procure as much plain food as would keep him in health and leave a margin over to enable him to provide for infants, sick, or cripples of his family, and thus avoid the inevitable demoralisation consequent upon giving gratuitous relief. By working on the piece-work system a whole family may take their share in the work, the old and young, the strong and weak. Payments are immensely simplified, and the harder the people work the more do they benefit themselves.

Mr. Nordmann.—*The wage test.*—I consider the ("Professional Agency") wages hitherto paid, viz.,—

For a man—1 lb. of grain and 1 anna 6 pies,
For a woman—1 lb. of grain and 1 anna,
For a child—½ lb. of grain and 9 pies,

just sufficient; I have noticed people improve in condition on these wages, within a couple of months.

On the other hand, the (lower) "Civil Agency" wages, given to people who require strengthening before they can work much, viz.,—

For a man—1 lb. of grain and 1 anna,
For a woman—1 lb. of grain and 9 pies,
For a child—½ lb. of grain and 6 pies,

has been barely sufficient to keep body and soul together; and the improvement in these people's condition at this rate of payment has been, if it took place at all, scarcely perceptible. The prices of the staple kinds of food are ascertained monthly from taluk tahsildars.

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* The work was done below the Department of Public Works estimate, which was made on inspection and examination of the work done.

To remedy the insufficiency of the "Civil Agency" wage, and yet not encourage people to remain in that category, but induce them to endeavour to work hard so as to be promoted to the "Professional Agency" rate, it would perhaps be advisable to raise the grain part of both rates by say twenty per cent. But in that case, tasks ought to be more rigidly enforced than is frequently the case at present among the "Professional Agency" gangs; and no people to be admitted to these gangs except they can and will do the full task.

Mr. Rundall.—I have no data to test the accuracy or error as to the assumption made as to the quantity of food required. The people now on relief works on Civil Agency rates do not expend all their earnings, but hoard some or give to relatives who come and collect it; such people continue in low physical condition. The price of food is ascertained by the rate at which grain is sold at the weekly market at the cusbah of the taluk in which the work is situated.

Captain Maitland.—The wage test—

	Rice.	
Man - -	1½ lb.	+ nine pies to one anna for condiments,
Woman - -	1 lb.	
Boy above seven	1 lb.	

seems a fair wage for Madras for a full day's task, but I would always adopt piece-work for able-bodied paupers; it was most successfully carried out in this district, the rate depending on soil, work, &c. In Madras one anna per excavation, three pies for twenty yards lead, and two pies per yard lift for every cubic yard was given. The price of grain was ascertained weekly through the civil authorities.

Sergeant Stewart.—*The wage test.*—I beg to submit that this also is unsuitable, and only tends to increase the gratuitous relief of old people and children, sick and cripples; the great majority of whom would be more cheaply and better supported by the working members of their families, if these working members were themselves in receipt of proper wages, that is, the normal wages *plus* some addition as compensation for dearness of provisions. I found it so on the Kalahasti-Maderpauk new road.

Surgeon Gray.—The coolies employed on the Gooty road near Peapali, Kurnool District, were paid according to the following scale:—

CIVIL AGENCY WORKS.

	A.	P.	
Man - - -	1	9	At the period this enabled a man and woman to buy respectively three-quarters and five-eighths of a seer of rice, *i.e.*, 24 and 20 oz. The price of rice was one anna and six pies per three quarters of a seer, or two annas per seer.
Woman - - -	1	6	
Child above 7 years	1	0	
Child under "	0	5	

PROFESSIONAL WORK.

	A.	P.	
Man - - -	2	3	At this period this enabled a man and a woman to buy respectively one seer and three-quarters of a seer.
Woman - -	1	9	
Child above 7 years	1	2	
Child under "	0	5	

I was not on the spot to ascertain how much grain the professional coolies really purchased; but the Civil Agency laborers generally bought from half to three-quarters of a seer. I think that the wages are ample. Most of these coolies bought rice, strange to say, though cholum was cheaper by two pies per seer. They preferred rice.

The price of the standard kind of food on which the wage is based is ascertained from the taluk tahsildar who finds out how that grain is sold in the bazaars of the principal villages.

It is my opinion that Sir R. Temple's allowance of 16 oz. of grain and half an anna is quite sufficient for Civil Agency coolies, who do scarcely any work or less than 50 per cent. The coolies working here, near Peapali, have done up about 10 per cent., and some even 0 per cent. These coolies gathered and broke stones. If the coolies are strong and are expected to dig earth, *i.e.*, do hard work, then I think that the men should be allowed a wage to enable them to buy 20 oz. of grain, and the women 16 oz., with half an anna each.

Mr. Macartney.—After giving considerable thought to the subject of wages, I had worked out a scale equivalent to one-and-a-half pounds dry grain and six pies for a man, and to one-and-a-quarter pound of grain and five pies for a woman, as being in my opinion the lowest wage which could be safely offered on Civil Agency works. But on subsequently reading G.O., No. 2847, of 24th September last, I found that the scale there laid down was exactly equivalent to the one that I had worked out. I therefore fully approve of the Government scale. It was my lot to witness the effect of the experiment of the 1 lb. grain + 6 pies per man, and 1 lb. + 3 pies per woman ration, and I regret to have to record my opinion that the result was most disastrous. A gradual process of wasting went on until a large number of laborers were unfit for work; and when, by his Grace the Governor's orders in Council, a more liberal wage was given, while a fixed amount of work was insisted on, I weeded out from my somewhat over 3,000 laborers no fewer than 850 in one day and sent them to the relief-house as the only place for which they were fitted.

Major Clarke.—The wages first offered to the famine relief coolies employed on the Buckingham Canal were based on the value of one pound of rice *plus* one anna, which was added to cover the cost of other articles of food. This sum was sufficient to meet the mere cravings of a hungry man or woman when two or three of one family could put together their little all into the common purse to meet their daily consumption, but it was not, as a rule, sufficient to develope the strength of the native pauper, nor to improve his worn-down constitution.

Quality and quantity of food purchased by the laborers with their daily wage differed widely in each locality, but I was led to believe that they were not able to buy the normal quality of rice, &c., and the laborers were, for the most part, imposed upon by the merchants or dealers. In my opinion the coolies should receive their wages every evening about 4.30 or 5 p.m., if such an arrangement can be made.

Hurry Row.—The staple food-grains of India are rice, wheat, joari, ragi, &c. I know that in wheat-eating countries, an adult requires 2 lb. weight of wheat-flour, ¼ lb. of dhal, and about ¼ anna for condiments. In rice-eating countries 3 lb. of rice and ¼ anna may be found enough.

MYSORE.

Ch. III. Qn 6.

Mysore.

Major Moncrieff.—I have no accurate data as to the quantity of food required to support human life, but in Mysore we were all satisfied I think that life could be supported on 1 lb. of grain (rice or ragi) with an allowance for the usual condiments, and that on $1\frac{1}{4}$ lb. of grain a man could do his day's work and take on flesh.

While the wage test is *based* on the price of food I think it a mistake to fix the wage lower than what usually prevails in the district. For instance, suppose a labourer can usually earn 2 annas a day and that grain usually sells for 48 lbs. to the rupee; also that relief works have been opened when grain is selling at 24 lbs. per rupee. For 2 annas he will be able to buy 3 lbs. of grain which is more than he actually needs. But it would be a mistake to make the wage lower. For the result may likely be that the labourer, failing to see why he should be paid less when grain is dear than when it is cheap, will reject the proferred relief, and the end of the Government will be lost. I would say then, start with the usual wage, and on no account begin by offering less. Raise the wage as prices rise, but do not make frequent alterations in it. Once a fortnight should be often enough to make any change. Be very careful about lowering it as prices fall up to that period when no danger is to be feared from labourers deserting the works. Then it may be as well to close them altogether.

Colonel Johnson.—The wage test should always permit of a man earning sufficient to keep himself in good condition by a fair day's work. The question as to the actual quantity of food necessary can be better answered by those who have been experimenting during the famine on the least quantity of food a man can be kept alive upon. This is driving the test a great deal too far. It was brought to my notice several times during the famine that the people were not purchasing sufficient food to keep them in condition, although their wages would have permitted of their so doing. I am of opinion, however, that this applied more to the professional beggar and skulking class than to real workers.

The labour test is the only real test that is necessary, or that should be applied to the able-bodied, and that not by task, but by piece-work. Task-work may be suitable for incapables when the quantity of work they turn out is not of much moment, and it is desirable not to work them too hard in order to get them sooner into condition fit to join the able-bodied, but for the able-bodied piece-work is the only system that should ever be applied. An idea prevails that at piece-work people who are in no need of relief will take advantage of the works and make a good thing out of them. There is not the slightest foundation whatever for such an idea. If the rates are properly fixed, no one is at all likely to come to work that is not obliged to do so for self-support, every man accustomed to employ labour in Mysore knows this. Piece-work with the rates properly fixed obliges a man to do a fair day's work in order to earn sufficient to live upon. It allows of his employing the whole of his belongings who may be able to do ever so little, and of his being able, by working a little harder to support those who are able to do nothing at all, and thereby keeping them out of reliet camps. It is the only test necessary or desirable, as it embodies the labour and wage test in one, and can be worked at one-tenth part the trouble and expense of any other system. Further information on this head will be given below.

No persons should be rejected because their appearance, clothing, or the ornaments they wear do not indicate penury. If willing to work at piece-work rates, it may be safely assumed they are obliged to do so. As before stated, the endeavour should be to keep up the physique of the people, not to let them starve first, and try to save their lives when it is too late. What is the use of keeping a man at starvation point all through the famine if he is unable to resume his usual avocations when it is over?

Question 7.—System of Payment.

Ch. III. Qn. 7.

What is the best way of paying wages, daily, or less frequently; at morning before work begins, during the day, or at evening when work is over; by calling out nominal rolls or by tickets, or by a combination of these? To whom should the payment of wages be entrusted? Explain the system of supervision most approved by experience, of checking payments, and of preventing laxity and fraudulent practices in the disbursement of wages? Have labourers been paid in grain, or partly in grain and partly in money? Under what circumstances is this desirable, and, if necessary, how is it best arranged? Have wages ever been paid by tickets, on presentation of which at a trader's shop food would be delivered? What would you advise in this respect?

Punjab.—Wages should be paid daily, in the evening, by calling out nominal rolls. Tickets not approved. Payment always in grain.

North-Western Provinces.—The majority is in favour of daily payments, to be made in the evening, and in money not in grain. Some officers are in favour of the ticket system. Payment by a special cashier.

Bengal.—Wages should be paid daily by gangs, the pay being given to the head of the gang. The cashier should be distinct from the supervising staff. Payment should be in money, not in grain.

Bombay.—12 answers. The general opinion is satisfied with weekly payments to be made by a special cashier, and in money, not grain or by tickets. The ticket system was not in force in Bombay; one officer advocates it.

Madras.—Twenty-five European and 3 Native gentlemen have replied.

Opinions vary as to the expediency of paying wages daily or less frequently. The latter is advocated where it can be done without hardship to the recipients, as offering less opportunities for fraud on the part of subordinates intrusted with payments, and enabling the labourers to purchase food at the weekly markets at more favourable rates than daily transactions with retail dealers admit of. They vary also as to the time of day at which payments should be made. Payment by nominal rolls is preferred to payment on tickets, and money to grain payments, unless there is a local scarcity of the latter. To guard against fraud all are agreed as to the necessity of employing European officers to as large an extent as possible to supervise payments, and failing this agency to employ Natives of known respectability only, who should be well remunerated. Measurement of work and payment of labour should not be intrusted to the same individual. If payments are not made daily the regular recurrence of the pay day is insisted on.

PUNJAB.

Muhammad Hayat Khan.—The best way of paying wages will be daily, in the evening, when the day's work is finished, by calling out nominal rolls. Only tickets for admission are required to be issued. It will serve as a passport for admission into the work daily. Payment of wages by means of tickets was tried in this district last year, but the system did not work well. In this district money wages were paid to the people. I am of opinion that payment in grain to the amount of the wage due to each person may, with advantage, be substituted for money wages as soon as the distress becomes very severe, and a scarcity of food grain is felt. I have no experience of food being issued on ticket.

Colonel Parsons.—The Deputy Commissioner has usually caused wages for relief works to be paid daily at evening when work is over; this method he considers the best. The ticket system is not adopted, as a list of workmen is maintained from which the roll-call is made in the evenings.

(*c.*) Further supervision is exercised by the district officers visiting the works, and ascertaining by personal inquiries whether payments are regularly made. (*d.*) Payment has not been made in grain but always in money.

Mr. Nicholl.—In my opinion the best way of paying wages is daily, at evening when work is over, by calling out nominal rolls. The payment should be entrusted to the officer in charge of the work, and to such of his paid subordinates as he can rely upon.

NORTH-WESTERN PROVINCES.

Captain Marshall.—Daily payments best suit the necessities of the labourers.

It is almost impossible to avoid making payments through subordinate native officials. The payments should, I think, be made on the works throughout the day for carrying, and in the evening for digging—the carriers being paid at once in *cowries* for each basket load brought, the diggers being paid by measurement; in the afternoon the muharrir who pays, or the sub-overseer, going round with his measuring rod and bag of money, and the diggers remaining by their tasks till paid. The general check on the measurements by the Assistant Engineer or upper subordinate should be sufficient to check peculation on any large scale.

Mr. Cordner.—(*a.*) Labourers in poor condition should be paid daily at first, others less frequently, say two to three times a week.

I would have no fixed time for payment.

The headman of a gang should keep a nominal-roll.

(*b.*) Payments should be made by cashiers temporarily appointed for the purpose, and not by overseer or sub-overseers of the Public Works Department.

I would give the headman of a gang an *interest* in the amount of work turned out by his labourers by means of a small per-centage on the work done.

(*d.*) I do not think that payment in grain is at any time advisable.

Mr. Atkinson, Ex-Engineer.—(*a.*) Daily.

(*b.*) In the evening when work is over.

(*c.*) By tickets. I have for many years and in many works, both in famine and not famine, used tickets largely in the employment of daily labour. Three, or at most four, rates of wages are established, and for each rate or class a distinguishing ticket. These are given out in the morning, as the bell rings for attendance and when they are seated in rows. A strict watch is kept that they do not abscond during the day. In the evening they are collected into one mass and pass one by one through an inclosure capable of admitting the labourers in single file only.

In centre of inclosure a table is put up, on which pice according to the different rates, is kept in rows; as each individual approaches the table his ticket is called out by an overseer, and he receives a corresponding sum from the disburser of cash. At the end of the transaction the tickets are counted up.

There are other details to render the scheme successful, and a very rapid and efficient mode of payment and good systematic management can thus be secured. I have worked over 2,000 people in this manner, and practice it to this day when necessary.

(*d.*) To those whose honesty can be relied on as mentioned above.

(*e.*) The system of tickets has, according to my experience, been the least productive of fraud. In single works the engineer or other officer should pay himself in the evening. During the day a guard should be placed at four corners, to prevent labourers leaving with their tickets and joining again in the evening. They are generally detected in the evenings trying to mix up with the gang assembled for payment. In scattered works the engineer or officer should appear at unexpected times and count the men with tickets. The cowrie system, so well known in North-Western Provinces is also a good plan and can be combined with tickets very advantageously and two main points—namely, attendance and payment according to quantity of work performed—ensured.

Mr. Sandys.—*Daily.*—By calling out nominal rolls at morning, provided the establishment is strong enough to admit of their preparation.

An officer in the Engineer establishment of the Public Works Department or a responsible civil officer.

Labourers are in the first instance divided into gangs of about 18, consisting of six men, six women, and six children, under a mate; 2ndly, eight or ten of these gangs are placed under a munshi, who, on the relief works in this district, has generally been one of the halkabandi school teachers. These munshis prepare returns of the numbers in each of the gangs under them, and after counting the numbers in the morning, give up the returns to a sub-overseer; 3rdly, the sub-overseer looks after seven or eight munshis, having generally about 1,500 men, women, and children under his charge. The sub-overseer forwards the returns of the munshis after checking them to the Assistant Engineer in charge of the work, who goes out every day with the original returns of the munshis and checks them himself. In the evening the totals of the payments to be made to the gangs under each sub-overseer are added up, and pice for that amount is either given out to each sub-overseer or to cashiers to distribute, the Engineer officer in charge invariably attending the distribution and satisfying himself that all are paid.

No labourers have ever been paid in grain.

No wages have been paid in grain in this district, or by tickets on presentation of which at a trader's shop food was given.

Mr. Tracy.—Daily, after work, by paying every man at his own place of work. To a trustworthy European or native subordinate. The officer in charge of the works should be present as frequently as possible, and take cognizance of all complaints.

Labourers in this district have always been paid in money. Money payments are best.

NORTH-WESTER PROVINCE

Mr. Lawrence.—Wages should be paid daily in the evening by tickets. Payments should be made by a different agency from that occupied in supervising the work.

As relief labour outside poor-houses has consisted altogether of earthwork, the labourers fall into two classes, diggers and carriers. The former were paid in cash at the Government standard rate, which varied according to the price of grain. In the event of the allotted work not being completed the defaulting gang were fined a pice each. Carriers were paid with zinc tickets, representing a certain number of cowries, according to the number of baskets of earth they carried. In the evening these tickets were exchanged for pice in the relief camp on the other side of the river. No carriers were allowed to earn more than one anna, which at the time this system was in force was always sufficient to provide for food laid down in the Government standard.

In the case of labourers who had not made up the anna worth of tickets the officer in charge of the payment made it up to an anna, if in his opinion the labourer had fallen short from weakness. People who appeared able to do the task received only the value of the ticket they presented.

The best guard against fraud is to utilize in supervision different Government services, non-commissioned officers and men of the native army, police, municipal, educational, and revenue officers. On no account should anyone temporarily employed for famine work have anything to do with money. All payments should be in the hands of permanent Government servants.

Payment in grain has not been tried, and does not seem advisable.

The zinc tickets were never cashed except by Government servants.

Lieutenant-Colonel Chamier.—Wages should be paid daily at 4 p.m. It is not fair to the labourers to keep them till the evening. Darkness brings on confusion and encourages baniyas to offer for sale inferior flour. Nominal rolls are preferable to tickets; the latter can be passed on from one to another; they give unnecessary trouble, and are scarcely legible. Grain has not been distributed on relief works, nor have wages been paid by tickets presentable at a trader's shop.

BENGAL.

BENGAL

Mr. Magrath.—There can be no doubt, in the case of real famine, of the absolute necessity of paying wages daily. The people otherwise cannot exist. They should be instructed to come at 5 o'clock in the morning, and should be counted as soon as conveniently afterwards. At 10 o'clock an hour should be given them, and at 4 o'clock they should be numbered and paid. By collecting the people into gangs, and having an overseer for a certain number of gangs, they should soon know all their gangs and be able to judge. The wages should be paid to the head of the gang, and he should be made responsible for his gang's attendance. Registers except of the gangers and the number of each class in each gang are useless. Payment should be made by a separate establishment; the persons who are overseers of labour having nothing to do with the cash, only being bound to report in case the cashiers do not pay in full. At the time of payment the gangs should be drawn up on their work, and the overseers and supervisors and higher authorities will thus have an opportunity of testing the gangs. No gang in one paymaster's length should be allowed to leave till all the gangs are paid, and all paymasters should commence payments simultaneously. By this method, and by having the paying staff distinct from the work supervising staff, fraud may be reduced to a minimum, but will never cease in India as long as the native is what he is. Payment in grain was a costly and laborious failure, as the grain had to be twice weighed, once in a large quantity from the gola, and then in small quantities on the spot, entailing a staff of weighmen never before required. It also tends to waste, as when men are served out so much rice they cook it and eat it, fearing that if they do not it will probably be stolen whilst they are at work. The distribution of dál, salt, and spices or green food is also work perfectly unfitted for an official staff. I think all officers who saw it tried in 1874 will agree with me that payment in grain is a wasteful and troublesome way of doing the work, and that it is almost impossible to check fraud. I gave it a trial because I was ordered, but I think that a money payment is the best. There was an attempt to pay by tokens (a costly experiment introduced, I think, at the suggestion of Mr. Bernard). It was only carried out thoroughly on the Public Works road, though Mr. Kisch tried it in one of my circles. The result was that the banias would at first only take the tokens for 14 annas, and finally for 10 annas, and but for the price of rice having been cheapened to 16 seers, the people would have been very badly off. I would advise the use of the ordinary circulating medium for payments and let the people spend it themselves. In this way you can, if the people are formed into gangs, pay with comparative ease and secure the greatest check if you have different persons to supervise the work from those who have the payment.

BOMBAY.

BOMBA

Mr. Hart.—The payment of wages should be entrusted only to cashiers acting under the immediate personal supervision of officers or trustworthy subordinates of the Department.

Colonel Jones.—Wages should be paid weekly or bi-weekly, according to circumstances. With new-comers four times bi-weekly, twice with four-day intervals, and twice with five-day intervals, and then weekly like the others.

If there are any people who cannot wait for three days, small sums can be advanced by the subordinate in charge, who should have a small imprest advance for this purpose. The payments should be generally made in the evening by calling out nominal rolls, and, if not finished, should be completed the next morning.

The payment should be made by cashiers, in the presence of either the officer in charge or some person deputed by him for the purpose.

With very few exceptions labourers were paid in money only.

General Wilkins.—Wages were paid, as a rule, weekly. Sometimes payments were made bi-weekly, sometimes daily. Daily payments were necessary for

III. Qn. 7.

OMBAY.

new-comers. Payments were always made in cash, and were conducted with much regularity. Officers made their payments in the manner they found best suited to the nature of their works. On concentrated works the payments were made after work was over. Payments on extended works, such as road works, were made sometimes during working hours by gangs in succession, being visited by the cashiers and officers; sometimes by payments made on Sundays, and in other modes adapted to facilitate the speedy payment of the people. The people were always paid by roll-call from the muster-rolls kept by karkoons. One karkoon kept musters of from 200 to 400 people. Officers were always present during payments. Wages were never paid by ticket.

I would strongly recommend the adoption of a ticket system for the payment of famine labourers.

Government should obtain from England card tickets similar to those in use as railway tickets. These tickets should be of different colours, representing the daily wages of the different classes, men, women, and boys. A coloured ticket would then represent a distinct amount. A man coming on the works would receive a ticket with the date stamped after the manner in use at railway offices. It is the practice to have one or more roll-calls during the day to see that the people are at work, and these roll-calls, when large numbers are concerned, affect the out-turn of work very materially. In place of having long sheets of names called out after the people were duly arranged, the subordinate in charge of the work provided with a ticket cutter would snip or punch the tickets of the work-people, either passing along the line, or the line filing before him. As men are, if absent, fined, a ticket with two snips would represent, say, a whole day's pay, with one snip half a day's pay, and so on. A cashier belonging to a certain work or works should take up his position at a pay office, and pay the value of the tickets over the counter on their presentation. In this manner payments would be made easier and better to all concerned, and the cashier would have his tickets for vouchers to his accounts.

Mr. Propert.—The method of the payment of wages is about the most difficult question connected with large relief works. As regards Khandesh it was never found absolutely necessary entirely to break through the ordinary rules of the Public Works Department on the subject, although occasionally weekly payments were substituted for monthly. At times, however, when distress was at its worst, we had to advance money to persons arriving on the works in a weak state, and the amounts so advanced were cut from the wages subsequently earned. In order also to prevent as far as possible deviations from the rules of the Public Works Department, on a few occasions I employed banias to advance grain to labourers on receipt of a written notice from the overseer in charge of the work that certain persons had earned a certain amount. I do not, however, like the practice, as the bania, of course, charges something for the accommodation. Daily payments are to be avoided as much as possible, inasmuch as the payments must interfere with work. On one occasion, in August 1877, when circumstances forced me to commence a relief work at a moment's notice, without plan, estimates, or even establishment, in the immediate vicinity of Dhulia, under Civil supervision, I found that daily payments must be given to prevent actual starvation. Such payments used to last from 5 a.m. up to 10 a.m., consequently but little work was actually performed. This was a special case, however, as Bhils and other turbulent classes were rushing for employment at the rate of about 1,500 per diem, and no proper arrangements had been made for their reception. The unruly concourse was eventually dispersed by a tremendous downpour of rain, which luckily commenced about a fortnight after the emergent relief work was started.

On a properly established relief work payments should, I think, be made weekly, with the necessary arrangements for advancing money or grain to new comers who are destitute. Avoid grain payments as far as possible, and on no account issue tickets for presentation at a trader's shop. Such a system leads to irregularities. Tickets should, in my opinion, most certainly be used, but they should be given by the overseers, &c. to workmen for presentation to the cashier, who should be quite separate from the supervising officer. Money should be given by the cashier in exchange for the tickets, and the tickets themselves act as receipts or vouchers for the total amount expended on each pay day.

Mr. Norman.—The wages on our works were paid once a week. In cases of necessity advances were given in the shape of orders on the grain dealers to supply food to recent arrivals until the receipt of the next weekly pay. Payments can best be made on nominal rolls, which should be repeatedly checked by the supervising officer. In this district it was never necessary, with a few slight exceptions, to make payments in grain. Wherever possible, it is always better to pay in money and allow the labourers to make the best arrangements they can. I would not advise payment by tickets, except when it is necessary to make advances. On Civil works payments were always made by the mamlatdar or some superior karkun under his orders. The officers of the Public Works Department will be able to explain what arrangements they made, and whether they would suggest any alterations in the mode of payment.

Mr. Spry.—I think weekly payments are the best and sufficient, but they must be made with undeviating punctuality. Saturday is the best day, because that gives the next day (Sunday) to the labourers to lay in their supplies.

I have had no experience of the ticket system; but should prefer cash payments on calling out the nominal rolls. The payments should begin in the morning by the cashier visiting each gang as it is at work, and paying each individual off then and there and in public.

The cashiers should be totally unconnected with the works beyond making payments, and should be men specially appointed and well paid.

One of the greatest checks against laxity and fraud lies in publicity in payments. The members of a gang know each other pretty fairly, so that if anyone is absent at the time of payment, or is represented by anyone else, the fact is generally known. Then, again, the supervising officer should be continually on the alert whilst payments are being made, and should test the rolls and make individual inquiries. Without these precautions frauds will soon crop up.

Labourers have never been paid in grain here, nor have tickets on traders' shops been issued. Not having had any experience on such points, I cannot offer any opinion.

Mr. Moore.—Wages should be paid daily, every morning if possible; if not, at least twice a week by nominal rolls. I think wages should be paid in money, not in kind, and the people should buy the grain for themselves.

Mr. Hamilton.—I think once a week is often enough to pay wages. I do not advocate payment in grain. Payment should only be made by trustworthy European officers, and at the time the work done is measured up. By the system of piece-work in family parties there is no fear of any frauds being practised. Payment partly in money and partly in grain was tried during the famine, but a great waste of time resulted.

Mr. Percival.—New-comers should be paid daily wages for a fortnight; after that weekly payments will do, as they arrange with the shopkeepers by that time. Wages should always be in money; it is easiest and safest for both parties, and there is less fear of cheating.

Colonel Anderson.—When the numbers are very great it is not possible to pay daily. But they should be paid at short intervals, not exceeding a week at most. Deferred payment means long running debt to the bania, karkoon, muccadum, or some one else, and the diversion of a material part of the wages to interest. In Bombay, wages were, I believe, never paid in grain, and I should greatly doubt the expediency of such a plan or it being liked by the people. Fraud would be greatly facilitated in several stages, in the purchase of the grain, in storing it, and in the final disbursement. I have never heard of tickets being used for payment. In all cases requiring numerous payments of small sums a difficulty always and at all times arises from insufficiency of small coin. A silver 1½ anna and 2½ anna would be very useful fractional coins for small payments; these might be square to distinguish them from the smaller round coins.

Mr. Robertson.—It is not desirable to pay wages daily, as such a system sadly interferes with work and entails the loss of a large portion of the working day. Wages should be paid weekly. On a large work certain gangs should receive their wage one day, other gangs the next day, and so on.

I cannot say, having had no experience, whether nominal rolls or tickets are the best, but I should be in favour of the muster-rolls. On works under the Public Works Department the wages are, I believe, paid by the officer generally entrusted with that duty, viz., a subordinate officer of the higher grade; but under Civil Agency by the special relief mamlatdar, regular mamlatdar, or first karkun.

Regarding the question of supervision for checking payments, and of preventing laxity and fraudulent practices in the disbursement of wages, I need not refer to works under the Public Works Department, that will be noted by the officers of that Department, but as regards Civil Agency works, the only feasible system appears to be that which was adopted in this Presidency—

(*a.*) Muster-rolls called over twice daily.

(*b.*) As trustworthy a supervisor or overseer as could possibly be obtained.

(*c.*) Payments made only by the higher native officers of the Revenue Department.

(*d.*) Constant and unexpected examination of the work and mustering of the people by the Assistant Collector or Special Famine Officer, by the Mamlatdar, and Relief Mamlatdar.

As long as there are not too many Civil Agency works in a taluka, these precautions have, I am glad to say, proved to be sufficient to prevent fraud.

Labourers have, when employed by municipalities, been paid in grain. In a few cases under Civil Agency they were so paid at the commencement of the famine, but this was as soon as possible discontinued. Payment by grain necessitates the purchase of grain by Government, interferes with local trade, and tends to interfere with a satisfactory supply of grain to the districts.

I am not aware of wages having been paid by tickets, on presentation of which at a trader's shop food would be delivered. I certainly would not recommend any such system. The only advantage it can be supposed to have is to prevent any peculation of the labour wage by the understrappers, but these people would soon meet you there by a combination with the trader.

The system would be most distasteful to the labourer; he prefers dealing where and with whom he pleases; he loves a little bargaining; he sometimes may not wish to spend all he receives on grain; may like, if he can, to aid a relative; while again the system would interfere with trade by giving one or two dealers a preference of custom.

Mr. Bosanquet.—Of course it would be best if wages could be paid daily, but there are two difficulties in the way of their being so paid. One is the great amount of time that is lost in making daily payments, and the other the difficulty of obtaining enough small coin for the purpose. If the labourers could be divided into gangs and each gang could be paid by piece-work, the value being calculated by a European officer, the difficulty of making payments would be much reduced. Twice a week is probably quite as often as the officers in charge of large relief works could arrange to make payments. If the measurements were made and the payments given by native agency, the European officer in charge of each work could check fraud on the part of the subordinate by personally measuring up the total work done.

Some of the questions in the body of paragraph 7 can be best answered by the Public Works officers, but I may state my opinion pretty clearly, that honesty in paymasters is not to be expected from subordinates receiving salaries of not more than Rs. 20 to Rs. 40 per mensem. The only way of preventing dishonesty and laxity with regard to payments would be either the adoption of piece-work payments, or by the payments, if possible, being made in person by the Executive Engineer in charge of the works, or by his assistant. I am under the impression that here payments were at one time made partly in money and partly in grain, but that such mode of payment was quite exceptional. The usual mode of payment was in money. When local traders have not the capital to enable them to import grain to sell to labourers, it may be well for Government to import grain on its own account in order to make grain payments. Wages were never paid here by tickets. I am not able to express an opinion as to this mode of payment. If it could be successfully carried out, one difficulty in making frequent payments to the labourers, that of obtaining sufficient copper and small coin, would be obviated.

Mr. Keyser.—On public works the system, which I know worked well, was to pay once a fortnight, and give advances after three or four days, or often less, after arrival on the works.

I believe it to be almost impracticable to make daily payments—

1. On account of the waste of time involved in payment.
2. The difficulty of checking accounts—a difficulty to be better explained by Colonel Melliss, Examiner of Accounts, Public Works Department, than myself.
3. The impossibility of measuring the work every day to see if tasks were duly performed. The minimum pay could, therefore, only be given, or part of a full day's pay, and this would involve a daily and a periodical payment.

As it was, the grain dealers who lived on the works gave credit and were present when the pay was issued, to get their accounts settled.

On Civil Agency works I paid weekly, and endeavoured always to arrange with the dealer at the nearest village to give credit in advance of the pay. There was never any difficulty except in one or two instances, where orders were neglected and pay not issued for periods of a fortnight or more.

Lieutenant de Villamil.—Wages are, of course, best paid daily. I think there can be no two opinions on this point; but it is not generally possible. I do not think it will be found feasible to pay the coolies *for any continuous length of time* oftener than every three days. If this be done regularly for five or six months I am satisfied that the arrangements will have been excellent, and will be all that can be desired. New arrivals and convalescents from hospital should be paid every evening for the first week or two, but as these will be in the minority, it will be perfectly feasible to get this done.

I have always paid and seen payments made on nominal rolls, but I think a system of "checks" or

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tickets would be good if care were taken to see that they were not "discounted." I have no experience of this, so cannot give more than an opinion on the subject. It will be best to carry on the payments all day; one gang can be knocked off work at a time and paid, when it can be made to resume work. Payment in the evening or on Sundays is generally objectionable as the coolies often receive less pay than their due; a larger staff would also be required for payments in the evening.

Payment in grain is troublesome and is very open to fraud; if proper bazaar arrangements are made on the work it will be found to be an unnecessary trouble and would probably not be popular with the coolies. Payment, partly or in whole, with cooked food would be good, but the same objections and reasoning will apply as to payment in raw grain. In June and July 1877, at Badami (Kaladgi), I arranged to get cooked food sold to the coolies by a little encouragement to some shopkeepers, and the result was excellent; it was very popular, and the only difficulty I found was in making the supply equal to the demand, as the dealers had not much capital. This system is infinitely preferable and probably much cheaper than interference on the part of the State, and it could easily be carried out on any work by taking a little trouble.

Prevention of frauds in payments is very difficult. I make the head-cooly and "maistry" responsible for the verification of their coolies during payment. If any complaints are made of non-payment I make the head-cooly (mate) pay the amount due and fine the maistry for neglect of duty. It is not, perhaps, a very legal method of operation, but it appears to work very well, and, practically, complaints are reduced. It is necessary, of course, to combine with this as much personal supervision as possible, and that is best done by making the payments *on the work* and *during the day.*

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Mr. Longley.—The best way of paying wages is to pay daily, if possible, in the evening when the work is over. I have never seen payment made by tickets, and cannot therefore speak about that mode of payment. Whatever system is least complicated is the best.

2. Wages should be paid by special cashiers, and such cashiers could not pay more than 500 coolies in an evening. The continued supervision of the European officer on the work is the only guarantee for payments being properly made, but, if the overseer who measured is present with the cashier who pays, fraud is less likely to occur unless both combine, and even then the coolies cannot be much cheated if the European officers on the work do their duty.

3. The laborers were never paid in grain.

If there is no bazaar near the work (which has not yet occurred anywhere in the district) grain payment will become necessary.

4. I object to tickets for food, which introduce the "tack" system. The cooly should be allowed to spend his money where, and as he likes, the only duty of the officer in charge being to see that a bazaar of sufficient size is handy to the work.

Mr. J. G. Horsfall.—In Ganjam in 1866 I paid wages daily, the early morning following the day for which wages were due. The laborers were divided into gangs varying from 20 to 50 persons, the gangs selected their own headman for each gang, and to him the wages were paid, leaving him to distribute. This system was consonant with the habits of the people, and it was very rare indeed that I had any complaints of non-payment. Each headman received one anna extra per diem. He furnished each morning the numbers in his gang—male, female, and children—and again in the evening. These were noted down at once by the gumastah or clerk employed by me for the purpose, compared with the nominal register, and checked twice during the day and the results furnished to me every evening. Once a week at least, and generally much oftener, the work done by each gang was measured and tested by me, and fines imposed for short work by reduction in that day's wages.

Payment in grain is very onerous, and I prefer the system adopted by me of selling to the work-people. Each headman took his gang to the depôt and was allowed to purchase not more than a limited quantity per head, and as the gumastah deputed to sell moved along the road, each gang was occupied but a short time in the purchase of as much as they were allowed.

I believe Mr. Martin, sub-collector, Dindigul, tried payments by tickets when works were first commenced in the Palair taluk in Madura district, but the system was soon discontinued. It did not commend itself to me at the time, and of this I informed him.

I think money payments preferable to any other. If necessary, grain-depôts may be established where Government grain may be sold at the bazaar rates.

Mr. Fawcett.—Wages were paid every second day in this division until the transfer of the works to the Public Works Department, and so far the plan adopted was found to answer very well. One mistake, however, was committed, I think, *i.e.*, paying in the evening instead of in the morning. I shall endeavour to put down what I think are the advantages and disadvantages of each.

In favor of paying in the evening it may be said :—

(*a.*) There is sufficient time during the day to get the money and grain brought and got ready for payment when work stops; while if payments are made in the morning before work begins there will often not be time, so that if payment is made the coolies begin work late. This defect in morning payment could generally, however, be easily remedied by better arrangements.

(*b.*) If payments are made in the evening the coolies have less money about them in the day time, and have less inducement to go away and leave their work. This, however, can be easily prevented.

On the other hand, the advantages of paying in the morning are :—

(*a.*) It has the effect of making coolies come punctually to their work.

(*b.*) There is plenty of light to pay away the money, and consequently less danger of the paymasters appropriating any part of it. It was noticed here that those road superintendents who could not be depended on, and the paymasters, always tried to make their payments as late in the evening as possible.

(*c.*) The payments are made more regularly, as they must always be made before the time for the coolies to begin work.

(*d.*) When payment is made after work in the evening, and is delayed till late for the reason referred to above, the coolies are kept up later at night than they need be. This affects their health.

The only objection to morning payments of any weight—the former of the two given—is one that could generally be got over easily by having a small depôt and treasury close to each work, besides the larger one for the range, and the three points of superiority over evening payments that the system possesses are, I think, evident.

Mr. Price.—I consider twice a week quite sufficiently often. Once a week, if payment *is regularly and punctually* made, is, generally speaking, quite frequent enough. I prefer paying in the evening. It is in accordance with established custom, and between pay time and supper time the coolies have plenty of time to make their purchases. Paying in the morning, or during the day, would, I consider, induce straggling. I have always paid by nominal rolls. I would certainly not do so by tickets, as, in the first place, the nominal rolls remain as vouchers, showing exactly to whom payment has been made, and, in the next, tickets can be sold or transferred. Combining nominal rolls and tickets might, perhaps, lead to the detection of a few petty frauds, but the double system would give very much more trouble than it is worth. I prefer paymasters under the orders and supervision of the superintendent or chief officer in charge. There is no effectual check upon payments of which I know or can suggest, excepting constant supervision and inquiry of coolies regarding the payments made to them. There is no paper check which cannot, in practice, be avoided. I always let the coolies know exactly what their pay was, and told them to complain if they received anything less. This they were by no means slow in doing. I have paid laborers in grain alone, and partly in grain and partly in money. I think it a costly process, and would resort to it only when sufficient supplies are not available in the neighbourhood of any particular work, and, perhaps, when coolies are at first taken on. The mode of which I approve is to have a store-house on the works, for the superintendent to indent on pay-day for the quantity required for each gang of his party, and to have this taken either by cart or coolies, as may be most convenient, to the usual pay place. It should there be shot out on a mat and served out. I always measured the grain without paying for so doing, by taking, at haphazard, two coolies from the gang being paid, one using the small and the other the large measure. This prevented cheating and quarrelling, and was entirely approved of by the coolies themselves. I have no experience of paying by tickets to be taken to any particular shop. I do not approve of the system. Tickets can be sold, stolen or lost, and there is the further chance of the shopkeepers, not only cheating in the measure or weight, but in the quality of the provisions supplied. The system which prevails in the normal state of the country, *i.e.*, giving the coolies their wages in money, appears to me the most desirable.

Mr. McC. Webster.—"Professional Agency" coolies should be paid every three days, and always up to the end of the previous day. "Civil Agency" coolies should be paid daily for the first fortnight of their admission; then every other day for another fortnight, and then every three days as "Professional Agency" coolies.

Both should be paid by calling out nominal rolls.

(*b.*) The payment of wages should be entrusted to a subordinate officer of the Public Works Department other than the officer who measures and checks the work and prepares the nominal rolls. I think that the duty of keeping the nominal rolls, measuring the work and making payments should be entrusted to three different officers. The maistry in immediate charge of the gang should keep the nominal rolls. A sub-overseer should check the work and sign the nominal roll as passed for payment, and the overseer (if possible) should make the payments, occasionally measuring up work. They even would thus be a check one upon another, and, owing to a division of labor, payments could be made more frequently and with greater regularity.

Mr. Crole.—The best time for payment is the evening. It should be made by mustering each gang and calling the roll. For feeble coolies, daily payments are necessary. The others should be paid bi-weekly. The duty of payment should be entrusted to the Revenue Department. Wherever the Public Works Department have had the payments in their hands, one of two things has happened. Either the coolies have not been regularly paid, owing to excessive attention devoted to tasking, defective management or weak establishments, or else the whole time has been devoted to making payments, and the work exacted has been next to nothing. The officer entrusted with it should make the payment to each gang according to the amount endorsed on the roll by the Public Works Department officer. Payments in grain are a mistake. They disturb trade, are bulky and difficult to make, and do not leave the person relieved with sufficient liberty to buy what food suits him.

Mr. H. T. Ross.—My experience has been that *daily* wages are necessary whenever the laborers are *bonâ fide* "famine" subjects. I tried less frequent payments, but found that starving coolies, who were allowed a bare subsistence of 1 lb. a-day, could not, when they got several pounds in hand at once, resist the temptation of eating more than 1 lb. a day, and so ran out of food altogether before next pay-day came round. I have also found the best plan in making daily payments to be to pay during each day for the previous day's work, the process of payment, if there were many coolies, taking several hours, but being so arranged in detail as not to interfere appreciably with work.

In arranging for grain-payments I found the best plan was to attach a regular store to each work, and to have the bags required for the day's payment carried to the work in the morning, and payments made there on nominal rolls exactly in the same manner as money-payments.

Major Baynes.—In framing a scheme for the distribution of wages the objects to be secured are, first, the regular recurrence of the payments; secondly, the full receipt by the payees of their respective dues; and, thirdly, the prevention of fraudulent charges against the employer. The first object is easily attained, because it is simply dependent on a matter of detail in the organisation of a sufficient number of measurers and payers, and in proper arrangements to secure money in sufficient quantity; but to secure the two latter is impossible if they be entrusted to ordinary native agency, however well supervised. The only method of securing them is to employ the direct agency of European officers; but as that would probably be considered too costly, we must be content with arriving as closely to their attainment as the use of European agency in general supervision, and the institution of a system of checks on the native payers will admit.

Weekly payments do not appear to me practicable for reasons hereafter given; if they be so, then they are much to be preferred to daily payments, because they diminish the number of paymasters, they require a more simple system of accounts, and they lessen the opportunities for robbing the coolies and for defrauding the Government, and also because they remove the necessity for carrying large quantities of copper coins for payment to the coolies; this last advantage is a great one.

If famine coolies arrived at a work with a sum equivalent to a week's wage in their possession, there would be no hindrance to the adoption of weekly payments; but as unfortunately they present themselves in a state of impecuniosity and of hunger, and as being strangers to the locality, they cannot obtain credit with the local shopmen, they require to be put in funds at once. It appears to me that the amount thus given to a laborer on arrival must not be styled an "*advance,*" for it is certainly *irrecoverable;* and that the total sum thus given to him must equal the wage for the intervals of payment obtaining on the work, in addition to the subsistence wage he may or may not receive on day of arrival; that is, if payments be made once in a week, then the laborer will require seven days' pay on arrival; if they be made daily, then one day's pay unless he were in the first case to receive daily an advance of one day's pay during the whole time he remained on the work. My reason for proposing to make the advance, or whatever it may be called, in a lump sum on arrival, is to prevent confusion of accounts and peculation. Reference to answer to Question 17 will show the respective duties of the clerk who registers admissions, and of the paymasters of gangs on nominal rolls; and if the payments of the latter are not strictly restricted to payment of *wage* for days worked and outturn shown in the nominal rolls, it will be impossible to check peculation, and to prevent confusion in the accounts. Payments on nominal rolls are debitable to cost of work, but advances of this description must be free gifts if the principle of the wage test be maintained, which limits a day's earning to a day's expenditure.

If dependence could be placed on the laborers that they would not abscond on the receipt of a week's wage as a *retaining fee*, it might be an actual gain in the long run to make to them this present; but as such reliance cannot be placed in them, the idea is not even worthy of consideration. Bi-weekly payments possess no other advantage than that of reducing the amount of advance; but as they necessitate a double number of nominal rolls, I would recommend the daily payment system. Daily payments can be carried on as a running account (to be adjusted weekly on some fixed day) when measurements are taken and the sums due to the coolies are calculated; but when the work of a gang is measured up for final payment, the nominal roll on which such measurements and payments are made should be sent into office for check and record; bi-weekly payments would, therefore, double the number of rolls and of measurements and of necessary calculations for payments to be made upon them.

I have already stated that to secure an honest distribution of wages the agency of European officers is necessary; failing this, I can only suggest the employment on high salaries of Eurasians or natives of well known and respectable families—strangers to the district, and unconnected with the Department of Public Works. They should be so well paid that any sum which they could make by petty robberies from the coolies, or fraudulent charges against Government, should be as nothing when weighed against loss of reputation and present emolument. A paymaster with eight gangs of 100 members to pay daily has full occupation; the amount of money which would pass through his hands in a month would be about 3,400 to 3,500 rupees. I think that a man to whom so much responsibility is entrusted should not receive less than 100 rs. per mensem. I would suggest the frequent interchange of paymasters on the works in a taluk or district, as this manœuvre is preventive of collusion between overseers, gangsmen, and paymasters. Payments at all events should not be made by the same person who measures the work for payment.

Supervision of Payments.—Coolies are liable to be defrauded in many ways. The most common are, short payment or withholding of wages actually earned on a fictitious outturn; deduction from amount of advance given on arrival at the work; and direct robbery by intimidation. The first method is simple, and only to be detected by measurement made by an European officer on the *same* day as by the overseer. The overseer in collusion with the gangsman informs the gang that they have done half a day's pay short work; but the real work done is entered in the nominal roll, and the proceeds, Rupees 6-5-6, are shared between the paymaster, the overseer, and the gangsman: if one day's pay be deducted only once a month from each gang, the proceeds of eight gangs would amount to 100 rupees which would make a tolerable addition to their respective pays; again, when a cooly arrives at the work, if he receives an advance, it may be, I fear, considered a certainty that he will have to pay his footing. Again, the coolies are openly robbed by the gangsmen; they threaten some member of the gang with expulsion on account of idleness or incapacity, or that they will report him absent or late, and so get small contributions from them to avert the greater evil.

Peculation.—Government is defrauded by false measurements in excess of actual outturn. The payments to coolies being made on the correct outturn, no one complains; and the overseer, gangsman, and the paymaster share the surplus. As before stated, these petty peculations cannot be *certainly* stopped except by the employment of an European officer to measure and see payments made; but I think the expedient suggested (above) would do so to a great extent. The only checks in way of supervision are to personally question the coolies as to the sums they have received; but the officer must be acquainted with the vernacular to do this. There is no use doing it in the presence of the paymaster or through an interpreter, for the coolies will never speak out under those circumstances. And the other is to make frequent check measurements on measuring up days.

Payment of Gangs.—Gangs should be paid on the places where they are at work. One paymaster should be able to pay eight gangs or 800 persons daily; each member of a gang should receive his exact due into his own hand. The practice of giving a rupee to a member of a gang to pay to others fractional parts of a rupee due to them is very objectionable; for it is the source of frequent disputes. Disbursements of wages should be attested in the nominal rolls by the initials of the paymaster and gangsmen. As payments are made daily, on an account which is closed weekly, a certain day in each week must be fixed for measuring up and adjusting the pay of each gang. The most convenient day for measuring up is Sunday, as, then, the coolies are off the works, and they are not delayed by the overseer while taking measurements; but this prevents Eurasian or European overseers from getting a day of rest, though in famine times no one should think about *rest*; another good day is Friday, as then the coolies are paid upon Saturdays, and Sunday can be appropriated to scrutiny of the rolls in office. However, this is only a matter of detail; the only principle is, that the recurrence of the pay-day must be strictly regular. On the day previous to that fixed for payment, the overseer authorised to measure up should go round his gangs in the afternoon, and should enter in the nominal rolls the amount of work done since his last measurement, as also the values of the different species of works done. The roll should then be taken to the paymasters by the gangsmen, the paymaster will compute each individual's pay and disburse on the next day. The limits of deduction to be made daily from any individual's pay are given in Appendix D., p. LXXIV., but should their aggregate sum cause any member's pay to be issued on the weekly adjustment to be less than the full pay of the class next below that in which he is employed, then an equivalent amount of stoppage must be deducted, so as to raise it to that amount. On works of Class II. this system must be slightly modified. On roads the overseer will go down his length a day before the paymaster, and the gangsman will await the arrival of the paymaster on the next day. After payments have thus been made in weekly adjustment, the nominal roll will be retained by the paymaster for submission to the cashier as vouchers for his payments, and the gangsmen should have a fresh roll prepared, which the paymaster should verify as a correct copy of the names on the roll he retains. The fact of his having done so will be attested by his initials at the bottom of the name column.

Payments made in grain or partly in grain and partly in condiments.—At the very commencement of relief operations this system was in force for a short time. The value of condiments appears to have been sometimes given in coin, but it is, in my opinion, an objectionable one; it involves intricate accounts, and it does not possess any advantage over payment in money, unless the Government are able to bring grain to the works at a cheaper rate than the local dealers, and even then I would not pay in grain. I should simply lower the wage to the reduced price of my grain, and leave it to the coolies to buy at the cheapest market; but this must not be done spasmodically; if begun, it must be carried through to the end; for if you supply grain for two or three months and fail, then the local dealers will not be prepared to meet an extraordinary run upon them, and moreover they will recover all past losses by future exorbitant prices.

Wages paid by tickets on shops.—This system was never adopted in my taluk, nor would I recommend its adoption; it would entail much extra writing, because the tickets would have to be filled up from entries in the nominal rolls, which have first to be represented in money and then expressed in terms of grain, and so any amount of discrepancies would arise. Moreover, it would not commend itself to the natives, because some might have a small private store of rice or condiments, and might not find it necessary to spend the whole of their earnings every work on the purchase of provisions.

Mr. Oldham.—The payment of wages would vary under Public Works Department and under civil officers. The following was my system:—

Special arrangements were made for persons who had newly joined the work and who are not entitled to a full day's wage.

The regular gangs were paid daily and in the morning, not before work began but while at work. As each gang was paid separately its withdrawal from work was no hindrance to the rest.

I insisted on daily payments because accidents often occur to interfere with the pay day, bad weather, death, flight or arrest of paymasters, non-arrival of remittances. With a bi-weekly or weekly payment any such interference tells hardly, probably fatally, on laborers on a subsistence wage. I insisted on morning payments for the same reasons. Evening payments were often interrupted or deferred.

The payment of wages was entrusted to a staff of paymasters who were subordinate to the Treasury and Account Department and not to the superintendents of the work. They were much lower in position than these last officers, and as they could be reported on by them were generally in some degree under their control.

The laborers were in gangs of fifty under a gangsman or head cooly, who was one of themselves and worked with them. Five gangs were grouped together under a gang-writer who kept the nominal rolls. All these subordinates were directly subordinate to the superintendent of work. To each paymaster were allotted eight gang writers' gangs to pay.

The coolies were paid in the morning for the preceding day's work. In the afternoon the gang-writer made out a slip, or abstract, specifying the number in each gangsman's gang, with a memorandum of any fines or deductions made by the superintendent during the day, and noted in the gang-writer's permanent nominal roll, and handed it over to the paymaster. The latter parcelled out the pay of each gang according to these abstracts. Next morning he and the superintendent briefly checked each gang by counting them, resorting to the nominal roll only in cases of doubt, and after adjusting his parcel of money if necessary, made it over to the gangsman or head cooly who distributed it there and then, and while the next gang was being checked. The delay at each gang from the beginning of the check till the last number had been paid was not over five or seven minutes. It was a particular rule that no money was ever to pass through the hands of the gang-writer, who was generally a Brahman. The gangsman was a fellow-villager and workman of the laborers themselves.

Thus the superintendent, who was generally a British non-commissioned officer, and the paymasters were the only subordinates trusted; while the gang-writer was not trusted at all. The distribution by the head cooly or gangsman took place in the presence of the paymaster and superintendent, and regarding it I never heard a complaint by the laborers.

Briefly, the best system for ensuring an honest and punctual disbursement of wages, is to have the disbursing agency separate from the subordinate agency for supervising work; to let the returns of the one agency be a check on the bills of the other; and not to overburden the work-supervisor with more than 3,000 people whom he has daily to muster, or the disburser with more than 1,500 whom he has daily to pay. Further, to leave the distribution of the pay to each individual to the work-people themselves, that is to their representatives, and not to a gang-writer or high-casteman who can tyrannize over them by reporting them for fines, for late attendance or for idleness, and so extort from them when he pleases.

Lieut.-Col. Prendergast.—Daily wages should not be given, except when people first come to work quite destitute. The best way is to pay gangs in succession, during the day, by nominal rolls. The payment of a large number of people at once is very tedious, unless there are a great number of payers. An overseer or other superintendent, above the class of sub-maistry, should be present when possible, to check fraud in the disbursement of wages.

Laborers have never been paid in grain; always in money. I think this is the best system. I have found that the people prefer weekly payments to more frequent payment: the reason is, that at the nearest village there is a weekly market, and they buy a week's supply at a slightly-reduced rate from that which they would give when purchasing casually on other days. This would not be the case in a town; but quite large villages have their special market-day once in the week, and in small villages especially, supplies are brought in on these occasions.

Captain Awdry.—Wages should be paid daily for the first fortnight after coolies come to a work, and then, as a rule, not less frequently than twice a week. I have known a case of the coolies preferring to be paid once a week, so that they could procure their food at the weekly markets. I, however, consider that twice a week payments should be made, one payment on Thursday for the work of Monday, Tuesday, and Wednesday, and one payment on Saturday evening for that and the two previous days; to this Saturday evening payment I attach considerable importance, for—

(1) it necessitates the accounts for the week being made up;

(2) it allows the coolies an uninterrupted Sunday for rest;

(3) it removes all arrears, so that coolies can go free to their homes and not return if they are disposed. Nominal rolls are called out; in the roll is the name of the cooly's father *which is not called out;* when he comes for his wage on his name being called he is asked his father's name; if he answers correctly, he is paid.

Captain Morris.—With a system of piece-work I should not consider it necessary to make daily payments, they might be made every other day; but if task-work is insisted on, payment should be made daily. The best time for this purpose is the middle of the day, when work should be stopped for a couple of hours, say from 12 to 2, to enable the laborers to have their mid-day meal, and advantage can be taken of this break to make payments. To pay in the morning before work begins would necessitate work being commenced rather late, and it is most desirable that it should be commenced as early as possible, so that the bulk of the task may be completed before the hottest part of the day. If payment were deferred till work was over in the evening, it would often, if not always, be dark before it was completed, and this might cause confusion. Payments by tickets would probably lead to the introduction of forged tickets on a large scale,

H. III. Qn. 7.

Madras.

and as payment must be made on or near the work, it appears as simple to pay in money at once, as to issue a ticket for payment.

No laborers have ever in this district been paid in grain, either wholly or in part, and I do not think such a system of payment advisable so long as grain is procurable in the markets.

Ruthna Sabapathi Pillay.—For the first week or fortnight daily wages may be necessary, but subsequently it is to the advantage of the coolies to pay them weekly. In these parts fairs or shandies are held weekly at certain places; at other places it is almost impossible to get any thing; even in places where shandies are held, except they be towns, on other than fair days nothing can be had. As fixing the price of grain at which it should be sold discourages trade, and people have not sufficient inducements to take grain to the camps, and we have one of the week days a holiday, weekly payments are good. Then two or three of the gangsmen join together and buy things and divide among themselves. Retail dealers take a longer time in selling the same quantities than a wholesale dealer, and has more trouble to undergo in the bargains. He must consequently sell at greater profits; and the cooly cannot, therefore, expect the same quantities when he buys for two annas as when he buys for a rupee. Daily payments are, therefore, embarrassments, detaining people from work, generally they have to go a distance to buy food, and even when they do go, not unfrequently they are disappointed.

Payments were made all in money. In places where traders cannot be induced to go, grain must be bought and conveyed and paid for wages. There should be a stock at the head-quarters of the division or sub-divisions, and distributed to the care of cashiers as money.

Rev. Newport.—The advisability of paying daily or less frequently depends very largely on the proximity of bazaars or markets to the place of payment. If the work is in the vicinity of a daily bazaar, it will be for the convenience of the people to receive a daily wage. They will daily purchase their daily supply of food, and never have a store either of money or supplies to tempt thieves. If a daily bazaar does not exist in the near neighbourhood, there will certainly be a weekly market near. In that case the wages should be paid weekly on the day preceding the market, or on the morning of the day itself if practicable.

Mysore.

MYSORE.

Major Moncrieff.—In times of real famine it is safest to pay daily, and in no case less frequently than twice a week. I think, on the whole, evening payments with nominal rolls the best plan, but there is much in favour of morning payments. The pay should be given in the presence of, if not actually by, an upper subordinate (overseer, supervisor, or sub-engineer) of the Public Works Department, and the engineer officer in charge should at pay time be present with one or other of the parties under him. I know of no system of check that can be devised if the officer does not personally see to payments, and if he does I think it enough. If he has parties scattered over a length of miles he cannot visit them all daily perhaps, but they ought to know that he may any time be among them.

If a system of labour tickets or tokens can be invented that would be safe from forgery I think it would work well, and they ought to be easily invented. Supposing they were ordered from England (or better still from France) made of some material not to be had in India, papier maché for instance, they would be quite safe.

Mr. Ricketts.—On piece-work, the only system I advocate for people able to work (although they may not be able to do a full task), the work is measured before it is commenced, and is divided so that the unit of measurement is a fair (generally easy) day's work for the people employed thereon. For the convenience of payment these units generally represent work to the value of one rupee or half a rupee. One or more of these units may be taken by any man, woman, or boy,* and they may employ thereon any number they please. One person's name only is put down, however, in the duffadar's books, and every unit completed is paid for each evening, a note being kept of any incomplete units. Under this system there are no nominal rolls, tickets, pay tables, or accounts further than so many pits at so much, and a tape run over the pits is a check at any time upon the whole work from the commencement.

When properly worked, one trustworthy subordinate is ample to supervise and pay 5,000 or 6,000 people, and there is no chance of fraud. This system was worked on the Durmaboody Tank, in Bangalore, and was a complete success.

If, however, the people are to be paid daily wages, they should be paid every evening; there is no trouble about it if properly managed. The people will, of course, be divided into gangs or duffas with a duffadar in charge of each. A maistry or sub-overseer in charge of a certain number of duffas, and an overseer or upper subordinate in charge of a certain number of sub-overseers' charges. The duffadars are responsible for their respective gangs, march them on to the work in the morning, and set them to work at once without any mustering or waste of time, the numbers are small and the duffadar at once sees he has so many men, women, and children, and puts down total number of each accordingly. The sub-overseer inspects each gang at any time afterwards, entering the numbers in this book. The gangs may be again counted and inspected at any uncertain period of the day by the sub-overseer, upper subordinate or officer in charge; and this is the only check on the numbers put down being actually on the work. The duffadars cannot admit any fresh people to their gangs after they have been counted, without the sub-overseer's order. In the afternoon, statement showing numbers of men, women, and children, in each gang, signed by the upper subordinates, should be sent in to the office, whence these should be handed over to the cashiers, who arrange the amount to be paid to each cooly on their tables, by gangs. When the work is over, the duffadars march their respective gangs to the pay tables, near which they arrange them, seated in regular order. On the duffadar's name being called, his gang files past the table, each cooly receiving his pay as he passes. If the numbers present in each gang do not agree with the statement a note is made and the matter is settled by the officer; no more are paid than are down in the statement, and as the money is arranged in accordance therewith any error is detected instantly. In this manner a very large number of people can be paid very rapidly. There is no necessity for any nominal rolls, which are utterly useless, waste an unlimited amount of time, and increase probability of fraud by necessitating a lot of mootsuddies to keep them. Under this system, if the officers and upper subordinates do their duty by keeping a sharp look-out on the sub-overseers, and by checking the gangs at unexpected times, there is not likely to be much fraud. The cashiers who pay the coolies have nothing else to do with them, and the officer generally and the upper subordinates always, should be present while the payments are being made

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* Not more than one or two units at one time however.

Ch. III. Qn. 7.
Mysore.

I have above explained that nominal rolls are quite unnecessary and most objectionable. There is no object in issuing tickets, it is as easy to pay in cash. Tickets may, however, be issued with advantage when, owing to the people not feeding themselves properly, or otherwise, it may be considered desirable to pay them in grain. The ticket should then represent either the whole or a part of the coolie's pay, and should only be interchangeable at the rice stores, or at some special bazaar fixed upon, for a certain quantity of rice, &c. This is by far the best way of making payments in grain, and keeps the grain transactions entirely separate from the cooly management or payment which is desirable.

QUESTION 8.—PREVENTION OF FRAUD.

Ch. III. Qn. 8.

What system do you recommend to prevent frauds by persons on the works, such as the receipt of wages by those who have not worked? What steps should be taken in the case of persons who have been absent at any of the roll-calls, or who have worked part of the day, but not all of it, or who, having worked during the day, are accidentally absent when wages are paid?

Punjab.—Persons absent to get no pay for period of absence.

North-Western Provinces.—

Bengal.—Similar.

Bombay.—11 answers same as North-Western Provinces Careful inspection of the muster rolls is recommended. Persons absent should be so marked, and paid afterwards.

Madras. — Fifteen gentlemen (Europeans) have replied to this question.

The system recommended is the careful organisation of gangs; regularity in keeping nominal rolls; muster of labourers three times a day, the intermediate roll call being at irregular intervals; making the whole gang the unit from which task-work is exacted, thus giving each member of it an interest in the sum to be paid to the gang; and in detecting and complaining of idlers.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—In answer to question No. 7 I have explained what I considered the best way of making payment of wages. I think that if those suggestions are acted upon, there will be little chance left for the practice of fraud. When any person will not answer to the call of the muster-roll he will forfeit his wage. A person working a part of the day will receive so much wage as he will be entitled to. With a view to prevent fraud I would also suggest that a person accidentally absenting himself will not be entitled to any wages.

NORTH-WESTERN PROVINCES.

North-Western Provinces

Captain Marshall.—The system of payment on the spot before the people leave the works, as detailed in answer to the last question.

Mr. Colvin.—Strict measurement, and payment through the group foreman. We have no roll-calls, and persons absent at payment time recover from their foreman.

BOMBAY.

Bombay.

Mr. Hart.—In case of total or partial absenteeism the rule should be that pay should be cut proportionally if able-bodied, or otherwise if feeble they should be at once placed on subsistence allowance.

Accidental absentees should be paid under the usual unclaimed wages rules of the Department, a guarantee being taken from the petty officers that no fraudulent personation occurs.

Colonel Jenkin Jones.—The officer in charge and the inspecting officers should at irregular intervals have the muster-rolls called out before them and ascertain that the entries are correct. Persons who are absent at the roll-call are marked absent, and those who have worked part of a day, ½ or ¼, as the case may be. Persons who are accidentally absent on pay day are entered in the Unclaimed Wages Book, and paid afterwards in the presence of witnesses.

General Wilkins.—The usual system in force in the Public Works Department, where the square opposite each person's name is marked off in a systematic way at each roll-call, prevents fraud.

The adoption of a good ticket system would prevent fraud.

Persons accidentally absent can always obtain their back pay on claiming the same, as they are marked absent on the roll-calls on pay day.

Mr. Propert.—It is difficult to recommend any one system to prevent frauds. If possible, establishments should be so increased by means of additional employés that it may be found possible on large famine works to bring into force the various checks usually adopted by the Public Works Department at ordinary times. The cases mentioned in the latter portion of section 8 must be inquired into as they arise, and decided equitably by the officer in charge.

Mr. Norman.—The frauds referred to in this question can only be checked by repeatedly calling over the muster-rolls and noting the absentees. Labourers absent from roll-call must forfeit the whole or half a day's pay; in no other way can discipline be maintained. Any special cases of absence from accident should be reported to the officer in charge for orders.

Mr. Spry.—It is only by publicity of payment and frequently testing the rolls that frauds can be prevented. If persons are absent at the roll-calls they are marked as such and paid accordingly. That they are not put down as present when really absent can only be checked by frequent and unexpected testing. When individuals are absent at the time of payment the power of paying them should not remain with the cashier. Such individuals should be required to attend the next day at a given time and place before the officer in charge of the work, or other superior officer. Their cases should then be inquired into and settled.

Mr. Moore.—It is difficult to prevent frauds of this nature if the overseers are corrupt. The overseer and the makadams of gangs should report all delinquents when payments are being made. Absentees through accident should be paid when they appear.

Colonel Anderson.—An essential point for preventing frauds is the frequent change of the karkoons and muccadums when immense numbers of labourers are engaged. I can imagine no system to provide for absentees from roll-call or for such as have worked part of a day; their payment will necessarily depend on the discretion or good-will of the muccadum, and it would as a rule be desirable not to recognize fractions of days.

Mr. Robertson.—If a person is absent at roll-call he would be entered in the muster-roll as absent, and receive no pay. If only present for half a day he would be so entered and only receive half day's wage. If absent when wages are being paid a note to that effect would be made, and he would be paid at the next pay day.

Mr. Bosanquet.—If work were paid by measurement, there need be little cause of anxiety about the improper obtaining of wages by persons who have not worked. If that were not found feasible the payment by gangs might be tried, payment being made to the persons selected by the members of each gang for the purpose. In the former case nothing would have to be done but to measure the work done and to pay for it accordingly. In the latter case trustworthy officers might occasionally in the course of the day be sent round to count the numbers in each gang. I believe, Mr. Palliser, the Executive Engineer for Irrigation, had some system of dividing the people into gangs on the Gokak Canal and paying for work by measurement, and that the system answered well.

The Rev. C. Harding.—The great difficulty which Government had to contend with was the dishonesty of the lower native officials, village officers, people in charge of the relief-houses, &c. They robbed both Government and the people. About 25 officials were dismissed in this district. I think there would be great danger of dishonesty if relief were intrusted to the village patels, but the more European supervision there was the less would be the danger. I think that with a system under which efficient European officers could look after the village patels and ascertain from them who were in want, and supply them with food in their villages, there would be less mortality than there has been now under the system followed in the late famine. A small amount of relief given at home will do more to support people than a larger amount away from home. I decidedly hold that people should be kept at home if possible. On this system peculation would be inevitable in spite of all possible supervision, but in spite of that the relief would be more effective. The European officer might go round and visit every village in a week and distribute relief himself. In a great famine any form of economy is impossible without great loss of life.

MADRAS.

MADRAS.

Mr. Price.—I consider that the best means of preventing frauds of the kind mentioned is to have roll-calls, at the least three times a day, and to make that between the morning and evening muster at irregular hours, dealing severely with any cases of absence not satisfactorily accounted for. It was a very common trick for a man or woman to appear at morning roll-call, go off directly afterwards, and return in the evening to be paid. These persons were, of course, often detected by the second and unexpected muster. I found that paying the absentee for the day and deducting the amount of his wages from that of the head cooly, who ought to have looked after him, was a very efficacious remedy. To prevent personation, which was by no means uncommon, I would enter caste and age in the nominal rolls. I would call morning roll at a certain fixed hour, allow an hour's grace, and, after that had expired, admit no one for that day, and of course stop his or her pay; in the case of those absent at the day muster, I would allow no pay unless they were satisfactorily accounted for, and to those who were present at the two roll-calls, but not at the last, I would allow half a day. In the case of those who had done their full day's work, but who were accidentally absent when pay was disbursed, the rule observed by me was that they received it next day.

Mr. Oldham.—The best plan for preventing the receipt of wages by those who have not worked is to make the whole gang the unit from which taskwork is exacted, thus giving each member of it an interest in the sum to be paid the gang, and in detecting and complaining of idlers. In fining a gang for short work I used by preference to fine the men, as they were able to make the women and children work, apart from the fact that the women are, on relief-works, by far the most conscientious laborers.

The framing of rules regarding the treatment of absentees at roll-call or at paytime depends entirely on the amount of supervision available, and consequently the extent to which refinements of detail can be carried.

Major Ross Thompson.—The system of piece-work which I have advocated above obviates all danger of fraud to any appreciable extent.

MYSORE.

MYSORE.

Major Moncrieff.—I can give no general answer. Give me good and honest subordinates and fraud will not happen, give me bad ones and nothing will prevent it.

Colonel Johnson.—I have explained how fraud should be prevented. On piece-work, with decent supervision, there is very little room for it. Payment by daily hire, by considerably increasing the supervision, &c., &c., makes fraud easier. In the manner I have indicated above, however, with efficient and honest supervision, there could not be much. Without it it would of course exist.

People absent from roll calls who have worked part of the day, or are absent when wages are paid, should be struck out of the statement, each case being decided on its merits by the officer in charge.

QUESTION 9.—WAGES IN SICKNESS.

CH. III. QN

What wage should be given to those who are prevented from working by sickness; (1), when there is a hospital attached to the work; (2), when there is none?

Punjab.—Poor-house rates, half wages, cooked food.

North-Western Provinces.—Where there is a hospital, hospital diet; where none, subsistence allowance.

Bengal.—Ditto.

Bombay.—14 answers. General opinion that there should be hospitals on the works, with special diet. If no hospital, the opinions as to the pay to be given vary.

Madras.—Ten gentlemen (Europeans) have replied to this question.

The general opinion is that, as a rule, when there is a hospital on the work those who are prevented by sickness from working should be relegated to it, and receive only hospital diet until they are able to resume work. Where there is no hospital it is recommended in the case of trifling ailments that the labourers should continue to receive their pay for not more than three days, after which they should be forwarded to the nearest hospital. This plan is recommended by some even when there is a hospital attached, and the medical officer certifies that there is no need for the person being admitted as an in-patient.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—Persons prevented from working by sickness will receive their food according to the scale laid down for the poor-house. If there be a hospital attached to the relief works he will be admitted in it, otherwise put in the poorhouse. From last year's experience I am of opinion that for a non-working man 12 chittaks of food will be sufficient, for a woman 8 chittaks, and for children 6 chittaks.

NORTH-WESTERN PROVINCES.

NORTH-WESTER PROVINCE

Captain Marshall.—When there is a hospital, hospital diet only.

When there is none I would give the subsistence wage in slight cases, and in all others remove the men to where the nearest hospital or relief camp may be.

BOMBAY.

BOMBAY.

Mr. Hewlett.—I think the sick should *not* be paid their wages whilst in hospital.

Mr. Hart.—Wages given in both cases should be mere subsistence allowance. I should make no distinction whether hospitals exist or not.

Colonel Jones.—(1.) When there is a hospital attached to the work the diet ordered by the medical officer should be given gratis.

(2.) When there is no hospital they should receive the usual working pay; but if they continue long sick they should be transferred to the nearest hospital.

General Wilkins.—No wages should be given to those who are prevented from working by sickness. They should be provided for in the field, or central hospital.

When there is no hospital the sick should be cared for in the nearest alms-house, and receive cooked food in lieu of wages.

Mr. Propert.—If there be a hospital attached to the work, patients should receive no pay, but cooked rations. If there be no hospital, half pay should be given to the sick.

Mr. Norman.—On works to which there is a hospital attached absentees from sickness must be placed on a separate list and fed under the doctor's orders. On works to which no doctor is attached the sick must be kept at a small relief camp or poor-house in the rear and fed on cooked food.

Mr. Spry.—Those prevented from working by sickness should, when admitted into hospital, be fed and not paid. Till they can be sent to hospital they must be paid at Civil Agency rates.

Mr. Charles.—When there is a hospital attached to the work, those who are prevented from working by sickness should get no wage, if their dieting is undertaken by the hospital. If it be not, or if there be no hospital, I think their wage should be the same as if they were working, as the assumption as to the famine wage is that it is the lowest on which health can be kept up.

Mr. Moore.—I would give no wage when there is a hospital; the people should be fed free. When there is no hospital the wage should be paid as usual, but a responsible officer should visit the sick daily, and satisfy himself that there is no malingering.

Mr. Hamilton.—There ought to be hospitals within access of every large work. Inmates should be fed gratis and receive no wages.

Mr. Percival.—It should be left to the doctor to decide what should be given to the sick, and there should always be a hospital. This furnishes an additional argument against small works,

Colonel Anderson.—Civil relief wages should be given when there is a hospital, with any addition required by medical authority when there is one to order it, which, of course, he would do under due restrictions. Sick people duly passed as such should get Sunday's wages. All people seriously ill, or for more than a few days, should be sent to a hospital, which should always be in the vicinity of a large work.

Mr. Robertson.—In Government Resolution No. $\frac{98\text{ E}}{348}$, of 13th February 1877, Government approved of the Superintending Engineer's instructions to the Executive Engineer, Belgaum, and ordered them to have general application in all the famine districts. These orders were, that sufficient subsistence should be provided to the sick employed on

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BOMBAY.

relief works (1) who remained under the medical attendant at the works, or (2) who, when there was no medical attendant, remained in his hut.

Mr. Bosanquet.—Such people, when in hospital, should be given the food certified as necessary by the senior medical officer present. If there is no hospital, and therefore no medical officer, they should receive the allowance of food given in the relief-house in the neighbourhood.

MADRAS.

MADRAS.

Mr. Knox.—If there was a hospital on the works any person prevented from working on account of sickness should be sent to it, and while under treatment should receive no wages, but should be dieted under the orders of the medical officer. While in this hospital his name should be kept on the roll and his expenses charged to the work. A sick person should not be allowed to remain here more than a few days, a week at most, but should then if not recovered be taken to the nearest large hospital or camp, his name being then struck off the roll.

Mr. Price.—I would give no wages to the sick when there is a hospital attached to a work. I would make them go on to the hospital strength and diet them there until fit to go out to work. When there is no hospital I would allow the coolies, if found to be really sick, and if they remained on the works, their pay until they could be sent to the nearest poor-house for treatment; but if they left and went to their villages, I would stop it altogether. There would of course be cases of the latter class in which hardship might be occasioned, but unless considerable strictness was exercised, and quitting the works was made punishable by complete stoppage of pay, there would be no keeping the coolies together.

Mr. Grose.—When there is a hospital attached to the work sick paupers should be supplied with food there, and paid no wages. If there is no hospital the wages in so far as they are subsistence wages ought to be continued, but to prevent paupers from malingering, they will have to be slightly reduced, say, by the amount of the fine inflicted for under-work.

MYSORE.

MYSORE.

Major Moncrieff.—The sick, whether in hospital or not, had better be fed with cooked food, not paid at all.

Colonel Johnson.—In hospital a man should be fed simply and get no pay, and there should be a hospital shed on every work.

CH. III. QN. 10.

QUESTION 10.—THE LABOUR TEST.

What are the principal descriptions of work on which fixed daily tasks are applicable, and what tasks have been insisted on? How are the labourers classified according to their physique; by whom and in how many classes? What steps are taken for raising labourers from one class to another, according as their physique improves, or vice versâ? How are they ganged, and into how large gangs? How is their work measured up; by whom, and how often? How are they punished for not completing their tasks? What steps should be taken to test the report of the measuring official, to secure that the labourers are justly punished or deservedly paid in full? What steps are necessary to compel persons receiving relief to work? In those sorts of work on which it is impossible to apply the task test, what test can be applied to ensure that the labourers earn their wage properly?

Punjab.—Earth-work. People in two classes, with able-bodied gang besides.

North-Western Provinces. — Earth-work. The labourers classed as efficient and inefficient. Those too weak for work sent to the poor-house. The labourers were divided into gangs of various strength, and various tasks required.

Bengal.—Works on fixed daily tasks defined as in Bombay. There may be two classes: (1) on piece-work or task-work, (2) on subsistence wage.

Bombay.—9 answers. Purport: Excavating, embanking, metal-breaking are the kinds of work. The tasks were 75 per cent. of individual capacity on P. W. D. works, and 50 per cent. on civil works. The labourers were classed generally in two classes by physique by the medical and civil officers. The gangs were from 50 to 200. The work was measured by overseers every evening. P. W. D. labourers were fined by reduction to civil agency wage. Labourers on the latter wage cannot be punished by fine.

Madras.—The principal descriptions of work to which the system of fixed daily task is applicable are: excavating, carrying, and filling of earth-work; stone breaking; spreading, rolling, and ramming of road material. The tasks generally insisted on have been from 50 to 75 per cent. of the out-turn ordinarily required by the Public Works Department, a higher rate of pay being given for the latter. Colonel Prendergast states that his experience is that the people prefer the full task, and try to come on the higher rate of pay as their physique improves.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—In his district there were no works on which fixed daily tasks were made applicable. Ordinarily the work of digging and spreading earth was assigned to the afflicted people. The amount of work performed was regulated according to the physique of the labourer. In my opinion a gang should consist of more than a hundred men. The duty of measuring works should, as far as possible, be entrusted to the Officers of the Public Works Department. When any person is found not to perform the full amount of work assigned to him, his wage should be cut. The report of the officer entrusted with the work of measurement will be compared with the entries in the Civil Officer's register of works. The officer in charge of a gang should occasionally examine the work. I cannot recommend any other punishment for not doing the day's work than that of "short diet," which will no doubt compel the labourer to perform the full amount of work. Care should, however, be taken that the people are not pressed to do more work than they can be expected to perform, and which will not prove prejudicial to their health. The duty of fixing task work according to the physique of each person is indeed a delicate one, and Civil Officers should pay particular attention to this, otherwise it will complicate matters.

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Punjab.

Colonel Parsons.—Road and other earth-work provide employment suitable for fixed daily tasks; in road works labourers of diminished strength are required to do top dressing and ramming, which are less laborious than digging and throwing earth. (*b.*) Two classes only are formed,—labourers equal to ordinary work, and those of reduced or inferior capabilities. (*c.*) When the working powers of any of the labourers are improved sufficiently to enable them to work fully, they commence doing piece-work, at which they can earn more than at fixed wage; the classes being in fact workers on fixed wage, and at piece-work respectively. (*d.*) The gangs are not of fixed numbers, but according to circumstances, with reference to number of men at the works. (*e.*) Work is measured up in the evening. (*f.*) Labourers wilfully shirking work get reduced wage. (*g.*) The official superintending the work is required to secure that abuses in this matter are not practised. (*h.*) The only steps to compel work of capables is to refuse relief, otherwise in this matter care is necessary to see that there is no misunderstanding prevailing, as all persons put down as recusant may not be so in reality, particularly in the case of distressed strangers. (*i.*) In works where task test is impracticable, close supervision is necessary to ensure that wages are earned.

Mr. Nicholl.—*The Labour Test.*—Fixed daily tasks are applicable on earthwork; the labourers are formed into two classes, the able-bodied to dig, and the less robust, women and children, to carry baskets. For hard soil, gangs of able-bodied, picked men are employed separately. Each gang has a piece of work marked off daily, and if this is not completed the mate is fined, or the labourers receive a reduced wage for that day.

Persons may be compelled to work by reducing their wages to the lowest possible limit. At the beginning of a famine it is hard to compel people to do what they have no inclination to do. When punishment is resorted to, they leave and seek work elsewhere. When famine is at its height, and other work is not procurable, labourers are then more tractable; for those who persist in not fulfilling their task, confinement on a low diet might, with advantage, be resorted to.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Captain Home.—Excavation is the only work on which I have seen fixed tasks applied; our task in the Bulandshahr Branch in 1861 was 150 cubic feet.

We did not class our labourers on the excavation, but sent the weakest into the poor-house, and put the fairly strong on to clearing jungle, hutting, and dressing earthwork; they were gradually drafted on to excavation as they got stronger.

They were ganged as far as possible by villages, about 40 to a gang under a mate, with a muharrir and mistri over 15 to 20 gangs.

The work was marked out into tasks every morning by the muharrir and mistri, and inspected every evening before payment was made. The work done each day was reported the next morning with the account of payments, and the measurements were checked by the Assistant Engineer in charge when a furlong had been completed. Short work was punished by short payments.

The Assistant Engineer was on the works morning and evening, and took notice of all complaints. As previously stated (para. 7), the Assistant Engineer, when the work was first started, made all payments himself, and thus established a system which the labourers soon came to understand and to appreciate.

This is a very important point, and in order to attain it, labourers should not be sent to the works in excessive numbers in the first instance.

People who would not work would not have been paid, but no instance of the kind is remembered.

Where no test can be applied, extra supervision would be required to ensure their doing a full day's work.

Mr. Colvin.—No task has been insisted on; the average per head of 35 cubic feet earned enough for 10 chittacks flour, and 3 or 4 pies over. It was open to labourers to do more or less as they could. Few did less; for strong men were not allowed to group together to the exclusion of weak, weak and strong being mixed in groups of 30 by the officers in charge. Inefficient gangs have only been introduced at a late stage of the famine here, and people are drafted out of them as quickly as possible. They are mere sinks of indolence and malingering, as a rule. The other questions have been answered above.

Mr. Sandys.—All the labourers employed on relief works in this district have been doing earthwork.

Where the digging is of ordinary difficulty and the lead does not exceed one chain, an able-bodied gang of six men, six women, and six children are required to do about 900 cubic feet of earthwork.

The labourers are classified into efficient and inefficient gangs, and those who are too weak to work are sent to the poor-house.

The classification of new arrivals is made every morning by the Engineer Officer in charge, who also transfers those from the inefficient gangs, who have improved in health and physique, to the efficient gangs.

The labourers are generally divided into gangs of 18, each gang consisting of six men, six women, and six children.

The munshis and sub-overseers measure up the work of each gang daily, and these measurements are checked by the Engineer Officer in charge of the work.

Till the receipt of Government Order No. 1933A, dated 6th July, 1878, all the labourers were paid at a uniform rate, but now those efficient gangs that do a full task get slightly better wages according to the scale laid down in the above Government Order.

The Engineer Officer in charge should test measurements himself, and see that the labourers are deservedly paid in full or not.

To give those who do a full task a higher rate of wage, giving a bare subsistence wage to those who do not complete their tasks.

The task test could not be exacted from the inefficient gangs; it must be left to the Engineer Officer in charge to obtain what he considers a fair amount of work from them.

Mr. Tracy.—The only description of relief works in this district has been earthwork. The tasks insisted on have been 80 cubic feet for a man, 40 cubic feet for a woman, and 15 to 20 cubic feet for a child over ten. The labourers are classified by the officer in charge in two classes: 1, able-bodied, and 2, inefficient. The inefficient receive tickets, the able-bodied are made to do task work. The labourers are ganged by hundreds, each hundred being in charge of a mate. The work is measured up every evening by native supervisors. Short work is punished by payment at a reduced scale as laid down in para. 8, Chapter I. of the North-Western Provinces' Famine Circular.

The only steps which can be taken to test measurements or to secure that labourers are justly punished or deservedly paid in full is frequent supervision by the officer in charge. People refusing to work are not relieved; those who do short work are paid in proportion. I have no experience of such works.

Colonel Burn.—Piece-work, in my opinion, is the best way to meet this difficulty; fix a fair rate for a full job, and lower said rate by sliding scale till it meets the capacity of the feeblest *from whom any* work should be exacted. Such rates should be fixed beforehand and printed, and, when the work is commenced, tables of the rates in vernacular be stuck up about the work, and those offering be allowed to try whichever scale they believe themselves equal to. I leave replies as to measurements to those accustomed to superintend such work. No punishments beyond refusing to pay for work not done.

Mr. Magrath.—Fixed daily tasks are wholly inapplicable to famine in any stage. It is impossible roughly to estimate how much a man can do until he gets into health, and then he is no more a famine subject. The only thing that can be done is to see that folks do not idle. Men who come for work early in scarcity, like the professional beldars and the artisans, should be assigned work to do and be paid for what they do. Throughout the famine of 1874 we had beldars, tantees, cotton-spinners, and the like, working for a very little above the ordinary wages, that little being due to the higher rate of food. But these men are not to be placed in the same category with starving agriculturists or town labourers. I only saw the classification according to physique tried once, and of course it turned out to be perfectly illusory. As appearances are most deceptive and are no guide to what a man may do, classification of labourers I believe to be cumbrous in execution and requiring a large staff. Gangs should be told off, and rough estimate should be made as to what they can do in a week. If it is found that they really cannot do it, the estimate should be reduced. If it appears that they are idle, they should be turned off the particular work in which they are, and sent as a penal gang to the civil officer to do coolies' work where he requires it, and where they will be under the immediate supervision of a task-master. We made up gangs of 20, including women and children, which answered very well as it included three or four families. Measurement is very costly for the large staff it requires and the accounts required to be kept. It also prevents the men being paid daily, as daily measurement of all tasks is impossible. The roads made by measurement were all of them of a very inferior description, pits being dug all about the place to enable each family to get its payment separately. Gangs of professional beldars of course can be, and ought to be, so employed, but it is useless to suppose that the plan will work for a mixed crowd. When you fix the rate high, the stronger men will get more than they should do; whilst if you fix the rate low, the weaker men will be starved. I never found any difficulty in getting the labourers to work. Of course, if they will not work they should not be paid, but a penal gang is always practicable. I had to put the lazy to unloading transport trains, loading up golahs under supervision. Until they did their day's work they were not paid. Under these circumstances I have had the men set to work at 5 o'clock in the morning, and finish a hard day's work by 1 o'clock, knowing that they would be paid and could go home as soon as the day's work was done.

Captain May.—Fixed daily tasks are applicable to earthwork on canals, embankments, roads, collection and breaking of road metal, moulding bricks, and pounding soorkee. Earthwork was chiefly done here, but no fixed task was insisted on because it was not permitted; work was started on the piece-work system but was stopped. The daily wage system was substituted, and subsequently piece-work was introduced when the labourers were classified, according to their physical capacity, by the subordinate and mate in charge of the work into classes—

I.—Those desirous of doing piece-work and to receive payment according to the quantity of work done and the rate fixed per 1,000 cubic feet of earthwork.

II.—Those who receive a bare subsistence for whatever work they could perform.

When labourers of the second class are fit to perform piece-work the only step necessary is to allow them to join gangs and earn what they can, and those who become unfit to work at all are transferred to relief-houses. In carrying out piece-work I have found best to lay out work and allow them to work in family gangs, and when their work is measured up, and payment made to the headman of the gang, they divide it among themselves. Piece-workers punish themselves for short work, but those on subsistence wages cannot be punished or retrenched for short work without starving them. All that can be expected is to prevent deliberate idleness, and to have those who are unable to do any work transferred to the nearest relief-house. The measurements of the subordinates in charge should be checked by the Assistant Engineer in charge of the subdivision, and when necessary by the Executive Engineer. Those who are unable and won't work should be turned off. Proper supervision on the part of the mates of gangs should ensure work from those on subsistence wages.

Mr. Finucane.—The only relief works of which I have had experience are roads and tanks. I think task-work applicable to both.

The task insisted on was 75 cubic feet of earth to be cut and put on the road in clayey soil, and 100 cubic feet in sandy soil.

An able-bodied man performing this task drew two and a half annas per day. This same task was exacted from two grown-up and from three younger boys. Very young boys or girls were not allowed to work at all.

Able-bodied men, who alleged they were unable to perform the full task, were allowed to get the younger members of their families to assist them, the wage fixed for the full task (2½ annas) being given to one only, and the family members being allowed to make their own arrangements for its division among themselves.

Those who were physically unfit for task-work were employed in smoothing the surface of the road, and were paid a bare subsistence allowance of from four to six pice per day. The circle officer examined these light-labour gangs from time to time, and turned off to task-work anybody who seemed manifestly able to do task-work. On the other hand, people who looked physically weak and unfit for task-work were always allowed to leave the "light labour" and join the task-work gangs if they volunteered to do so.

The labourers were arranged in gangs of fifty. Each gang would consist, as nearly as practicable, of residents of the same village, headed by a gangman, who was ordinarily the village mandal (headman) or some person of that kind known to, and trusted by, the villagers.

Over four or five of these gangs there was a mohurir or sub-overseer whose duty it was to keep nominal rolls and see that as many tasks were performed as there were multiples of two and a half annas charged. This duty was really very simple. Taking the gang as a unit and the allotted task, say 100 feet of earthwork, each gangman would arrange his 50 men, 25 on either side of that part of the road assigned him, would measure off with a bamboo pole 10 feet in length and 10 feet in breadth for each man, and direct him to dig out his allotment to the depth of one foot. The most ignorant cultivators very soon come to know the exact size of the allotted task, and fall into work without confusion or trouble *if only* task-work is insisted on from the beginning. The next gang would be similarly arranged at some distance from the first gang, and so on. On this plan there is no need to measure up every "task." It would be quite enough for the mohurir or supervising officer to ride along the road after the day's work was done, to make every man stand in his *chowka* or task, and to measure up a *chowka* here and there. One *chowka* may be a little more, and another a little less, than the full task; but the eye would very soon become so accustomed to the exact size of the full *chowka* that short work could be detected without minute and elaborate measurements. In cases where the full task was not performed, I would allow the wage for a half task only, and would not attempt to apportion out the exact wage due for the exact number of cubic feet dug. If any individual or any particular gang persisted in doing short work, I would either turn such persons off altogether, or put them on the barest subsistence allowance.

Mr. Kisch.—Avoid all classification of this kind as long as possible.

If works are opened in time, there should during the whole famine be very few who cannot do 75 per cent. of a Public Works task and who are fit for work at all. When it is absolutely necessary to have two classes of labourers of different physique, the division should be made by the chief executive officer of the division or circle. Under no circumstances should there be more than two classes of relief labourers—those doing 50 per cent. of a Public Works task and those doing 75 per cent. of a Public Works task. On the same work there should never be two classes of labourers paid according to different scales.

BOMBAY.

Mr. Hewlett.—I wish to say that I think labour, such as earthwork, should not be enforced in regard to some of the artisan class, such as tailors, weavers, &c. I have seen women of this class employed on work which they manifestly were most unfitted for. It is, in my opinion, very desirable that work suitable to them should be found, and I think weaving, at all events, might be allotted at relief works to such people in lieu of earthwork.

Mr. Hart.—Daily tasks are particularly applicable on earthworks and metal-breaking; also in some cases on masonry.

The tasks insisted on varied with the class of persons and character of work, but as a rule seventy-five per cent. of the capability of ordinary work-people at ordinary times was insisted on as a famine labour test, and the basis of an ordinary task system was that for a lift of less than four feet, and a lead of less than fifty feet, a man, a woman, and a child could excavate and dispose of one hundred cubic feet of earth.

The work was measured by overseers and sub-overseers every evening.

The pay of the work-people was cut in proportion as they individually fell short of task.

Close supervision and personal superintendence by superior officers, and the usual departmental checks of measurements, are all that are necessary to ensure correct payments to the people.

Colonel Jones.—Earthwork, such as road, railway, and canal cuttings, embankments, and earthen dams.

Where 100 cubic feet would be exacted in ordinary times, 75 cubic feet was taken on a relief work under the Public Works.

The labourers were divided by the district officers into four classes:—

1. Able-bodied people.
2. Weakly people, but capable of being moved to a distance from their homes.
3. Ditto, not fit to leave the neighbourhood of their villages.
4. The blind and infirm who have no one to support them.

The 1st class were sent to the Public Works Department;

The 2nd class to Civil Works;

The 3rd class employed on trifling works near their villages;

And the 4th class supported by the Government.

When labourers in class 2 were considered fit for the 1st class, they were sent to the Public Works Department, and, on the other hand, unfits were sent back from the 1st to 2nd class.

They were divided into gangs varying from 50 to 70, under a muccadum.

The work was measured by the subordinates employed on the works daily, and checked by the Executive Engineer or his assistants at convenient times. The labourers were fined in proportion to their shortcomings, and ¼ or ½ day entered in the muster-roll.

General Wilkins.—All descriptions of earthworks are suitable for daily task work, such as—

1. Tank excavations.
2. Formation of tank embankments.
3. Road cuttings and embankments.
4. Railway ditto.
5. Preparation of road materials.
6. Road repairs of all kinds, and other similar work.

The tasks insisted on have been 75 per cent. of a normal task for the able-bodied and 50 per cent. for the less able-bodied. Task work has been required on all works with more or less exactitude according to the establishments available. The labourers have been classified on the works by the European members of the staff chiefly, and by the overseers in charge of works.

The order of Government was that all people on public works were to be tasked 75 per cent. according to their individual capacity. Some officers divided their people into three classes, but as a general rule they were divided into two classes. The weakest class was set to carrying work, and the strongest to excavating. The people were divided into gangs, and their tasks set them in the morning. Whole gangs, not individuals, were fined for short work.

The working parties varied from 40 to 200 individuals, but the usual strength of the working parties was from 40 to 60 persons.

The work done was measured daily by karkoons and maistris. The overseers also measured work, and the officers checked the measurements from time to time.

Mr. Propert. — This is a question more easily answerable by an officer of the Public Works Department. I perceive that the question regarding the propriety of having a civil officer attached to large relief works is alluded to in para. 20. I will not therefore discuss it here, although in disposing of the question of "labour test" I consider that the assistance of a civil and perhaps also a medical officer is required.

It is of course idle to suppose that on a very large relief work it will be ever possible to carry out *fully* the hard and fast rules of the Public Works Department, but I do say that as far as possible they should be followed, and if sufficient departmental establishment be provided, assisted by a civil officer and a medical subordinate, I consider that a fair amount of labour may be obtained at a moderate cost. I cannot, from want of experience, satisfactorily answer the *details* of the present question. I can only advise as close an adherence to Public Works Department rules as circumstances will allow. If people refuse to work, I can really recommend no other course than the stoppage of wages.

Mr. Spry.—Excavating, embanking, and metalling are, I believe, the principal descriptions of work on which fixed daily tasks are applicable. The maximum task on the Public Works Department works was 75 cubic feet per diem. As regards Civil Agency works, 50 cubic feet was the maximum, but as a matter of fact the condition of the gangs taken as a body was so bad that very little real task work could be exacted. The task became more one of time than of quantity done.

When applicants came they were inspected by the officers in charge of the works and the civil officers, and if possible by a medical officer, and then they were drafted off according to individual capacity to either Public Works Department works or Civil Agency. Then again they were subdivided according to their condition. All working gangs again were continually inspected and individuals raised or lowered, as appeared necessary. As people came they were ganged off into gangs of 50 each. The work is measured up every day by the overseer, or rather it should be if practicable. The punishment for not completing the task is reduction of the wage to Civil Agency rates on Public Works Department works; on Civil Agency works such reduction cannot be made with safety, and the only thing to do is to insist on a time test. The overseers' reports and measurements should be frequently tested by the officer in charge of the work or by some special officer.

If cuttings have no effect on individuals who are incorrigibly idle, the only thing to do is to turn them off the works for a time at least.

Where task tests cannot be applied, strict time tests must be exacted.

Mr. Hamilton.—I look upon all classification of labourers as a mistake: it cannot be done satisfactorily, and the good results are, in my opinion, *nil.* Parties consisting of a family or two families of a village should be allowed to work together and have their work measured up once a week by a European.

If necessary, three or four neighbouring parties may be put under one mukadam, whose business it is to arrange that food can be easily purchased, and who frequently advances small sums to those who come on the works without enough to carry them on till pay day.

Individual task test, or indeed any other task test, I think is a mistake, and if properly carried out an enormous supervising establishment would be necessary. Let each party have its own excavation for earthwork, and the wages paid to each family would depend on the work done by that family party. In such cases the strong work with the weak, and no fear of lazy labourers need be felt. Any system of trying to compel people to work must fail where perhaps forty or fifty thousand people are on one large work.

Mr. Burke.—There were three classes of labourers —(1) the able-bodied, who did tasks of 75 per cent. of what would be expected in ordinary times; (2) the class who did about 50 per cent.; (3) the special gangs, who were newcomers or weakly and emaciated, but who were not fit subjects for the hospital, and these were not tasked. From able-bodied people the full task was exacted and their pay was cut in the full proportion of their shortcomings; from the second class a maximum of only one-fourth of their daily pay was cut, bringing it down to Civil wage. I was satisfied with the wage, and thought it enough and not too much; at the same time, I had heard and believe that some of the labourers saved a portion of their wages while on the work. The expenditure on the Ashti tank work was Rs. 3,09,595 to 31st March 1878, of which the actual value was Rs. 1,63,176. But the work closed at the end of November 1877, and a small portion of the expenditure under actual value was incurred from then up to the 31st March 1878.

If I had worked at piece-work instead of task-work, the expenditure would have been much larger, because the able-bodied people would have done much more work. Many of the able-bodied finished their tasks by 4 p.m., and could have done a full task instead of 75 per cent. Government, as I understand the question, did not want to get as much done as possible, and to pay accordingly, but to limit the total expenditure to the smallest possible and to obtain a fair return of work for the expenditure. Instead of getting a full day's work for a full day's wage of ordinary times, we got from the able-bodied three-fourths of a day's work for two-thirds of a day's usual wage. I don't think it would be possible to apply piece-work to weaker gangs, because of the difficulty of graduating the piece-work exactly according to the strength of each individual.

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Mr. Price.—Excavating gravel, spreading and tamping earthwork, and collecting and breaking metal are the principal classes of works to which tasking is applicable. In this district tasking appears never to have been attempted. In Bellary and Cuddapah it was, and a scale was drawn up there by me. My system of tasking was per gang of fifty persons composed of 20 men, 20 women, and 10 children, and allowance made in fixing the task for the gang containing persons in good, indifferent, and bad condition. Subsequently when the famine grew worse we found the state of the gangs such that they could not perform the tasks imposed, and we had therefore to divide into light-work gangs which had no regular task, and ordinary gangs made up of the strongest, who still had to turn out the usual task. There were only the two classes, and the classification was made by the European officers. This classification is not to be confounded with that made when examining into the physique of laborers on works, in view to a special periodical report for which Government called. When these latter classes were five, viz., "good," "fair," "indifferent," "bad" and "very bad," "good" and "fair" formed one set of workers, "indifferent" and "bad" the other, and the "very bad" were sent to the poor-house.

The coolies were frequently mustered and examined by the officers in charge, and transfers from time to time made. My system was to gang the fifty people previously mentioned under a head cooly, then to place eight such gangs under a head maistry, three of such gangs under a maistry and to put a party of 4,000 under a superintendent, he having, when this number was exceeded, an assistant superintendent. In Bellary, where I had a good staff, I measured up every day before the coolies were paid. In Cuddapah this was done as often as possible, but we had so very few hands and so many coolies that to turn out anything regular was simply impossible. In Bellary I used to strike off quarter and half-a-day's pay when only three-quarter or half-a-day's work was done, and when under half was turned out, the coolies concerned got nothing. After a fortnight of this system they gave little or no trouble. It was however put a stop to by Government when the one pound of rice wage came into force, and we were permitted to fine only up to the extent of condiment allowance, and then not more frequently than for a fixed number of days.

The only way to test the reports of measuring officials is to take check measurements oneself, or to have them taken.

As regards enforcing work, I would certainly carry out the system which we had in Bellary; it may appear severe, but half measures are not advisable when one has to deal with large bodies of people. Where

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persons who are strong enough and able to turn out a definite and easy task deliberately neglect to perform it, they should suffer in a way which they can appreciably feel the effects of doing so. If they do not care to exert themselves in the very moderate degree which will ensure their obtaining their wages, the conclusion to be fairly drawn is that they do not require them. I cannot say what test, other than the task test, when that is inapplicable, could be employed. The Department of Public Works, where work which cannot be tasked is dealt with, have certain scales by which they calculate and these could, I presume, be used in the case of famine works.

Mr. Grose.—Works to which the work-test cannot be employed should not be made relief works.

Mr. Longley.—Daily task is most easily applied to earthwork.

The tasks in the earlier part of the famine were light, and were not uniformly enforced. Since the Government Order of the 24th September they have been gradually raised for able-bodied coolies to a full task.

Laborers have only been divided into two classes—those able-bodied and the reverse. The classification was partly made by the civil officers, who, in sending coolies to the Public Works Department, sent them to professional agency works if able-bodied, and to civil agency works if not able-bodied, but the Department Public Works officers have again reclassed them remitting some to civil agency from professional agency works, and sometimes setting aside on professional agency works a section for those not able-bodied.

If any steps were taken for raising laborers from one class to another, this was done by the Department Public Works officers, but I doubt if this was ever done systematically, and the tendency has been either to laxness in permitting the employment on civil agency works of able-bodied coolies or to over-severity by exacting a full task from all irrespective of strength.

Coolies were punished for not completing their tasks by only getting civil agency rates.

I cannot conceive any form of relief-work which it is impossible to measure and so apply the task test, but, if it should happen that there is such a work, daily wage must be paid.

Mr. Jones.—Earthwork in road-making and picking and breaking stones for metalling roads have been the descriptions of work on which daily tasks have been enforced. Not less than 50 per cent. of the work which at the Department of Public Works valuation would be an equivalent for the day's wages has been the task insisted on. The able-bodied have been set to work averaging 75 per cent. of the full task, while the weaker have had only 50 per cent. to do. The gang maistries have in the first instance picked out and arranged the laborers, and their classification has been checked and revised by the superior officers in charge of the work. Each gang consisted of twenty-four coolies and a maistry or head cooly. Each gang had a furlong, and over each mile or eight gangs there was a mile maistry, who measured up the work daily, with the help of the gang maistries. The sub-overseer in charge of the road tested the measurements of the mile maistries daily.

Mr. Oldham. — *The labor test.* — The principal description of works on which fixed daily tasks are applicable are earthwork, stone-breaking, collecting stones, excavating and stacking metal, laying metal, tamping metal and carrying water, making mud and stone walls.

I used to classify laborers by physique as—first, those able for full work; second, those able for half-work; and third, inefficients. Full work meant an ordinary laborer's work in ordinary times. The classification was made by eye, with a special allowance for weavers. Having instructed my subordinates in its principles I left them to make it, and also left them to transfer individuals from class to class as their condition improved and *vice versâ.* Of course the superior officers watched their action. The Public Works Department officers pursued the same system.

The most manageable gang is one of fifty persons under a head laborer or gangsman who must be a working-man; not as was so generally the case in this presidency, a well-clothed official of the peon class armed with a stick. This gang with such a gangsman is the best unit for work. In Adoni last year five of these gangs were as much as a gang-writer could manage. In Chumparun, in 1874, one gang-writer or "haziri navis" managed ten or more gangs so constituted with ease. The gang ordinarily consisted of ten men, twenty-five women, and the rest children. Sometimes there were fifteen men to twenty women or similar intermediate variations.

The laborers are punished for short work by fines. As stated above, if the lowest fine was inflicted, I imposed it on the men only. If the whole gang had to be fined I used to fine the men twice as much as the women. If there are ten men in a gang of fifty people they can not only work themselves but make the women and children work too.

Major Ross.—Earth-work (digging by men and carrying by the women and children) and metal collecting and breaking. The proper task is never done; all the coolies know that they can, under no circumstances, be paid less than the civil agency rates; they consequently do as little as they possibly can.

The laborers are divided into two classes decided by the divisional or taluk officers. The engineer in charge may, if he thinks fit, raise a civil agency cooly to professional agency work, but the *vice versâ* arrangement is by the last order placed in the hands of the relief officer.

The laborers are ganged according to the nature of the work to be performed; if for earth-work, there must be a proper proportion of men for digging to the number of women and children for carrying; if for metal collecting and breaking, women and children alone are sufficient.

The numbers in a gang, of course, vary very much according to the work they are employed on, but 100 is about as many as a maistry can properly look after.

Lieut.-Colonel Prendergast.—Daily tasks are applicable to excavation of earth, sand, gravel, &c., including the carrying of the material away, either to be placed in position on a bund, line of road, to fill up hollows, or to be merely thrown away at a certain distance. Stone is collected and broken for roads, also gravel stored at road-side and laid down, water is brought and the road tamped. The tasks are fixed, according to the nature of soil excavated, the distance of conveyance of material, and the cubic or superficial quantity of work done, with reference to the task that a laborer would have set to him, in ordinary times, to earn a fair day's pay. There are only two classes of tasks: for the able-bodied and for the weak. My experience is, that the people have preferred the full task, and try to come on the higher rate of pay, as their physique improves. Those found incapable must be put on the reduced wages for lighter labor. The people are formed into gangs of twenty to thirty. The work is measured by the maistry after the day's work, or in the morning before the people begin again. If tasks are not completed, the gang is fined proportionally to the deficiency, provided that not less than civil agency rates are given. Nothing can be done beyond the check by a superior official to see that the measuring maistry has given proper credit for work done. We can only watch persons when put to work, to see if they really are unfit for it, or if they are deserving of relief

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without work: and without a task, in the same way, it is only by careful supervision that wages can be properly earned.

Captain Awdry.—Under orders received the strong and feeble have been mixed up together in one gang; I do not consider this system good as it demoralises the strong coolies. I would put strong and weak into separate gangs by the Public Works officers, who should pay the weakly gangs according to their *ability*, but *insist* on *full* outturn from the strong. The few who are absolutely lame, deformed, or decrepit should be classed as civil agency coolies by the civil relief officer on his inspection of the gangs, and should be made to work as much as they can, but this usually is practically found to be very little, and I consider that it would be better not to have such coolies on works under the Public Works Department at all. They should do the works of camps or sanitary work about villages.

Major Ross-Thompson.—When working a large body of people with a limited staff for supervision, *individual* task system is impracticable, and should not be attempted. With the piece-work system, the difficulties anticipated in this Query 10 would not arise.

Captain Morris.—The standard task insisted on in this district was four cubic yards of excavation per man in moderately easy soil, the proportion of women and children to each excavator being regulated by the lead.

It is hardly possible to divide the laborers into more than two classes for employment under Revenue and Public Works Departments' supervision, respectively. Even this classification involves a good deal of care and trouble. Those employed on civil agency works should be frequently inspected by a competent medical subordinate, and those who are sufficiently improved in physique can then be drafted to the works under professional supervision from time to time.

Mr. Russell.—The principle of setting fixed daily tasks can be applied to all descriptions of work, such as earth-work, road-work, &c. It is, however, most advantageously employed where the work is of a mixed description. From September 1877 to March 1878 tasks were entirely measured by "ability," professional agency coolies being required to do up to 75 per cent. of their ability, and civil agency coolies 50 per cent. of their ability. Since March 1878 a full normal task has been required from each individual on professional agency works, the civil agency task being, as formerly, measured by "ability," but being raised to 75 per cent. instead of 50 per cent.

There are only two main classes into which laborers are divided, viz., the civil and professional agency classes. The stronger men on a professional agency work are, however, employed solely on the hardest descriptions of work, such as in road-work, tamping with heavy iron rammers, or in earth-work digging. The weaker are employed on somewhat lighter work, while the women, children, and civil agency coolies are employed upon the lightest description of work, which, generally speaking, would be the carrying of earth or other materials. In this way the laborers are practically sub-divided into any number of classes according to the nature of the work.

Laborers are put into gangs of 50 strong, and people belonging to the same family, or coming from the same village, are invariably ganged together.

The work done by a gang is measured daily by the maistry in charge of the gang, the measurements are checked on the same day by the sub-overseers, and again checked by the overseer when he makes payments to the gang. The original measurements taken by the maistry and countersigned by the sub-overseer and overseer are filed, and can at any time be checked by the officer in charge of the work. I know of no method to compel people to work, except a rigidly strict system of turning off the work all such people who do not do the work, which, from their general appearance and condition, might reasonably be expected from them. Even when this system is strictly enforced, it is a long time before the majority of the workers will take the warning which it is intended to convey.

On work on which it is impossible to apply a task test the only test to ensure that wages are fairly earned is to make payments not on a daily wage system but by the whole piece of work done.

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Colonel Sankey.—Adoption of tasks to the exclusion of piece-work.— General definition.—The definition * of the task system is "that each individual is to earn a wage enough to provide "him with subsistence, but not enough to support the non-working members of his family." "Again † "the object to be attained is the relief "of the destitute, not the profit of the well-to-do, ". . . . a task will be required from each, *but* "*the labourer is not to be encouraged by any prospect* "*of additional pay to do more than his task.* ". . . . If the work falls short, a proportionate "reduction should be made in the wage, but the sum "paid must not be lower than that laid down in table B. "(a bare subsistence allowance) . . . . Should the "able-bodied cooly refuse to do his work or anything "like it, he is liable to be turned off altogether." Without making unauthorised allowances, the system thus defined is, to all appearances, a strictly penal one, opposed to the well-recognised principles for employing labour. While on the one hand it would tend to repel the well-meaning and industrious, it would on the other remain without terrors for the vicious and idle, if the penal clauses be not stringently enforced. So serious did the objections to this system appear to be, that I drew up the appended paper‡ for the consideration of the Famine Commissioners in Mysore.

Waste of public money entailed.—In this it is assumed that persons working under the impulse of self-interest would turn out work one-fourth in excess of what they would do under the task system; but this assumption was altogether below the mark. In one instance, which will presently be quoted from the evidence of the Famine Commissioner, the out-turn of work under piece-work was more than double that under tasks. If applied to a lump of work equivalent to the total of the Mysore P. W. Budget (of 25 lakhs), this would mean a loss of 14 lakhs to Government. But even this is too favourable a view, as, I believe, will be amply established, on measuring up and analysing the work actually performed in Mysore.

Evidence from outside.—Much the same results appear to have been obtained in Madras.§ Mr. Kirsh, divisional officer in the Bellary taluk, reported that, "before the adoption of the piece-work system by "village gangs, daily payments were made on all "works in the taluk, and it was found in practice "*impossible to exact any fixed task* from the very "large number of coolies on the works. My own

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* Letter from the Famine Commissioner to the London *Standard* dated 28th September 1877.

† Circular by the Chief Engineer and Secretary in Mysore No. of $\frac{1639}{2707}$ 12th September 1877.

‡ Vide Appendix VII.

§ *Madras Mail* for 20th November 1877.

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time, and the time of most of those under me, was occupied in counting the coolies on the works, and preventing the most ample and at the same time the most common frauds on the relief works. The public works' staff could not possibly measure up daily the works." As the results of adopting piece-work, the same officer observes, (1) "* the whole of the money paid out of the cash chest reached the coolies themselves; (2) * * * the returns of the coolies were absolutely correct; (3) * * the Government received full value for the money expended; (4) the daily cost to Government for coolies was less than according to the daily payment system."

Approval of piece-work by Sir R. Temple.—In his report on the condition and prospects of Mysore, 14th February 1877, Sir R. Temple observed that "all the work is done at ordinary piece-work rates * * * * so long as good useful work on irrigation tasks is being done at piece-work rates, perhaps it may not be necessary to begin any large works;" and Mr. Bernard, in the inspection report of the Kolar division, remarked: "The Deputy Commissioner said that 'the piece-work system was well known to all the people, who in ordinary years repair their tanks under that system; and the people would at once detect any attempt of the head cooly to make short payments for the work done.'"

Piece-work approved by the Famine Commissioner.—The most conclusive evidence on the point, however, is the order of the Famine Commissioner, Mr. Elliott dated 16th October 1877, on the work of the Timmenhuli tank in the Chittledroog district, from which the following are extracts: "The continuance of piece-work rates is contrary to the strict letter of the rules * * but I am inclined to think they may be allowed here for the following reasons—(1.) The work is a big one. At relief rates it would probably take 5,000 labourers four to six months * * (2.) It affords a good example and stimulus to the relief labourers. They see that they can earn more by piece-work, *and many have gone over voluntarily to that class; and many more will do so as they grow stronger.*" "At present, Mr. * * * gets 1 cubic yard for 3 annas from one class, and not more than one fourth of a cubic yard for about $1\frac{3}{4}$ annas from the other class (*i.e.*, at the rate of 7 annas per cubic yard); *so the piece-work is advantageous to Government, and it is not hard on the labourers, but is popular, and the labourers are in good condition.*" I have above sufficiently adverted to the fact of task-work being thus admitted to cost more than double the rate of piece-work, and will here only parenthetically note, that in this instance the lead must have been, or the supervision, lax, to run the piece-work up to 3 annas per cubic yard, as our ordinary rate is only 1 anna in soft, and 2 anna in stiff soils, with 50 yards' lead.

Piece-work practically reverted to in famine work.—So convinced was apparently the Famine Commissioner with the improvidence involved in the task system, after sufficient experience, that an order was consequently issued in the P. W. department directing coolies to be "tasked and paid *only in proportion to the work done*, those who do no work getting no pay." As no limit was imposed on what a man might do, this was simply a reversion to the piece-work system, with a very proper penal clause. Owing to the demoralised condition to which some of the labourers had sunk from the effects of free-feeding at the kitchens, this latter clause was doubtless essential; though the weaning effects of the piece-work system would, as above shown, in the case of the Timmenhulli tank, tell in the long run. In Colonel Merriman's final note on the Bombay famine, dated 22nd December 1877, under the head "Task Work," it is shown that the Government directed that "supervising officers should endeavour to introduce a system of task-work by gangs, which would enable the labourers without over-exertion to earn as much as their daily rate of pay, *or to earn more than that rate should they prefer to do so* * * *" It was further prescribed that under officers of the P. W. D. the "task should be fixed at not less than 75 per cent. and, on works under the Civil Agency at not less than 50 per cent. of the task that would be required from a labourer on full wages in ordinary times." I confess myself unable to see how this task-work differed in any way from the piece-work system of Mysore, or as regards the standard of physique (*vide* Appendix II., where 75 per cent. of the normal was adopted). In both respects the Bombay system as here defined, and that of Mysore, differed essentially from that introduced by the Famine Commissioner in Mysore, with the new *régime*. As I have elsewhere considered the task system in its bearings as a test to be applied during famines for the purpose of deterring those not in actual distress, it is needless for me to say more on the subject here.

Major Moncrieff.—A year's experience of relief works has taught me no rule or formula by which to answer these queries.

Earth work and breaking road metal and railway ballast are works on which a task can easily be set. Of course they depend very much on the nature of the soil and the material of the metal.

In Mysore, 4 cubic yards of digging in average soil was looked on as a good day's task. Two men or three women could break up 1 cubic yard of quartz metal. Five women could carry in baskets 2 yards of metal or gravel a distance of ¼ mile. Two men or three women could dig and stack 1 cubic yard of gravel. Labourers may be classified thus:—

1st. Fully able-bodied workmen to do full task.

2nd. The artizan of weaker physique, such as the weaver, tailor, &c., unused to this kind of work, and those on whom famine has begun to tell, capable of doing ¾ task.

3rd. The sickly and emaciated sufferers from famine and disease, but not including the old. These have been termed the *Special gang*, and should not be tasked at all, but every effort made to keep them at work.

4th. The aged who at no time would do a good day's work, but might perhaps be tasked at half work.

Classes 1, 2, and 3 should receive about 6 pie a day more than class 4, to whom a pure subsistence should be given. The higher wage is given to "the special gang," in the hopes of bringing its numbers up to full strength.

If a civil officer is present he should classify the labour. If not, the executive or assistant engineer. Not a subordinate.

The labourers should be inspected weekly and any removed to a higher or lower class as he improves in physique, or the reverse. It may often be better to amalgamate classes 1 and 2 in order to prevent the breaking up of families and then only 75 per cent. of the full task can be required.

Gangs should contain 50 persons, say, 15 men, 20 women, 15 working children. The work should be daily measured up by the subordinate in charge.

A fully able-bodied gang may be paid rigorously according to their out-turn and cut (I do not call it punished) for any short work. Gangs less able-bodied should never be cut below a subsistence wage except for very obstinate idleness. This cutting should be done with great caution, and if it ever becomes the rule and not the exception, it indicates some fault in the management of the work. Frequent inspection of trustworthy officers is the only way of seeing that all is going right in a division. Where the work cannot be measured up, everything must be left to the personal effort of the subordinate in charge who must himself remain on the work and see that the people do work.

Colonel Johnson.—The system of piece-work advocated by me gets rid of all complications and is applicable to every description of work on which famine labour need be employed. The principal

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classification I insist upon is the separation of the able-bodied from the others. Piece-work, however, is applicable to others as well as the able-bodied if they will work together—all that is requisite is to raise the rates 75, 50, or 25 per cent. as may be considered necessary. It is absurd to expect a man will do 12 yards per rupee, while others close by are only doing nine or six, or even three, and the able-bodied gang must therefore be kept clear of the other. If they will not do piece-work, a lump of work must be measured out for a certain number and they must be ordered to complete it by night. Labourers must be raised from one class to another by the officer in charge of the work; but it is of no use his doing this, unless he can insist upon the additional work being done. What steps should be taken to compel them to do this, how they should be punished if they do not, had better be left for Government to decide. All I can say is, they should be compelled to do their tasks, and they should be punished if they do not; and it is chiefly on this account that I consider it so desirable that men having magisterial authority should have charge of those who will not work. The two great points to be arrived at are: 1st. To prevent the able-bodied from falling off in condition. 2ndly. To get all those who are not able-bodied into that gang as soon as possible. Public Works men will work the able-bodied to the best advantage, and keep them in order, provided they are not allowed to march back to the 75 or other percentage gangs. Public Works men may, of course, also work the 75 per cent. gangs on the same terms. For the more incapable gangs, the supervision, though perhaps of more importance, is not of the class suited to Public Works officers, and in my opinion had better be left to special selected revenue, relief, and medical men. There is, however, one important fact to bear in mind, which is, that if matters are made too easy for these classes, and proper classification be not rigidly enforced, it will be impossible to manage the able-bodied efficiently. It should be a *sine quâ non* that the able-bodied should be able to find nothing more attractive in the works for the classes below.

So far as I am aware, during the late famine any attempts to punish people for not completing their tasks were farcical.

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Question 11.—Piece-work.

Under what conditions, if any, is payment by piece-work practicable on relief-works, that is, payments for quantity of work done at a fixed rate, irrespective of the amount of daily earnings? What are the advantages and disadvantages of the system? When it is advantageous, how can it be best adopted on a large scale, and what precautions would be necessary to prevent its abuse?

Punjab.—Piece-work not objected to if care is taken to fix the rates so that unskilled labour can subsist on them.

North-Western Provinces.—Opinions not generally adverse to piece-work, which was used to some extent in 1877 by forming mixed gangs. Some officers, however, contemplate piece-work, through contractors. Payment by cowrie also recommended.

Bengal.—The opinions are in favour of piece-work on the system of village gangs.

Bombay.—6 answers. The opinions are mostly adverse to piece-work, of which the officers reporting have little experience in famine.

Madras.—Twenty-six European and 1 Native gentlemen have replied.

There is almost an unanimity of opinion in favour of piece-work, so far as able-bodied labour is concerned, on the grounds of economy to the State in ensuring a fair return of work with a minimum of supervision, of affording encouragement to the labourers, and of minimising the opportunities for fraud and peculation. The disadvantages stated are that it favours the strong and discourages the weak, and that Government has to pay more per head than the price of mere subsistence.

Punjab.

PUNJAB.

Col. Parsons.—(*a.*) Piece-work is practicable in all relief works to a considerable extent. (*b.*) Deputy Commissioner is not aware of its having any disadvantages, provided the rates are not such as to render the earning of a fair wage (*i.e.*, sufficient for daily food) by unskilled and fairly strong men impracticable. (*c.*) With a view to provide relief to a large number from any given work of special relief nature, the payments to individuals can be limited by fixing a maximum daily limit of work and wage for individuals or petty gangs.

Mr. Nicholl.—Piece-work is very good, where a given piece of work has to be completed within a given time, and a fair rate is given; but if famine wage rates are applied to the quantity of work done, there is no advantage in adopting this system; *e.g.*, it has been ascertained that an ordinary labourer can dig 100 cubic feet per day, and the rate for earth-work prevailing in the district is 3 annas per cent.; if this rate were given the work would be done quickly, but if say ½ that rate only were given, or 1½ anna, the same amount of work would not be done. If the object be to employ a certain number of people over a given period on a particular work exacting a fair day's labour from each, then the piece-work system is of no advantage; what a fair day's labour is can be decided in each case on the work.

I have tried the system, but the people would not do a bit more than their ordinary share of work unless I raised the rate on the quantity of work ascertained to have been done. They said they did not care to over-exert themselves without an inducement, as under any circumstances the Government were bound to maintain them till better times come round.

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NORTH-WESTERN PROVINCES.

Captain Home.—Payment by piece-work is only practicable where the labourers employed are people who are in the habit of gaining their living by excavation and are accustomed to it. It should be optional, as it could hardly be applied generally to the miscellaneous collection of classes who are gathered together on a relief work. To be useful the "piece" should be equal to at least three days' work. The advantages are that less supervision and less frequent payments are required, and that the work would probably be done cheaper.

The disadvantages are that the work-people may not be able to wait for payment till the piece is finished, that the labourers working in the same piece must be known to one another, and that the labourers may be driven away from the works owing to the work given being out of proportion to their strength.

To adopt piece-work on a large scale, the people of the same village should be grouped together under a mate of their own selection, and a certain length of the work allotted to each gang in proportion to their numbers; about ten days' work would probably be a convenient amount. Payments would be made through the mate in presence of the gang at convenient intervals on measurements. Should any disputes arise they could be easily settled.

Mr. Cordner.—(*a.*) Not only do I think the piece-work system practicable on relief works, but (*b.*) I consider that it should be the very backbone of the whole system.

During the Bengal famine of 1874 I had charge of the relief works in the Purneah district, and from the very commencement of the work I introduced the piece-work system, and which, though *at first* strongly opposed by the people, worked in a very satisfactory way when completely established and understood.

(*c.*) The following is a brief account of the system. The works consisted in new embanked roads in various parts of the district and varying in length from 20 to 80 miles.

As soon as the project was approved of and the necessary levels taken at every 100 feet, profiles were put up and the side cuttings marked out, in which a *uniform length of* 90 *feet was adopted* for every 100 feet of the road. The depth of the cuttings was also uniform (within certain limits in height of bank), so that the only variable was the width.

I had tables made out which at a glance gave the width of a side cutting for any height of banks, the quantity in each chain, and its value at the various rates prevalent in the district.

Two sets of tables only had to be made out, as the roads were divided into two classes, 20 feet and 16 feet at tops and side slopes 2 to 1.

As applicants came on to the work they were divided into gangs by villages, and according to the number in each gang; a greater or less number of chains of the road were reserved for that village, so as not to have two gangs working close together.

Each gang elected their own headman or ganger, and to him all payments were made, and by him distributed to his gang. This man was paid two annas a day, but did no actual work.

Payments were made from two to three times a week in the following way:—The sub-overseer would come to a gang, and, if they had completed a side cutting, all he had to do was to measure *the width* of the side cutting, and a glance at the table (a copy of which he was supplied with) told him exactly what was due to the gang at the rate fixed for the work. If the whole of a side cutting was not completed, he would roughly estimate the amount done and pay for it on account. After measuring the side cutting, he would fill in a form (copy enclosed) giving quantity and value of work, and also an order to the cashier to pay.

The ganger would take this slip to the cashier, who had an office at some point on the road, so that no ganger would have to go more than five miles to get paid. After being paid he would sign the receipt part of the slip, and the cashier would enter the transaction in his cash-book and send the slip to Executive Engineer's office as a voucher, when his imprest was recouped.

No cash was paid by anyone but the cashiers, who were nearly all appointed on the recommendation of the Collector of the district, security having been taken from them. Their imprest varied from Rs. 2,000 to 5,000 each, and they were recouped direct from Executive Engineer's office.

The checks on the system were as follows:—Every member of the establishment had a table of quantities and value of work supplied to him, so that as he passed along the work all he had to do was to take the width of a tank and ask the ganger what he had been paid for it. He could see also from the table that the width of side cutting was correctly laid out for the height of the bank. In Executive Engineer's office a record was kept of the total estimate of work in every chain of the road, so that the sub-overseer was checked there from overmeasurement, as he had to note on each slip the number of the chain for which the bill was made out.

These slips, though very simple in character, form a complete record of the work. The sub-overseer and cashier kept counterfoils of what they signed, and the original was sent to Executive Engineer.

As the light-labour works were in charge of the civil officers of the district, when unable-bodied men came on to the Public Works Department works, they were put on light work (such as breaking clods, &c.) on daily pay until they could be transferred to the light-labour gangs, the civil officers being responsible to take over charge of them as soon as possible after notice had been given to them. I think the piece-work system could also be adopted for labourers not in good condition, by putting them in gangs by themselves and giving them a higher rate for the work than what the able-bodied would get.

Major Jeffreys.—*Piece-work is practicable* (1) when the works are *large* and *confined within a small area*; (2) when there is a *large supervising* establishment. The advantage of such work is that a stricter task can be exacted from the labourers than by any other method. The disadvantages of it are, that frequent and even daily measurements are necessary; the supervising staff are soon worked off their legs.

Earth can be removed by the *cowrie system*, which is another *species* of piece-work. It consists of paying a certain number of cowries or tokens for each basketful of earth carried. All classes of carriers, of any caste, age, or sex, will do this work cheerfully when all other systems fail, and the result, if properly managed, may be made to show a satisfactory and moderate rate. The diggers have to be paid separately by the day or according to their task. This is the kind of work, next to contract work, that most commends itself to me, and it gives the least labour to the supervising establishment and offers the fewest opportunities of systematic fraud. It is by far the fairest and most equitable to carriers, for every woman or child knows that she or it will obtain an exact equivalent for her or its labour without fear of being defrauded at the expense of another. The advantages of this system are so manifest that one who has once employed this system would never adopt piece-work if he can help it.

Mr. Colvin.—I do not understand the distinction between the piece-work and a fixed labour task. All our work in the previous sense was piece-work. A khassa holding so many cubic feet at so much money per hundred cubic feet was worked out and made over to a gang of 30. They might do it in half a day,

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in a day, or in three days; but they would only be paid its value.

The mixing of strong and weak in the gangs prevented abuse.

Mr. Sandys.—Payment by piece-work would be practicable on relief-works if the Zemindars or headmen of villages and not ordinary petty contractors came forward and took contracts on condition of paying their tenants or residents of the same village at a fair rate. The advantages of this over the daily labour system would be, that a much smaller establishment would be required, and inhabitants of the same village would be kept together. The disadvantages are that a sufficient number of Zemindars or headmen would not be willing to take contracts so as to relieve all who are in distress in their village; they would not employ the weaker ones, and would endeavour to make the most they could out of the contract, and would not, as a rule, make daily payments, at least it would require very strict supervision to make them do so.

The piece-work system was only adopted on a small scale in this district.

Mr. Kennedy.—The relief works started by the municipal committee of Shâhjâhanpur in August and September 1877 were all done by piece-work. The applicants were formed into mixed gangs containing both strong and weak, and were put under the contractor, who received one-fifth of the amount paid as his share of supervision. Thus supposing the rate per thousand feet of earthwork was Rs. 1-8-0, the contractor would get four annas and the labourers Rs. 1-4-0. In one case over three thousand labourers were employed. In this case the system was only possible because these works were started at the very commencement of the pressure, and before the people's strength had been exhausted. It was possible therefore for them to give full work. The condition of those who came later was much worse, and they could not earn a sufficient livelihood by piece-work. This year the relief work under the municipality has been chiefly paid for by day wages in accordance with the Public Works system, but latterly the ordinary gangs have been employed at piece-work, indigent gangs only being paid at day wages. As the result of this experience, I should say that piece-work is practicable at the commencement and at the termination of the famine, supposing that men in both these stages have either not lost or have recovered their physical strength, but at other times piece-work is disadvantageous. The hopelessness of famine-stricken men is one of the chief difficulties to be overcome, and the prospect of contract tasks only depresses them further.

Mr. Lawrence.—In the early stage of the famine, payment by piece-work may be practicable. When distress is imminent, contracts for earthwork on roads, canals, &c., should be given, but the *contractor should be tied down to finish the work within a certain time*, so as to drive them to employ others than the professional diggers; even if a higher rate be paid, this will be a cheaper plan than for Government to start relief works itself.

Mr. Cornwall.—The rate for piece-work is fixed to give a gang the ordinary rates of wages, provided they do the work. Last year no disadvantages were found from it during the short time it was in operation; and with good overseers to see that the work is done properly and to measure it up carefully, the system ought to answer far better than the payment by daily wage. The difficulty is to get trustworthy overseers in sufficient numbers.

Lieutenant-Colonel Chamier.—Payment by piece-work was tried in the early days of relief and was found practicable for the able-bodied gangs only. It is a species of contract and more advantageous to the labourers than to the State, for directly the workmen come to hard ground they stop work.

BENGAL.

BENGAL.

Captain May.—I would not advocate payment to piece-workers for quantity of work done by them at a fixed rate in addition to the daily wages under any conditions, because it is quite unnecessary, and they can earn more than sufficient by piece-work alone, and it would frustrate the object of relief by making it lucrative to the stronger class; but there can be no objection to task-workers on daily subsistence wages receiving any excess in the value of work done by them after measurement over the subsistence allowance.

Mr. Kisch.—The piece-work system is the best of all systems for famine relief purposes, whenever there are large bodies of labourers in need of work do a full day's task. The system of piece-work by village gangs is the best of all piece-work systems. According to this system the people of a village form themselves into one or more gangs under head-gangsmen chosen by themselves, and work together on the piece-work system. The head-gangsman alone is paid. There is no object in anyone giving false returns of the numbers on the work, and there is no necessity to supervise the payment to individuals. When the piece-work system is adopted, the rate of wages should be fixed so that a labourer doing an ordinary Public Works task would earn the full wage as fixed above in the answer to Question 6. If a labourer does more or less than an ordinary full Public Works task, he will earn more or less than the wage fixed as necessary and sufficient.

When, for any cause, the system of piece-work by village gangs cannot be adopted, the next best plan is to employ petty contractors; but, then, careful supervision is necessary to secure that the coolies are paid their wages regularly. Where there are large contractors employed, security must be taken.

Mr. Lowis.—I have already shown how our labourers were paid for work done, according to a fixed scale.

The advantage of the system was that it secured our having none on our works but those really in want of work; it also enabled men to go away at intervals to attend to their fields, and also by working overtime to earn a few extra rupees to pay for seed grain, &c. As long as the subordinate officers employed in measuring up the work are fairly honest, there ought not to be any opening for fraud. I do not consider that it is any disadvantage that, under this system, a labourer can earn, if reasonably diligent, more than a bare subsistence; whatever work he does has been well earned, and Government are no loser.

BOMBAY.

Mr. Hart.—Payment by piece-work is, in my opinion, inapplicable to pure famine relief works, the object of which is to support the greatest number of population at the minimum cost to the State, not to get the most work done at the cheapest rate. Abuse of the system would be sure to creep in, in spite of all ordinary precautions.

General Wilkins.—Piece-work is not generally adapted for famine works. It was found suited only for the gipsy class—the Wudders and Limanis—who hate systematic proceedings.

Payment for piece-work is made to the head of the tribe, with the concurrence of the whole tribe.

The disadvantages of piece-work are, that, excepting with the gipsy tribes, payment for piece-work to the headman would be fatal as respects a due division of the wages. The weaker members would go to the wall.

Its advantages lie in the facility with which parties are managed and paid.

Mr. Norman.—Piece-work is advantageous at the commencement of a famine. It enables the strong and able-bodied labourers to earn more than a bare subsistence rate, and thus lay by something, either for the support of their families or for future emergencies. Work is also done cheaper by this means. The disadvantages of the system are that the weak and infirm cannot earn enough for their support, and therefore, in the height of a famine, when the prices of grain are very high, it would generally be advisable to have recourse to the system of a regular subsistence wage. The Public Works Department have, I believe, no difficulty in introducing task-work on a large scale, but I am not aware what precautions are adopted to prevent abuse.

Mr. Spry.—Payment by piece-work is only practicable on works when the members of a gang have a common interest with each other; a gang consisting of people from one village would have a common interest; so would a Tondu of Lamanis, or a party of Wadars. But if a gang is made up of people, strangers to each other, and having nothing in common, the system would fail, because the idle would at once begin to shirk and the others would have no influence over them to do otherwise. I should think that only in exceptional cases would the system be advantageous.

Mr. Robertson.—Government, as a rule, has been averse to piece-work. I cannot see any disadvantages in the system applied to famine work; on the contrary, I see great advantages, such as decreased expenditure, decreased distress, and a far better out-turn of work for the money expended. The famine wage, as I have already observed, is only just sufficient to support the individual. It is well known that native families hate being separated; a strong bread-winner would prefer to have his aged relatives with him and to support them by his own and his wife's extra labour than to be separated from them.

Upon a fixed task for famine labour being laid down, extra work should be paid for as piece-work. The result, I think, would be a great saving under the head of "Charitable Relief" and under that of "Civil Agency Works." If a man working by piece-work did not support his infirm and aged, then he should be struck off from the piece-work gangs, who should be held to be gangs with special privileges. A careful checking of measurements will be requisite.

What I heard of the piece-work system on the Nira and the railway was very favourable; people were more contented with it, if not too feeble. It facilitates the joining together of strong and weak gangs on the same work. There was no difficulty found in carrying on different rates of piece-work side by side.

Mr. Candy.—To refer again to what is called the "piece-work" system. I do not think there were rates of piece-work for people of different strength. The rates were so much a hundred cubic feet, and they went up or down as the earth was soft or rocky and as the embankment was high or low. The working party might be only a man and his wife, or it might be 20 men and women, under a recognised head of their own choosing. The system resolved itself into one of petty contracts, and one man for each party gave a receipt for the tools supplied. Those who were weak could work in black soil where the bank was only two or three feet high, and so earn a subsistence. The strong could work where the rate was over 1 Re. per 100 feet and so make money. If a man fell sick or met with an accident, it was essential there should be a hospital to take him to, and so arrangements were made accordingly. Under this system the people lived in their pits, which afforded excellent cover from wind, and even shade from the sun, except at midday. They were happier than when living in lines on organised principles. Moreover, the children were near and amused themselves carrying up clods on their heads. In the Government gangs the children were kept from their parents and put in charge of old women, hence constant crying and a line of mothers always running away from work to see what was the matter.

Instead of working from sunrise to sunset with a break at noon, the people worked when they liked and sat down when they liked. I have heard them working and singing at 10 p.m. on a moonlight night.

All this time I was also the magistrate of the railway, and I can speak of the conduct of the people with great praise.

I also had charge of a tract of country, including about 100 villages, which I and those under me visited constantly. The infirm were mostly fed in their own villages, but nearly a thousand were gathered at a large relief camp a few miles off the railway line.

Major Daniell.—On the Dhond Railway, in March, April, and May, I think the task exacted was too hard; the people had got into a poor condition, and when they first came on to the work they were weaker than the executive officers thought. It was a point of honour with the engineer officers to get the work done cheaply as well as quickly. The chief engineer exercised a very close supervision over his subordinates, and demanded a very large out-turn. This was remedied afterwards by having recourse to piece-work; the people, when I saw them on this work, were looking in better condition and more cheerful, and were working with a will. This was even under a severe engineer who had originally overtasked the people. From what I saw then, and what many engineers have told me, I should recommend the piece-work system for the able-bodied, provided there is also a system of task-work on Civil Agency work for the weaker labourers. As to the lame, halt, blind, &c. who came to the relief camps, in ordinary times they are fed by relations and friends, and only when that fountain of charity dries up, they come on our hands; in ordinary years one never sees or hears of them, but in famines they come to the surface and appear in crowds. It would be far better to feed them in their villages, and, I think, that under proper supervision, this could easily be done through the patels. I have great confidence in the patels, and believe they may be generally trusted with sufficient grain to feed the people on the village lists between one visit of an inspector and another. They have great influence and a high position to keep up. The distribution of charity in such villages should be in cooked food, because many of the recipients are unable to cook for themselves. No one but Brahmins would object to food cooked by Hindus. Not many deaths

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came under my observation. The mortuary registration is quite apart from the police; they only record the sudden deaths, or deaths from extraordinary causes. Every village is attached to some police circle, and has to be visited at least once a week.

Mr. Clerke.—I object to piece-work on famine works. It would increase the expenditure very much; many people would come for piece-work wages who are not in severe distress and would not come for a mere subsistence allowance. No doubt it saves trouble to the managing officers, but good workers will earn too much while the weakly would not earn enough. The Patas and other tanks were under me and were entirely on task-work. I had no piece-work gangs. I did not try the experiment of attaching an optional piece-work gang to a relief-work for the object of encouraging the workers who might choose to work harder and earn a little more than the subsistance wage, nor do I think it was necessary. I used to have gangs of about fifty, and the whole gang was cut if they did not complete the task; but after a little time, when they understood the system, there was very little cutting. Those who were on Civil Agency rates we could not cut at all; those on Public Works rates we could cut down to nothing if they did nothing. I think there should be a limit to cutting; a very careful and considerate officer might not need this, but a more careless one might cut too much, and I would prefer that cutting should not be allowed below the Civil Agency rate.

Mr. Whiting.—The plan pursued in 1877 was, in my opinion, the best that could be pursued under the circumstances; the people being weak and unaccustomed to labour, and the establishment unaccustomed to deal with people in this way, that is, to deal with famine labour. But the modified system in 1878 is a better one when the people are stronger and they and the establishment have been trained to the work. The results of the latter system were much better as to cost of labour. In 1877–78, the actual value of the work was Rs. 1,41,000 out of Rs. 3,16,000 expended. In 1878 (April to September) I spent Rs. 1,14,000, of which the actual value was Rs. 94,000. Of this expenditure, over Rs. 37,000 was for canal work exactly similar to that of 1877, and the actual value of out-turn was over Rs. 27,000. The rest of the work was also carried on by relief labourers, such as excavation of foundation, breaking of metal for concerte, and preparation and carriage of materials. Some skilled labour was employed on masonry, but even the masons were in distress when they came. In the latter stage the people were not so badly off, worked more heartily, really intended to work, and had not so many thin children. I did a great deal more for the weak people than during the first stage, fed them often with cooked food for a fortnight to get up their strength, and so on; and this was due partly to my increased experience, partly to having a better doctor, partly to having a larger establishment compared with the number of labourers. I consider a good doctor to be essential to the proper management of a relief work: a good native who knows the people well is better than an English doctor. Those who lived near the work I allowed (in this second stage) to go to their villages; but then they lost some privileges, such as wages on wet days, allowances for children: many of them, however, left their homes and lived in the huts in order to gain these privileges. If any were idle, and could not be made to perform their task, they were not allowed to come on work near their homes, but were sent to another part down the line, and if they submitted to this test and went, we considered it a proof that they were really in want and feeble, and we put them in a lighter class.

The outcome of my experience is that if the work is a really useful one which Government wishes to finish, if the establishment is well trained in the management of famine relief, if the people do not come on in great numbers so as to swamp all organisation, then the best way to treat them would be the system I adopted in the latter stage. I would have the majority and the more able-bodied on a kind of modified piece-work, on which they can earn a little more than a bare subsistence, but cannot be cut down below a minimum, having at the same time a lower class on lighter tasks, or no task at all, earning the Civil Agency wage.

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Mr. Longley.—When laborers consent to form themselves into gangs (either villagewar or familywar) and to receive payment on the outturn of work returned by the *whole* gang, this is practicable.

The advantages are—

(1.) That an inducement is held out to the laborers, who are thereby prevented from wandering.

(2.) That a fair wage is obtained for a fair return of work.

(3.) That members of the same family and their neighbours are kept together so as to ensure mutual assistance in their work.

(4.) That a fair return of work for the outlay is insured and supervision reduced.

(5.) That payment of wages as well as measurement of work is facilitated, as dealing with individual cases is dispensed with.

The disadvantages are—

(1.) That one laborer is taxed or suffers for the laches of another (but this with his consent).

(2.) That Government may have to pay more than sustenance wages (which I understand to be the principle of relief administration) as the payment is regulated by the amount of work turned out.

When the work is large it may be divided into convenient sections to be allotted to each gang. If these sections are marked out and the quantity and nature of work to be done previously determined, there will be little room for fraud.

Mr. H. T. Ross.—After a considerable experience of *piece-work* under different conditions I can conceive no circumstances in which it is not practicable on relief-works. Its advantages are—

(1.) A sure and equivalent return is obtained for the money expended in relief.

(2.) There is no necessity for a large supervising and paying staff, such as is required on gang works, to make the coolies work, and to pay them.

(3.) Time is not wasted in roll-calls or in making individual payments, the head of each piece-work "group" being alone paid.

(4.) There is the maximum security against fraud, for payment is made only on measurements of work done, and measurements are easily checked at any time.

(5.) Fines inflict themselves on a perfectly equitable system instead of being arbitrarily inflicted as they now are on the gang-work system.

(6.) Returns of the numbers of persons working can always be relied on as correct, as nothing could be gained by adding to the true numbers of those who have worked.

(7.) The laborers work with interest in their labor, the unit of labor being a family or voluntarily-constituted group of residents of the same village, who work without any risk of being fined for the shortcomings of strangers arbitrarily ganged with them.

The only disadvantage of piece-work is that it does not meet the cases of isolated individuals who cannot succeed in becoming members of any voluntary-constituted "group" and who do not care to work solitarily at piece-work. But in a general system of relief this drawback is easily remedied by having one "gang work" in each taluk, or even in each division of, say, three taluks, to which such individuals can go or be relegated.

Mr. Oldham.—Payment by piece-work. (1.)—The practicability of this system seems to be only limited by the amount of room which the relief-work affords.

(2.)—Its advantages are—considered purely as a relief measure and apart from its results in the outturn of work—that when the work is apportioned to separate villages and care is taken that all classes of pauper residents in the village are admitted to it, all other forms of relief in that village may cease, or be contracted to a degree which would not be otherwise practicable. If piece-work is given to individuals or to families, apparently the only advantage is in the much larger outturn of work rendered under it. I only advocate it when allotted to villages. A further advantage is that it permits the whole class of troublesome and dishonest gang writers and non-laboring gangsmen to be dispensed with.

(3.)—Under this aspect its disadvantages are more apparent than real. Each individual recipient of relief is not as fully identified as under the nominal-roll and daily task system, and one individual may earn more than is necessary for his support. In the first case control is lost to some degree, and in the second there is an appearance of waste, as the State only wishes to expend the exact amount required for the support of the individual whom famine has made solely dependent upon it.

(4.)—These objections can best be met by a description of the system as it was practised last year in Adoni. The applicants from a village presented themselves and their fitness for admission to a relief-work was decided on. Then to them was assigned a section of piece-work, the price for which was calculated by ascertaining how much it would cost were it done by the daily labor of the applicants, each giving a full outturn of work (according to the Public Works Department rate of the taluk in ordinary year), and being paid each in his several class of adult, non-adult, male and female, according to the scale of daily wages then in force. Once the work was assigned these people came to it just as they liked, some of them absenting themselves for days perhaps. They put forward their own representatives to receive the price for each section in a lump. At the same time gratuitous relief was much contracted in these villages. It was obvious that if any individual earned more than his famine wage the surplus overflowed into a deserving channel.

Mr. Weekes.—The pettiest system of piece-work is that of payment of a cowree or two per each basket of earth carried. This is often a very effective system, but it requires a really honest paymaster, who must also be present all day; of course a check might be applied by having the earth so carried, dressed and measured or the excavation measured, but the contents of the baskets will always vary. The rates of this and all kinds of piece-work can be calculated so as not to give much, if at all, more than what is proposed to give as the total wage for the day; but I am convinced that it is a good system, and that it would be economical in the end to follow the system and to calculate the rate so that the stronger could make a little more than necessary and the weaker enough. This would stimulate the laborers, give them a healthy interest in their work and an incitement to recover strength. Weighed against the losses incurred by payment of labor by the day and the practical impossibility of always exacting a daily task from the light labor or civil agency laborers, any loss by over-payments, I mean payments in excess of subsistence rates, would be, I believe, very small, and it would be not a loss really but it would go to make the strong stronger and fit to go to professional or larger works, and make the weak less so. The disadvantages are that it gives too much to the strong and little to the weak. But on smaller or light labor works all are weak. Practically the weak object to it and it is greedily accepted by the strong. But wherever I have introduced it the effect has been magical in the increase of outturn. Measurements must be made and the sum checked by a trustworthy officer. The old standard argument from abuse must never be listened to. It should be understood that good management is required in all systems, but of course a proper staff is essential. Abuses there will be, but they must be reduced to a minimum. The great and almost inseparable disadvantages of piece-work are that it is very difficult indeed to measure up daily the amount of work done. One remedy I would propose is to measure up weekly, and this would fit in with weekly payments, and the measurements like the payments should be carried out *by the superior officer*, who like the assistant collectors should not be above detail and should measure *themselves*.

Mr. Travers.—I do not think payment by piece-work advisable on relief works; it may at times be practicable in such work as tank digging or channel cutting, but one of the great objections to it is, that all the strongest and best working people would take it, and leave the weaker ones to work by the day; consequently Government would be losers.

Major Ross.—I would have all work on relief works done by the piece: otherwise the cost of relief works compared with normal rates is enormous.

I would divide the laborers into two classes of *physique*, as at present, and would fix a certain quantity of work to be done at a certain fixed rate, of which the engineers would be the proper judges; the quantity to be exacted by the first class should perhaps be a little under normal rates, and that from the second or weakly class to be of course much less, say 50 per cent. below normal rates, as they are at present supposed to be capable of performing, but they should not be paid, as at present, a minimum wage whether they work or not, but strictly according to the amount of work accomplished in accordance with their respective rates.

Major Ross Thompson.—I am unable to imagine any conditions under which piece-work is impracticable or undesirable. It can be worked on the largest and the smallest scale, and I cannot see how any appreciable abuses can arise.

Piece-work* is soon understood and willingly accepted by laborers when the work to be done is within their powers of execution. The officials of the Public Works Department are the best judges of what is possible and what is not without crushing the laborers with overwork. The earthwork may with great advantage be marked out in squares or oblongs so calculated with regard to "lead" and "lift," &c., that the value shall always be one rupee. A man with his family may then be allowed to commence

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* I mean that overseers or other trustworthy men should go about all day on the work, say between 7 A.M. and 5 P.M., with a bag of rupees hung over their shoulders, paying for each unit the moment it is completed. I am not theorising on this subject, but simply recommending what I have *successfully* practised. In the latter end of 1876 I was at Bangalore and a sum of money was placed at my disposal by the Mysore Government for famine relief work. The work undertaken was forming a roadway on two sides of the Ulsoor Tank. When the line of roadway had been marked out, the pits from which the earth for the road was to be brought were also marked out in rupee units. Regular surveys or sketches were made of the various groups of these units, and a sapper corporal or sergeant placed in charge of a certain number. A number of rupees equal to the number of units in his charge was handed to the corporal.

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work on one or more of these units, and he should be paid on the moment and on the spot for every *completed* unit; when the ground has been marked out in this way and a rough sketch plan of it made, with the dimensions correctly entered, there is no confusion, no chance of mistakes. As a man reports the completion of his unit, it is at once inspected, and, if properly completed, paid for on the spot by the overseer or whoever may be in charge. The amount of encouragement and energy which this system imparts must be seen to be realised. The men know that the sooner they finish their unit the sooner they get their rupee and the sooner they can begin to earn another. The sight of the money being paid into the hands of those who have completed their units, paid on the moment of completion, paid on the ground, paid on the spot, gives heart to those whose units are still incomplete. I regard this system as the best possible. The laborers are kept in good heart; the more they work the more they earn, and the Government get the equivalent for their money at the rates decided upon by their own responsible officers in the Public Works Department.

Another of the many advantages of piece-work crops up here. If one of a family or party at work on any units or group of units happens to be *a little* sick, he can afford to take the rest needful for his recovery, as his fellow-laborers are able to maintain him. No case ever came under my observation of their having objected to do so. They allot the work amongst themselves most fairly as a rule. Another advantage in the system is that gangsmen are not required, and "cooly-driving" may be dispensed with. Maistries are only required to assist the overseer in laying out the units on the ground. All the rest the people know it is for their own interests to do for themselves as well and quickly as may be.

Lieut.-Col. Prendergast.—Provided the laborers are in fair condition, piece-work is generally preferable to daily wages. The advantages are, that the people work at what hours and as much as they please; they need not be constantly watched; and they can earn a good living, while the work done is paid for at its ordinary value. I see no disadvantage.

Major Mead.—Piece-work should not be allowed on famine relief works proper where coolies are only to earn a wage supposed to be but little over a bare subsistence. Coolies wishing to earn more than this and willing to do so should be encouraged to go to ordinary works.

Captain Awdry.—Payment by piece-work will prove an economy to Government in establishment and in outturn of work provided that it is only given to be done to able-bodied coolies. The rates for piece-work may be calculated taking the subsistence wage for a man as what he should receive for the piece of work ordinarily turned out by a man in one day. The advantage is that there is much less room for misappropriation of coolies' money by the establishment, as the coolies themselves know exactly, what they have earned, and an officer can check it at any time; the establishment required may also be smaller.

The disadvantages are that (1) coolies who *could* not work may be overworked or get no wages which can be obviated by applying labor tests to the feeble; (2) that Government may have to lay out a little more money per head than they do under the task system, but on the other hand when they do lay out more it will be because more work is *bonâ fide* turned out.

It would be advantageous where there were any large number of able-bodied coolies on any work, were they formed into a gang and told to elect their own gangman, who would receive their wages and disburse them to the coolies. The gangman must be one of the *working men*, and on no account must a Brahmin or other non-worker be admitted as a suitable representative of a gang of work people.

Mr. Hayes.—I believe piece-work can very well be allowed to go on side by side with task-work on a relief work where there is such sufficient room, and I think the peremptory orders stopping it altogether on relief works in Madras were a mistake, as piece-work is calculated to create independence in the labourer. There is no doubt in my mind, from what I saw of the condition of the labourers when only piece-work was in force on any work, that as a means of relief by itself it fails, as the contractors will not employ the people who have fallen into a reduced condition, but I feel certain piece and task-work can very well go on together.

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Colonel Sankey.—*Effect of keeping employed the able-bodied by piece-work.*—Throughout the season of greatest pressure, there were say on an average 28,000 able-bodied thus engaged under the P. W. Department. Of these probably 8,000 men on the *Mulnād* road works were saving about 4 Rs. per mensem each, for a wife, and perhaps two children, in their villages—the small fund probably going also to help out the scanty means of one or two relatives It is not, I think, too much to say that each of these coolies was more or less instrumental in keeping four other persons from looking for charitable support to Government or private individuals. Again, for the remaining 20,000, made up of coolies, their wives, and grown children, they may be credited with each providing for a non-working member of the family, or hanger-on. Thus by keeping open the ordinary public works for the able-bodied, in the proper sense of the term, the numbers actually kept from seeking charitable relief may be estimated as follows:—

Total average number of labourers employed by the P. W. D. -	28,000
Maintained by the 8,000 *Mulnād* and Coorg labourers -	32,000
do. do. by all others	20,000
Total kept from the kitchens -	80,000

In the month of May, when there was little field work to attract the labour, 36,000 were directly employed under the department, and probably at this time over 100,000 of the total population were thus kept out of the kitchens, or from other forms of charitable relief.

No test needed with the piece-work system.—In addition to the distance test, Sir R. Temple was of

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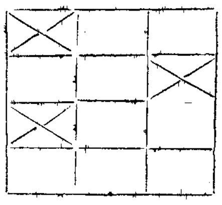
When a unit was completed he marked it with a cross, thus—



and paid for it then and there. The number of unmarked units at the end of the day represented the number of rupees in his possession. The number of crossed units represented the number of rupees he paid away. No other accounts were required or kept by the corporals on the work. The work when carried on under this system can be frequently and easily checked and inspected by the engineer officer. It requires care and judgment in laying out the work, so that each unit shall represent a rupee, but when this has been done all goes smoothly.

opinion that the possession of jewelry by the women, coolies, &c. should be taken as sufficient proof that the applicants were well off, and did not require relief; and possibly under the task system, with its opportunities for malingering and scamping work, it can hardly be denied that some very stringent precautions and close inspection may have appeared necessary. But Lieut.-Col. Johnson, under whose advice the piece-work system was adopted by the Mysore Administration, always held that test of piece-work might well be left to provide for this. It mattered, in fact, little what were the outward signs of prosperity of the applicants, male or female, if they were prepared to work at rates which required them to exercise their strength well, to enable them to gain a sufficient livelihood for themselves and the non-working members of their families. Although the piece-work system should be sufficiently stringent in its terms to prevent its proving a premium on idleness, or as bidding against the planters, cultivating ryots, and other employers of labour, the other extreme should be equally guarded against.

Adjustment of piece-work rates so as to meet the requirements of physique and the market rates.—The chief aim is admittedly to preserve, as long as possible, the normal standard of physique among the working population; but circumstances may occur, as in Mysore, tending to a general lowering of the vital powers from long-continued under-feeling. When such reduction is recognised the piece-work task should be lowered, or, what is the same, the rates ought to be correspondingly raised. About the middle of July it was judged from the reports of the executive engineers, who had been watching most carefully the condition of the people, that the rates might with justice be raised in many cases, if not all round, about 25 per cent., and other arrangements adopted to ensure the people earning full meals, according to the market price of grain, then fluctuating, and rising rapidly. This was tantamount to recognising that the physique of the people was then only 75 per cent. of the normal. A further decrease to even 50 per cent. could similarly and with equal ease have been provided for, and by this means the apprehension entertained by Her Majesty's Secretary of State, that a too-vigilant economy might be made to press with undue severity upon the labourers when so reduced by privation as not to be able to perform a full day's work, might be effectually provided for, and guarded against. The arrangement alluded to was made in a Circular of the 21st July.*

Acknowledged difficulties of segregation.—A most serious difficulty is to find means of providing for persons of widely different physique in one and the same work; but although this presents itself in the task as well as the piece-work systems, it is much easier dealt with under the latter. The experience actually gained will prove this, and is more valuable than any theories.

Mr. Ricketts.—From what has already been said it will be seen that a civilised system of compelling persons receiving relief to work will be difficult of application and consequently the piece-work system has undeniably its advantages as being more rational in form. The advantages of piece-work are that less supervising agency is required; better influences and motives to work are brought into play, and Government gets a better return for its money, whilst the labourer in the same way gets a better return for his work, and which return the labourer is often enabled to divide with others who otherwise might also require Government relief. The disadvantages are that the increased earnings gained by certain individuals go to some extent to lessen the fund appropriated for relief purposes; or, in other words, the money spent on a comparative few would otherwise be available for expenditure on many; further, that it gives an undue advantage to the strong and coarse over the weak and delicate; every strong digger looking out for hardy labourers alone to be his fellow-workers, and consequently sending the feeble to the wall. These remarks apply chiefly to large works. In small civil relief works, especially on tanks, the piece-work system works very well, and in fact might be the rule. Fellow villagers join amicably together, and especially when working in families the strong and weak are mixed in each gang. Where there are particular instances of feeble parties or families the contract rate would have to be lowered so as to enable such people to earn a sufficiency for their proper sustenance. In this system of piece-work the rates would have to be carefully supervised so as on the one hand to prevent some from earning too much and others from earning too little.

As this district is covered with tanks, numbers of which are admirably suited for relief works, the practicability and advisability of piece-work become apparent in its simple earthwork and easy measurements. Even the mere turfing of the slopes of bunds is suitable as piece-work.

Major Moncrieff.—Generally I am averse to payment by the piece on relief work, but I think it is worth a trial, if the work is of such magnitude as to be likely to outlast the famine and of such importance as to make it desirable to finish it. Then I would start piece-work if I found a large portion of the labourers inclined for it, and if they were so I would insist on it for all whom in the last question I have called class 1. The system has no doubt great advantages in simplifying payments, &c., and especially the Mysore system of paying in even rupees for a variable amount of work (24 to 8 C. yards) which is simpler than the North Indian system of paying for a fixed unit of work (1,000 cubic feet) a variable price. A good deal has been said of the value of paying by piece-work in the stimulus it offers to the workman; I have not seen that myself. The disadvantages of the system are—

(1.) It introduces a new element on the work, for it is quite easy to do all by task-work and no piece-work, but with labourers in all stages of weakness and strength, piece-work cannot be carried on alone without task-work. This is additional trouble to the officers concerned.

(2.) It prevents the officer from classifying the labourers as he thinks best. If they are to do piece-work they must be left to classify themselves, and the weakly are sure to be rejected.

Colonel Johnson.—I have already said so much about piece-work that I have little to add in replying to this question. It is practicable on all relief works, but would not be applicable to every description of work carried out on each; as for instance, carrying water, consolidating embankments, and a few other minor items. For these, people should be selected and paid on daily hire. Amongst incapables, too, when the quantity and value of work turned out is small and not of importance, the task system would probably be more convenient.

As explained in para. 23 for piece-work, earthwork is measured before it is commenced, and divided into pits of convenient size, each pit being the unit on which payment is made. A duffadar is placed in charge of every 20 or 30 pits, with a certain quantity of tools, for which he is held responsible. He is also provided with baskets which the coolies buy, the cost being deducted from their earnings, as it is impossible to look after baskets, and the coolies will otherwise exchange new for old, burn them to cook their rice with, &c. On a labourer applying for a pit he allots him one, puts down his name, and the tools he lends him. The man and his people do as much or as little as they like. No one interferes with him or his people, except to see that the spoil is deposited in the right place. When he has completed his pit, he tells the duffadar, who sees that it is the proper depth, &c.,

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* Vide Appendix No. II.

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and allots him another if he wishes for it. About 5 o'clock the subordinate or officer in charge comes round, pays at once in cash for each completed pit, the labourers give up their tools and walk off, or go on with other pits, just as it suits them. There are no rolls, and payment is made to one man or woman instead of to seven or eight.

The advantages of such a system I should suppose must be self-evident to everybody: 1stly. There is no possibility of defrauding the cooly, he knows exactly what he has to do, and what he has to get for each pit. 2ndly. He is perfectly independent, can do as much or as little as he likes; has no duffadar or other person to hustle or drive him, as with test work; there is no object in doing this. 3rdly. His receipts depend upon his own exertions and those of his people. 4thly. He can work when he likes, in the morning or in the evening, and is not obliged to be present at any particular time except to be paid, which moreover he can put off to another day if he likes. 5thly. He can bring all his own people to help or work with whom he likes, and is not obliged to work with people to whom he might reasonably object. 6thly. A spirit of emulation is excited, each party striving to get their pit finished first. Before the kitchens were thrown open, a work (the Durmaboody Tank) was started on these principles, and was most successful. I have never, in the whole of my experience, seen Mysore coolies work in such an enthusiastic manner. The loads the women carried and the pace they went with them excited the astonishment of all that saw them. Contrast this with relief works started afterwards, and no further argument would I think be necessary. 7thly. The principle is so simple that it requires a minimum of establishment. The Durmaboody Tank was supervised by a pensioned sergeant of Artillery who had never been on a work before in his life. The numbers on the work were 4,000 and 5,000, and all the assistance he had was one sub-overseer and a very stupid one too. There are no nominal rolls, pay lists, &c., &c., the accounts being little more than so many pits per diem at so much each. 8thly. The work admits of easy and ready check, the pits are of course all in lines and contiguous, and when a line is completed, a large rectangular pit of even depth is left, a measurement of this does not take a minute, and is at once a sufficient check on the payment made. 9thly. Government get full value for their expenditure, have the satisfaction of knowing that the people are paid according to their deserts, and that there is nothing demoralizing, but, on the contrary, everything elevating in such a system of dispensing charity.

The above are some of the most obvious advantages that may be claimed for the piece-work system; the only disadvantage that can be probably quoted against it is that the whole of the relief work labourers are not able to do the same amount of work, and that rates that would allow of an able-bodied labourer earning ample to support himself would starve a cooly in an enfeebled condition. This is perfectly true so far as it goes, but it applies no more to the piece-work than to any other system. With task-work or payment by daily hire the same disadvantage applies, and the difficulty is, when all are working together, to get the able-bodied to do more than the weakly; the difference is that in the piece-work system he gets paid for what he does, and there is therefore every inducement for him to do his best. In the other systems he is paid the same whether he works or not, and there is no inducement whatever. Under any circumstances, and on all accounts, it appears advisable to segregate the different classes, with small bodies into two, with large bodies, into perhaps three different classes, working clear of one another. The first, the able-bodied, whose out-turn would really be remunerative. The second, those that could only do, say from 50 to 75 per cent. of the full task, but most of whom it would nevertheless be desirable to work on the piece-work system, in order, amongst other reasons, to get them into the way of it. The third, the emaciated and sickly, the only object of bringing whom to a relief camp is apparently to add to its horrors, to make it more revolting and unattractive to the most respectable portion of the community most deserving of relief, and to spread disease and pestilence more widely than it otherwise need be.

The piece-work system is advantageous, and can best be adopted on a large scale in large earth works, such as excavations and embankments; but it is equally applicable to other work, such as collecting, breaking, or spreading stone, digging, or spreading gravel, clearing side or check drains, building stone or brickwork, making mats, baskets, or rope, &c., &c.

The precautions necessary are: 1st. That the officer in charge should know how to work it. A man may be a first-class engineer, but a very poor hand at managing and organizing labour. Our piece-work in ordinary times is done chiefly by petty contract through middle men, and although the principle of working it departmentally is simplicity itself, it is not everyone who knows how to start it, and in such cases a number of needless and objectionable precautions are taken the people do not understand, and that worry and frighten them away from the work. The people can scarcely be left too much to themselves. When the Durmaboody Tank was started some of the most experienced officers prognosticated its failure. It worked without the slightest hitch of any sort or kind from beginning to end, and the man in charge had never had the management of a gang of coolies before in his life. 2ndly. The pit should invariably be marked out over night. Duffadars and tools ready on the spot, so that the coolies are never kept waiting for a pit for an instant. 3rdly. Care must be taken that the pits are excavated to the proper depth, that the spoil is deposited in the proper place, and that it is not thrown down or scattered about on the road. 4thly. Good roads and ramps should be made for the people to go and come upon, and the empties should go back by a different road from the laden coolies. This is necessary on all works, but especially on piece-work, as the coolies thereon will work twice as fast. 5thly. Care should be taken not to pay for pits twice over. The most simple plan of avoiding this is to have a diagram of the pits, and cross or hatch them out as they are paid for. 6thly. The pits should be marked out in zones, as nearly equidistant as possible from where the spoil is to be deposited, so that the rates, which are of course regulated by length of lead and lift, and have to be frequently charged, may be as nearly as possible the same for all. 7thly. In zones of equal rates, the distance being taken from the centre of the zone, the inside pits or those nearest the spoil will of course always have a pull over the outside. A good supervisor will take advantage of this to favour the more weakly by alloting them the inside pits. 8thly. No man should be allotted more than one, or at most two, pits at a time; as soon as he has completed that he can have another. 9thly. By exerting his influence and authority, a good supervisor can materially assist in preventing or settling squabbles amongst the people in the division of their earnings; in fact the coolies will generally accept his allotment. but in this, as in everything else, everything depends upon the tact and judgment of the supervisor. 10thly. It is requisite to have plenty of work ready, for at piece-work the people get through the work very much more rapidly than in any other way. 11thly. The last and most important precaution is that there must be no possibility of the really able-bodied being able to obtain work at easier rates among the 75 per cent. or other classes. If more attractive work is obtainable piece-work must necessarily break down.

It may be asked why, if piece-work is so advantageous in every way, do some engineers consider it inapplicable to relief works? My reply to this is, that under ordinary circumstances piece-work is executed for the engineer by gangs of professional or regular workmen, or through middle men. The works may be measured up and paid for once a week, once a month, perhaps not oftener than once in three months. It must be quite evident that such a system would be

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perfectly inapplicable to relief works and the simple method by which it can be made to dovetail into daily payments has probably never occurred to them. As already stated, when it was proposed to start the work on this principle at the Durmaboody Tank, experienced engineers prognosticated its failure. It not only succeeded perfectly, but other large works were started on the same principle afterwards, and were equally successful, one of them under my orders was under a non-commissioned officer of the Sappers, who had never had independent charge of any work before, and he had no difficulty. The objection that during famine we cannot afford to allow the people to earn more than sufficient to support them I consider much more theoretical than practical. There is very little fear, if the rates are fairly fixed, of the majority doing more works than will suffice to enable them to support themselves; the difficulty is rather to get them to do enough. The cumbersome system, additional establishments, grievous waste of time, adopted to prevent people from getting too fat on relief would, in my opinion, far more than cover the cost of all the fattening that is to be anticipated.

In connection with this question there is also the question of middle men. A very large number of middle men had to be got rid of when public works were stopped, but some were taken on again when permission was given to go on with a few of them. I consider the exclusion of middle men a great mistake; they are obliged to pay the same rates and make their works quite as easy as on the relief works in the neighbourhood, or they would not get a single cooly to work for them. These men not only pay their coolies properly, but give them advances; they understand their work and look after it well. They are a most valuable supplement at all times to the permanent establishment, yet when we had a greater demand on that establishment than at any other time their services were discarded for fear they should make too much out of it.

The abuse of piece-work is prevented by the adoption of fair and proper rates. If the precautions above noted be taken there is no other chance of abuse that I am aware of. No practical man would ever be afraid of people coming to work at proper rates who were not obliged to resort to work to support themselves. As regards actual work, I suppose 10, perhaps 100, times as much money has been thrown away by arrangements calculated to prevent imaginary people resorting to works who did not require relief as would have been done if Public Works officers had been allowed to throw piece-work open to all-comers. The arrangements I allude to are the adoption of other systems of work by which the able-bodied were worked down to the incapable level, instead of an endeavour being made to work the incapable up to the able-bodied level. The establishment and time wasted in raking useless nominal rolls, paying people from a toll, &c., &c.

Question 12.—Housing, Sanitary Arrangements, and Discipline on Relief Works.

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What is the best form of hut for labourers on the relief work, and what the best method of arranging them in a camp? What is the cost of hutting per head? Should the huts be erected by specially-hired labour or by the relief labourers themselves? What points require consideration in selecting a site for such a camp? What sanitary arrangements should be prescribed in it, especially as regards latrines? What establishment is necessary to look after these arrangements? What police or other establishment is necessary to preserve discipline and to prevent robberies? How should this be organised?

Punjab.—9 answers. A summary of these answers is not attempted.

Bengal.—Ditto.

North-Western Provinces.—Ditto.

Bombay.—9 answers.

Madras.—Twenty European gentlemen have replied.

There is, of course, much variety of opinion in regard to the best form of hut, the cost and materials, as much depends on local circumstances, and as to whether the camp is intended to be permanent or movable.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Colvin.—We used no huts except with the inefficient gangs in the rains, and then we had thatched chhappars like an inverted V, 20 to the chhappar. The efficient labourers travelled so fast that a camp would have been very difficult. Dry weather too made hutting unnecessary. In the cold weather the labourers went to the neighbouring groves; in the hot they slept out in the fields.

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Mr. Hewlett.—For the fine-weather months I think the people should be left to hut themselves. They made very good huts with the branches of trees, the interstices being filled in with brambles; but the huts should be laid out in regular line, and not be crowded together. After the experience I have had, the only part which I should alter in the rules I drew up in obedience to the instructions of Government at the commencement of the famine would be as regards the chulas, which, I think, the labourers might be left to make for themselves. They generally made them close to their huts, and they were never a source of danger or inconvenience.

The points requiring consideration in the selection of a camp are stated in the rules.

The arrangements made for field latrines, which answered very well indeed everywhere, are also stated. All that is wanted is that a trench not more than a foot or less than six inches be dug daily, the earth excavated from it being heaped up on one side. There were no sweepers procurable, so I insisted on a long bamboo with a scraper at the end being kept, and the labourers themselves filled in earth after they had performed the offices of nature. There is nothing in this to injure their caste prejudices, and it only required a little firmness in the commencement to establish this practice. The great success of this plan has frequently been observed by me.

The preservation of water supply is all-essential, and a plan introduced by Mr. Burke at Yewti was a capital one. There were about 16,000 labourers collected in two camps, between which a nullah passed. This was the source of water supply. The sand in the dry bed of the nullah was heaped up above and below, so as to form a high wall to prevent cattle straying into it, and in the space between the two walls tanks were dug for the various castes—Mahrattas, Hindus, Mhars, &c. There was a guard kept over the tanks, and the approaches to the nullah were kept scrupulously clean.

The more intelligent of the labourers were made policemen for sanitary purposes, and placed over the water supply, latrines, &c. They were distinguised by a piece of red cloth bound round their arms.

The best way to make an inspection of the labourers is to draw them up in one line in the following order: men, suckling mothers, mothers with children, single women, boys, girls.

The muccadums of gangs and karkoons to attend the inspecting officer. As also a cooly carrying in a basket wooden tickets covered with a distinguishing solour—red, blue, yellow; each ticket to have a piece of string through a hole in the top. The inspecting officer inspects each individual, and those who require special treatment are made to fall out. The inspecting officer to give each a ticket (red) to denote the holder to be taken to hospital as an in-patient, blue as an out-patient, yellow to be fed at the relief kitchen, once, twice, or three times a day, as the case may demand. Each person who requires special treatment to be taken to a selected spot, where his name and other particulars are to be entered.

During the rains other arrangements for hutting the men must be made, and the cheapest form of hut, I think, consists of date matting dammered over. These huts were large enough to hold twenty people, and the sloping sides came down to the ground, which was raised, a trench being dug around with drains to carry off the storm water. The supports were bamboos.

Mr. Hart.—The ordinary separate hut formed by the labourer himself is, I believe, all that is necessary. Rafters, bamboos, and mats or grass should be supplied, and the position of the camp should be settled, in accordance with the instructions of Sanitary Commissioner.

Police furnished from the force, or supernumeraries supplied by the police officers, should be employed, and the organisation carried out by this establishment.

Colonel Jones.—Points in selecting a camp are—

1st. Proximity to good drinking water.
2nd. Not too far from the work upon which the labourers are employed.
3rd. Facilities for obtaining food and fuel.
4th. Facilities for constructing field latrines.
5th. Surface drainage.
6th. That the camp should not be a source of danger to the neighbouring villages in case cholera or other epidemic disease breaks out amongst the people.
7th. Below the source of water supply.
8th. Elevated ground, and not too near nullahs, if available, should be preferred.

The huts should be raised on an earthen platform one foot high, and face north and south in the Deccan. A trench should be cut on each side of the huts for surface drainage. The latrines should be at least 300 yards from the huts, to leeward of the camp, and not near the wells or other sources of water supply. Where the soil admits, trenches not more than 6 inches deep should be excavated daily. For 500 persons two trenches of 100 feet long will be sufficient.

The trenches should be filled in every evening and fresh ones opened the next morning.

Nullahs should never be used as latrines.

The huts should be arranged in rows.

Cost of hutting per head, about a rupee and a half (Rs. 1-8-0), exclusive of cost of carriage to site.

The huts should be set up by the relief labourers.

For about 8,000 people twelve muccadums are sufficient for sanitary purposes.

For large camps a special police guard should be entertained, but for the smaller camps a few chowkedars are sufficient. (*See Diagram opposite.*)

General Wilkins.—The best form of hut is that ordered by Government, which consists of bamboos and bamboo and date matting. Grass was not procurable excepting near the jungles. Palm and teak leaves or other large leaves laid over matting made good roofs. Double layers of bamboo matting, tarred, the layers placed six inches apart, made a good and durable roof in wet weather.

The huts were erected by the people themselves, aided by carpenters specially hired or found amongst the people.

Camp sites should be carefully selected by the officers of the works, and placed on high sloping ground at a distance from any watercourse, which if close at hand is very soon defiled by the people.

The people should be prohibited from cooking in the living huts. Cooking huts should be provided at the end of each line of huts.

Latrines should be to leeward of the camp, and new trenches should be opened almost daily.

No burials should be permitted anywhere near a camp, and the appropriations of nullahs as burying-places should be strictly prohibited.

The camps should be under the care of a headman, who should have an establishment of a muccadum and four village policemen, with a few low-caste people to fill in and dig the latrine trenches.

Huts 30 by 10 feet will accommodate 20 people.

The cost of hutting varied from 12 annas to 2 rupees per head. There was not much hutting in the Southern Division.

The camps should, of course, be under the charge of the officers of the works.

Mr. Spry.—The form of hut for relief labourers must depend entirely on the materials available, and no specific rule can be laid down. During the famine here date branches and date matting were largely used, because grass for thatching was not procurable. The huts can best be erected by the labourers themselves, and at little or no cost, provided materials are procurable. If they have to be brought from a distance, the cost may be great and must vary according to circumstances. The best arrangements for a relief camp are, I think, those laid down by Dr. Hewlett and circulated with Government Resolution Public Works Department No. 237 Civil Works 937, dated 1st December 1876. I think that for every body of 1,000 labourers there should be a police guard of a head constable and six men, and they should belong to the regular Police Force for the district. Temporary men engaged are but little good.

Mr. Moore.—The camp system sketched by Dr. Hewlett is the one which was adopted in this district, and it answered very well.

Mr. Hamilton.—As relief labour seldom goes on in continuous rain, I should let labourers make their own huts, which they soon do by excavating a square room and covering it over with coarse cloths supported by twigs.

Colonel Anderson.—Huts 50 or 60 feet by 13, 10½ feet high at the ridge and 4 feet at the post plates, is a convenient size, with an opening at each end and two on each side. But much depends on the materials available. Cost must similarly vary with locality. Huts should be erected by the work-people; the less able-bodied can do good service in much of this work. Huts should not be too close to one another or many massed in one block. Site of course on hard soil near water, and though elevated not exposed to the force of violent winds; nothing renders a work more un-

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popular. On sanitary and police arrangements leave opinion to specialists.

Mr. Robertson.—The form of hut can be best stated by the officers of the Public Works Department. They might be arranged in echelon on the plan laid down by Dr. Hewlett, but with less space between the rows of huts. A camp on his plan took up far too much room, and was difficult of supervision. The distances between the huts might without any harm be lessened, and then Dr. Hewlett's plan would suit well. The cost per hut must depend on the price of materials at the time. During the famine grass was very dear, and bamboo matting had to be used in many places to save expense. As dry a site as possible, not far from water, should be selected for a camp. Latrine trenches should be dug, and a staff maintained to attend to them. The District Police Force will enrol such extra police as may be necessary, and attend to discipline, &c.

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Mr. Longley.—The best form of hut for laborers in a relief-camp is a simple lean-to in the shape of a Δ 8′ × 8′ built of bamboos tied together at the top, the ends being forced 6 inches into the ground and covered with bamboo matting or palmyra leaves. Each hut will hold a family of five. They should be arranged in rows of ten or twenty huts in a row, according to the number accommodated, each row 20 feet apart and the huts in each row 8 feet apart.

The cost of hutting will be about 5 or 6 annas per head.

The huts should be erected by the relief-laborers themselves, they being supplied with necessary materials.

Position, direction of wind, drainage, and water-supply. The position as a rule should be to the leeward of the relief-work, and, if the nature of the ground will admit of it, the camp should be in a lower level than the water-supply to save the latter from pollution.

Mr. Grose.—I have found a lean-to shed the most economical, and it is as popular as more substantial forms. I found it best in the end to construct sheds after the plan described in Appendix K, under which paupers can be hutted at Rupees 2¼ a head. It is quickest and cheapest to use skilled labor in setting up the huts, and artisans who do this kind of work are seldom driven to relief-works. The site of a laborers' camp should be on high ground near good water and the work, but at some distance from any village.

The police guard must vary with the size of the camp, beginning with a head constable and three constables, which is sufficient for a laborers' camp containing, say, 1,000 men, but more will be required to watch the people at work and the cash chest.

Mr. Crole.—The best form of hut for a working camp is a small lean-to, made of mats or leaves and bamboos or split palmyras; size about six feet square, which is sufficient for a family. The cost of hutting varies, but should, under no circumstances, exceed one rupee per head. The huts should be erected by the coolies themselves. High well-drained ground to leeward of the work should be selected for the site of the lines. Latrines should consist of long shallow trenches, to be gradually filled up as used by the coolies themselves. Police and toty establishments are only required on very large works. They need never be large.

Major Baynes.—The most convenient form of construction is a hut resembling a rowtre; it requires only two upright posts, one ridge-pole, and six rafters which run from the ridge-pole to the ground; three on each side the roofing and end walls should be made in the form of hurdles thatched with the most easily procurable material; these only require to be laid on the frame-work and tied firmly to it. The huts should be fifteen feet by ten feet in area, the ridge-pole should be nine feet above the ground. Such a hut will accommodate six adults and three children and their cooking utensils, &c.; the advantages of making them thus small are facility of construction and removal, of supply of materials, and their suitability to family groups. In the event of its being necessary to shift a camp, the inmates of such a hut can untie it and carry it along with them. The camp-site of each division will have to be sub-divided like the poor-house into separate quarters for caste persons and pariahs' huts. In each sub-division the huts should be placed in rows with intermediate roadway of twenty feet and with only space between each hut sufficient to allow of a foot-wide drain to carry away rainfall from the roofs. If placed further apart, the inmates will commit nuisances between them. Each row of huts should be allotted to a gang. Twelve huts would be required for a gang of 100 persons; of these huts some must be allotted to families, single men, and women.

In close vicinity to this camp an enclosure, with kitchen and day-shed, must be constructed for feeding and lodging the non-working children of workers. To superintend this a gumastah will have to be appointed. The cooks and children-nurses must be selected from some of the female workers of each gang; their number must, of course, vary with that of the children. The total number in each camp should be regulated by the number of gangs allotted to an overseer (see under Question XVII.); this number is assumed to be sixteen. In this way the inmates of the camp form little divisions, each with its own staff of overseer, paymasters, and gangsmen, and can be more easily handled and supervised.

The cost of hutting must depend on local circumstances; my average per head was 8 annas.

The huts should be constructed by contract; this is the best and cheapest agency; certainly not by the relief laborers, because it is most essential to the health and general well-being of the cooly that their hutting should be *ready* for them on arrival. I have a painful remembrance of the confusion and sickness which was the result of massing coolies before shelter was provided for them.

The points to be considered in selecting camp sites are capability of drainage, sloping site, vicinity to wells of drinking water, or feasibility of sinking them, nature of soil, convenient site for latrines, access by cart-road, vicinity to a tank for purposes of ablution, &c.

With regard to latrines and sanitary arrangements the same general principles as those laid down in paragraph XXIII, section II, will of course be applicable also in this case. A good plan for enforcing the use of latrines is to make any member of a camp actually seen committing a nuisance in the camp precincts remove it outside the enclosure and bury it, or fine all the adults of a hut near which excrement is seen six pies each, which should go to the scavenger fund, and also to make any person found committing a nuisance in the vicinity of the camp bury his deposit.

One scavenger to every gang will be required to keep the latrines swept; the area allotted to latrines must be large enough to allow of fresh portions being taken up.

One warder to every gang should be on duty when the camp is occupied by the coolies. Their duties will be similar to those laid down for warders in a poor-house in paragraph 27, section 2, with the exception of obvious details which need not be stated.

When 3,000 coolies are collected the presence of a police guard is, of course, necessary, but their interference with the coolies should be limited to the ordinary duties of a police officer. They would also have to furnish a guard over the cash-chest, and a constable should be on duty at each arrack shop to see that the rules of license are not infringed.

Lieut.-Col. Hasted.—I think that all our people preferred small beehive huts constructed by themselves to any other, description of shed. Our best camps were rows of these huts with good wide streets between them, faced so that the prevailing winds should blow through the streets, and with a drain down each. We selected open ground, with a good fall for drainage, and in the vicinity of good water; the latrines, which were simply screens of wattle, or palmyra leaves round trenches, which were filled in and renewed from time to time, we placed at a little distance on the side from which wind was least to be expected. A police guard of three men should be sufficient for each camp of 1,000 coolies.

Surgeon McNally.—The form and materials of relief laborers' huts must necessarily vary according to the materials available, the climate of the place, and the manner in which the laborers are grouped. In districts where bamboo jungles exist, bamboo matting, plastered with mud or cow-dung and tarred, is a light, cheap, portable, and durable material. It can easily be covered with a thatch of grass or leaves if necessary.

The points requiring attention in the selection of a site for a relief-camp are much the same as for a military encampment. They will be found described in certain military and hygienic text-books. The most essential requisites for a labor-camp site appear to be: (1) sufficient open space freed from brushwood, (2) clean surface, (3) good drainage, (4) good and abundant water, (5) ready supply of food, (6) distance from, or windward of, any unavoidable nuisance or likely source of disease, (7) vicinity of work. Mobility should be regarded in the construction of labor-camps. It may be necessary to move them on account of epidemic disease, fouling of the ground, progress or completion of the work, cessation of distress in the locality, difficulty in obtaining food or water-supplies.

In no case should a camp contain more than 1,000 individuals. At large works separate camps should be constructed for every 500 or 1,000 laborers.

Relief laborers should be employed in the construction of camps and also, as far as possible, in their management.

Two forms of labor-camp suggest themselves—the first consisting of small huts to accommodate families, the second of large sheds to contain gangs. A standard plan suitable to all places and circumstances is scarcely possible, but I consider that the accompanying plan—*mutatis mutandis*—would be a good model for such camps. This rough plan exhibits a suitable *échelon* arrangement for groups of huts or for sheds. Where there is ample ground space, a more extended arrangement would be preferable.

Camp for families.—Taking the average family to consist of five individuals, a camp for 1,000 people would contain 200 huts. These may be conveniently arranged in batches of ten as represented in the plan. Each hut would consist of a light arched framework of split bamboo, strengthened, if necessary, by a stake in centre of arch at each end. This framework should be covered by a single piece of matting, or by several over-lapping pieces, tarred as described. Light detached semi-circular mats might be provided to cover one or both ends, leaving a ventilation space of at least 6 inches below. These huts would resemble Nilgiri Toda huts with open ends. The floor space of each hut should be 13 by 6 feet, and the height in centre of arch 5 feet. Each group of ten huts placed side by side would occupy a platform 60 by 13 feet, raised according to the nature of the soil and the climate. Small drains would be required between the huts; an inch or two off the width of each hut would leave room for them.

Camp for gangs.—It would be difficult to devise a more suitable pattern of shed for camps of this kind than that adopted in poor-houses ("relief-camps") during the recent famine. For a relief-camp, however, where little more than night shelter is required the model need not be so lofty or substantial. The dimensions for a shed to contain a gang of 50 adults should be:—length 75 feet, width 13 feet, height in middle 9 feet and at sides 3½ feet. The floor should be raised according to the nature of the soil and the climate of the place. Puddle, covered with clean sand an inch or two deep, makes a good floor. The eaves of the roof should project at the sides and at each end sufficiently to prevent rain from beating in. The sides may be formed of movable mats, which should be raised in fair weather. For mixed gangs, *i.e.*, gangs containing a certain proportion of men, women, and children, a matting partition could be placed in each shed to separate men from women and children. The first plan of camp with small arched or Λ shaped huts would be preferable, whether for gangs or for families, in all cases where a *movable* camp is required.

Latrines should be of the simplest possible construction. The most suitable would be a simple enclosure of 6-feet matting within which trenches 7 inches wide, 18 deep, and 5 feet apart should be made. The earth dug out of these trenches should be heaped up in the middle of the 5-feet span between them, so that this space might not be defiled. A sufficient quantity of this earth, or of earth kept dry under shelter, should be thrown into the trenches morning and evening. When the accumulation fills them to 6 inches from the surface, they should be completely filled in with earth, and new trenches be dug in the interspaces. When these have been filled in like manner the enclosure should be moved to fresh ground.

A more permanent form of latrine must necessarily be adopted for enclosed poor-houses. Besides the latrines it will be necessary to supply urinals for night use. Earthen pots or tubs, tarred inside and out, are suitable for this purpose. One should be placed near each end of every shed or group of huts. Two scavengers ought to suffice for the conservancy of such a camp.

If a hospital be attached to a camp, or aggregation of camps, it should be quite separate.

MYSORE.

MYSORE.

Major Scott Moncrieff.—In Mysore we found the most popular hut, one adopted from works in the Sholapur District. Its ground area was 9′ × 6, and it was 4½′ high at the ridge. Its frame work consisted of two pairs of light bamboos stuck into the ground 6′ apart, and tied together where they crossed. A fifth bamboo formed ridge pole. The sides consisted each of a bamboo matting 9′ × 5½′. Over the top was bent a third matting overlapping them. A drain was cut all round, and the earth formed a raised floor within. One end of this hut was closed with a mud wall. Each hut was supposed to contain a family. They were placed 2′ apart in regular streets 50′ wide, and in camps containing not more than 600. The labourers themselves should erect the huts, and be paid for doing so, but they will require some men with cleverer fingers than themselves to make them look as tidy as they should. The cost of hutting per head should be about one rupee. This form of hut would not do for

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Mysore.

relief works in the cold weather in Northern India. Something warmer would be necessary. A camp should be near the work, on elevated ground distant from nullahs and ravines, with an abundant supply of good water so situated that the camp should not drain into it. If an open tope of trees is to be had the camp should be placed there. Fuel ought to be procurable. There should be soft ground at hand (best of all a field) for digging latrine trenches. These ought to be 500 feet to leeward of the camp, one for each sex, daily dug in long lines, 1' deep, and daily filled in and fresh ones dug.

A few police must be entertained to enforce the use of these latrines, and a few sweepers, to see that all is kept clean and not a bad smell in the place.

QUESTION 13.—BAZAAR ARRANGEMENTS IN CONNECTION WITH RELIEF WORKS.

Ch. III. Qn. 1

What arrangements do you recommend for a bazaar? Should an arrangement be made with one man to supply the labourers on certain specified terms, or should any traders who wish to do so be permitted to open shops? If the supply of traders is for any cause insufficient, what steps should be taken to induce persons to open shops, or otherwise to provide for the sale of food, &c.? Where should the bazaar be located? Should the huts be erected for the traders at the cost of Government or at their own cost? Should any supervision be exercised over what they sell (for instance, to exclude luxuries or unwholesome food), or over the prices as which they sell? and, if so, in what way? Should they be allowed to keep their shops open all the day or only when the labourers are off work?

Punjab.—Any traders, and they may put up their own shops. If they fail, Government will come in and sell grain.

North-Western Provinces.—Similar to Bombay.

Bengal.—Similar to Punjab.

Bombay.—10 replies. General opinion that all or any traders should be allowed to open shops. That a site should be allotted, and the traders build their own shops. That there should be no interference, except to exclude unwholesome grain and false measures. That the shops should be open all day. Government should not import grain unless it is absolutely wanting, or to put down a conspiracy to raise prices.

Madras.—Fourteen gentlemen (Europeans) have replied.

The general opinion is that in most cases the ordinary local trade and the periodical markets will meet the requirements of the labourers on relief works. Free trade is recommended as a rule, but where the wages of the labourers fluctuate with the price of grain, under what is known as the sliding-scale system, care must be taken that the bazaar men on the works do not avail themselves of the circumstance to run up the prices unduly. The sale of unwholesome food should be prohibited.

NORTH-WESTERN PROVINCES.

North-Western Provinces

Mr. Colvin.—All this must depend on circumstances. None but a simpleton or a secretary would recommend one rule for general application. The supervision exercised was to put a tahsil chaprasi in charge of each shop or group of shops; and hold him responsible for reporting the quality of the flour to the officer in charge of the works. Complaints were loud enough if bad grain was sold. Luxuries we found were not in demand at famine wages.

Mr. Lawrence.—A bazaar attached to a camp is necessary; a monopoly should not be given; any traders who wish should be permitted to open shops. To induce them to do so, huts should be erected for them near the camp, and an allowance be made them to cover extra expenses on condition of their selling at ordinary bazaar rates, which should be daily proclaimed in the camp by touch of drum. At Agra the allowance was one anna per maund of flour or gram sold. A Government official should exercise supervision over the traders to guard against overcharges or sale of bad food; also to see that a sufficient supply of proper food is in stock. For instance, when wet weather comes on he should see that the traders have an ample supply of parched gram, as the paupers will not be able to light fires to cook. It may be left optional to the traders whether they keep their shops open all day. Shops for sale of parched gram should be open at the works all day.

BENGAL.

Bengal.

Colonel Burn.—If private trade and enterprise be considered sufficient, as hereafter I opine it will be, leave the supply to be controlled by the demand. Even if Government are compelled to import grain, I would advocate selling to grain-dealers not all in one place to one man, but if possible to several. There will also, except under very disastrous circumstances, be always grain in the country at the outbreak of a famine. Interfere as little as possible with trade; but where there is no hope of such coming to the front, then Government or the Zemindar who is relieving his tenantry must establish their own grain shops.

Mr. Kirkwood.—Any traders who may wish should be permitted to open shops near the works. If the supply of traders is insufficient Government should provide food and condiments, &c., according to the requirements of the people, at a shop on the works, managed by a paid servant, who should sell at certain fixed rates to the labourers only, and to no others. Where trade is brisk traders should be left to put up their own shops; where it is lethargic and requires some stimulant it would be wise for Government to provide the shops gratis at a suitable spot near the works. I would not subject the traders to any supervision, further than to insist (*a*) that their rates are not higher than those in the country around; (*b*), that their supplies are sufficient, and of the quality and kind required by the labourers. Whenever these conditions may be contravened Government should step in as the trader, in the person of its paid servant, as above suggested. I certainly would not forbid the sale of luxuries. The traders should be allowed to keep their shops open all day. When Government has a shop it should only be open when the labourers are off work.

I. III. Qn. 13.
BOMBAY.

BOMBAY.

Mr. Hewlett.—I should leave the traders to build their own huts on a site selected for them, and they should be made to conform to all sanitary arrangements. I think the greater the competition the cheaper will be the price of grain. A strict supervision should be kept to see that they do not sell unwholesome food. Some sickness was caused until this practice was stopped.

General Wilkins.—The sites of the bazaars on works should be fixed by the officer in charge of works.

Perfect free trade should be permitted, and encouraged; but the shops should be situated in places set apart by the officer. The shops should be placed either near the quarters of the Police, or close to the Government establishments, tool chowkies, carpenters' and blacksmiths' shops.

The grain shops should not be placed in the camp amongst the huts of the work-people. Indeed the traders will not open shops in the lines.

If there is any competition, it will be unnecessary to do more than give the sites to the grain sellers; they will put up their own shops.

The grain sellers and all shopkeepers should be permitted to keep their shops open all day.

Mr. Propert.—In the case of large works I would recommend that traders be allowed to open shops as they choose. If ordinary competition fail to supply sufficient grain, arrangements must be made with specified individuals to sell at a rate to be agreed upon. Unwholesome grain should, I think, be forbidden, although certain poor classes, if prices be at all high, habitually and of their own free will use grain which might be condemned as bad by inspecting officers. Famine, however, begets disease, and in times of scarcity the use of the best possible grain should, in my opinion, be insisted upon by those who draw pay from Government. I would not without due reason insist upon banias' shops being opened or closed at certain hours.

Mr. Norman.—I would interfere as little as possible with traders. Any person who wishes should be allowed to open a shop, and, as a general rule, provided they are allowed to charge their own prices. The only precautions necessary are to take care that no grain positively unfit for food is allowed to be sold. The site of the bazaar should be at some little distance from the camp according to the nature of the ground. Government should provide shelter for the traders if no means are at hand to build huts cheaply and inexpensively. The traders should be allowed to keep their shops open all day if they so desire it. Provided the traders are permitted to charge their own prices, it will not be necessary to offer them any other inducements to open their shops. It may, of course, happen that grain is not procurable, and in that case Government might be compelled to become importers and to pay the labourers in grain. Nothing of the sort occurred during the last famine, nor is it likely to happen in this district, where communications are good, and the village traders, who are chiefly Marwaris, are an enterprising race.

Mr. Spry.—I think that free trade should be allowed to prevail as far as possible. I would let all traders who wished it open shops and would encourage competition.

If from a determined combination amongst grain holders, as occurred in this district in October 1876, or from paucity of supplies, the people cannot get sufficient food, Government must itself import grain, as it is bound to see that the people get that.

A plot of ground should be allotted for a bazaar at a convenient distance from the work or camp. The ground should be regularly marked out, and traders allowed to make their own huts thereon, the only condition being that they do not sell certain specified articles which may be looked upon as luxuries or unwholesome. On the prices charged I would make no restriction, but leave that to free trade, nor would I make any restrictions as to time of sale. Over this bazaar there should be a police guard to keep order, and to protect the traders.

Mr. Charles.—Any traders who wish to do so, should be allowed to open shops, but the official in charge of the camp should have power to turn away any trader found selling rotten grain, or insisting on exorbitant prices.

A supervision should be exercised over the traders to see they do not use short measures, as it is very important the labourers should get full measure.

Luxuries need not be excluded. An occasional relish may do a man's health more good than the extra amount of solid but distasteful food he might have bought. No interference should be allowed with the hours of sale.

Mr. Hamilton.—I never experienced any difficulty about the bazaar, and banias were always ready to come and sell at the current rates. I should lay no restrictions on them except as regards bad grain. Of course the police must look after this matter.

Mr. Percival.—The traders should be left to set up their own shops and manage everything themselves. It may be necessary to provide a site. Supervision is required to prevent the sale of unwholesome food and the use of false measures. This will be provided by the police and the Revenue Department. The shops may be open whenever the people please.

Colonel Anderson.—Would arrange bazaar purely by free trade principles, leaving it open to all traders to sell within fixed hours; they would come freely if fairly and reasonably dealt with. If they did not come, would examine reason assigned, and expect to find the solution of the difficulty. Traders should provide their own accommodation ordinarily; in special cases a small hut or two might be erected for them. Would forbid sale of manifestly unwholesome food on pain of expulsion from camp.

Mr. Robertson.—I recommend as little interference with the bazaar as possible; it should be under control as to its sanitary arrangement and form. The traders will in most cases construct their own huts, but in some places this must be done by famine labour. There should be no interference with prices or with what they sell, except only as regards the quality of grain, no unwholesome grain being permitted to enter the bazaar. If a trader has a monopoly and fixes his prices too high, then the district officers should arrange to introduce a competitor. Of course, if driven to it, Government would be obliged to bring prices down to the market rate by itself selling grain, but Government should interfere only when absolutely driven to this step on any particular work. The traders should certainly be allowed to keep their shops open all day.

MADRAS.

Madras.

Mr. Grose.—There should be free trade so far as possible, but, if there is any difficulty in getting traders to come to the spot, they may be induced to do so by giving them huts, or in some such way, and a great deal of discretion should be allowed to the officer in charge in this respect. They must be restricted to the market price of grain by the assurance that Government will at any moment get grain and sell it at the proper price if they do not. Unwholesome food and intoxicating or narcotic liquors and drugs should be excluded, and the medical officer in the neighbourhood or the officer in charge of the work should see to this. I do not think there should be any restriction as to the time at which the shops may be open.

Mr. J. G. Horsfall.—*Clause II.*—I would permit any traders who wished to do so to open shops.

Clause III.—The fullest information should be given to traders, and full assurance of protection to person and property as well as non-interference with free trade.

Clause IV.—Conveniently near to the huts and to police station when there is one.

Clause V.—I think for the sake of complete control they should be erected at the cost of Government.

Clause VI.—The only supervision needed is that they be kept ordinarily clean, and that the food sold is not unwholesome. Prices should not be interfered with. The medical officer, if there is one attached to the work, should daily inspect bazaars and the commodities sold there to see that they are not unwholesome. If there is no medical officer, this must be done by the officer in charge of the work. Of course intoxicating liquors and drugs should not be allowed.

Clause VIII.—Yes. They should be entirely unfettered.

Mr. Longley.—Where the work is not adjacent to a large bazaar, shedding must be provided for the bazaarmen.

I would not make the supply a monopoly by confining it to one person. I have always found it sufficient to notify the need for a bazaar, and merchants gladly avail themselves of the opportunity to trade.

I do not contemplate the possibility of the supply of traders being insufficient.

The bazaar should be near the work.

Hutting should be provided at cost of Government.

Supervision over the quality of food sold is needful. The medical officer in charge of the work or the European engineer in charge can see to this. There is no need to exercise supervision over the sale of luxuries; such little luxuries as tobacco and betel are *necessities* to some. In matters of diet I would let them choose for themselves so long as the so-called luxuries were not unwholesome. The bazaarmen should be permitted to choose their own prices, the wages to the laborers being regulated with reference thereto.

There will be competition as the market will be thrown open to all, and the prices ruling in petty bazaars at works were not found to be more than a few pies dearer than at the market cusbah.

Shops should be open all day. The coolies generally have some relation or child who will make their purchases and cook their food.

Major Baynes.—As a rule natives do their shopping at the weekly fair or "Santhi"; if there is a market town within a couple of miles of the camp, there will not be any necessity for instituting a market for the coolies. I would not advise entering into any stipulations with the dealers; if they find a sale they will supply grain; if they do not, it is evident that the coolies can procure what they require on more favorable terms elsewhere. The only interference (supposing there is no famine of grain) I would advise is that required to check a combination to demand exorbitant prices, which dealers are always ready to do, because the wage of the coolies must vary with the price of grain, and as the dealers are *indirectly* selling to Government, they run up the price unnecessarily, so that I should not permit any dealer to erect a shop on camp limits, except under the restriction that he sold at Government rates, and if the civil officer found he could procure grain cheaper than at the local prices, he should do so after warning the dealers, and dispose of it as suggested in paragraph 5, Chapter II. Hawkers of parched grain and unripe fruit should not be allowed within the cooly lines. If shops are erected, the provisions exposed for sale should be inspected, and if bad should be destroyed; the shops should be closed from 9 A.M. to 5 P.M. I should have a certain number of licensed arrack shops for the sale of wholesome liquor to be consumed on the premises; limit of quantity to be sold and times of sale would be mentioned in the license. These shops should be under the charge of the police. I think the ability to procure a good glass of spirits is very desirable; a wholesome stimulant taken in time will often check diarrhœa and fever arising from a chill.

MYSORE.

Mysore.

Major Scott Moncrieff.—From my experience the trader does not want much inducement to set up a shop at a camp. Should there be a difficulty about the matter he should be helped by the free carriage of his grain from the next town or even by a small monthly wage. Any trader that likes to come should be allowed to do so, but he should be given to understand that he must obey camp rules. If for instance it has been found that he is selling unwholesome trash, and that the coolies are buying it, the officer in charge should stop it, but this will not happen often. Government should give the traders their huts. Prices should not be interfered with in general, but if it is found that he is taking advantage of his position to charge more than he should, he should be warned to desist or turned out of the camp. This must not be done, however, without full consideration.

Colonel Johnson.—The bazaar arrangements should on no account be entrusted to one man. As a rule, more traders will not apply than it is desirable to accommodate. The amildars can generally be depended upon to send traders if they do not come of themselves. The bazaar should be situated between the pay place and the lines. The bazaars should be erected at cost of Government. The sale of unwholesome food should not be permitted. If they bring it after being properly warned it should be confiscated. The bazaar should be kept open all day.

B.III. Qn. 14.

QUESTION 14.—HOSPITAL ARRANGEMENTS IN CONNECTION WITH RELIEF WORKS.

In what cases should a hospital be attached to a relief work? What system of sanitary inspection of the labourers is desirable? How far should the sick be treated without being sent to hospital? If there is no hospital, what arrangements should be made for those who fall sick? When a hospital is necessary, what should be the shape and material of the sheds, what space should be allowed to each patient, what clothing, bedding, &c., what provision should be made, and what class of people entertained for cooking and nursing? What professional supervision should be provided over the hospital assistant? What authority should be exercised over him by the Public Works Department officer, or the civil officer in charge of the work, if there is one?

Punjab.—A hospital may be opened where the labourers number 1,000 and are hutted on the works, if there is no other hospital within six miles.

North-Western Provinces.—There should be a hospital where a gang of labourers numbers over 100. Details given.

Bengal.—Same as Punjab.

Bombay.—11 answers. A hospital should be attached to every large relief work. The rest of the answers cannot well be summarised.

Madras.—Twenty-two European and 2 Native gentlemen have replied to this question.

The general opinion is that every large work should have a hospital attached.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Dr. Logg.—A hospital should be attached to a relief work whenever a gang of labourers is over 100; it is essentially necessary that the labourers should be inspected by the hospital assistant in charge, at least once a day; in the morning before they go to work would, I think, be the best time, because he could then pick out the sick and weakly, and recommend their being sent into hospital for treatment, or put to some lighter labour, such as sweeping, and keeping the camp clear of rank weeds in the rains. The slighter cases of sickness might be treated out of hospital, but the more serious cases, such as those suffering from diarrhœa, dropsy, &c., which denote failing of the system, should at once be put under treatment in hospital, and given more nourishing diet than the ordinary rations of flour cakes and dall, viz., such as meat, milk, &c., with a certain amount of stimulants, if found to be necessary to support the powers of nature. In the absence of a hospital the sick should, as far as possible, be sent to the nearest dispensary or hospital. When a hospital is necessary, it would, I think, be best to have one long room to accommodate about 20 sick, allowing 50 feet superficial and 1,200 cubic feet space for each patient; the ground on which it is erected should be slightly raised, with a gentle slope towards the side walls. It should have a pent-roof made of grass and bamboo, with the sides and ends of some coarse kind of matting, which in the winter ought to be plastered with mud and cowdung to ensure greater warmth; and for ventilation it should have a door at either end, with a couple of openings for windows in each side wall; both doors and windows to be provided with tât purdahs, to keep out the heat by day and cold by night. The clothing and bedding necessary would depend on the weather; in summer a quantity of dry straw, or a coarse mat, for each patient would suffice for bedding; the clothing for males should consist of either a dhoti or pyjama, and a kurtha, with a sheet to cover with at night, all made of coarse gharra cloth; for females a lehnga, kurta, and sheet; in the damp and uncertain weather of the rains a blanket should be added, and in the winter a common native charpoy and two blankets would, I think, be necessary, everything of course being dependent on the amount of funds available. The cooking and nursing of the sick might easily, I think, be done by the labourers themselves, two or three being detailed for the work from among them, say a kahar, if there be one, to draw and carry water, a Brahmin to cook, and another man to attend on the sick, letting the work they do count as labour for them; and to prevent these berths becoming sinecures, the men so employed might be changed every month or fortnight, at the discretion of the officer in charge of the gang, and the recommendation of the hospital assistant, who should, as a rule, pick out the more weakly men of a gang for this work. If the relief work is any way near the sudder station of a district, the Civil Surgeon should visit it often, and the hospital assistant be placed under his professional supervision; otherwise the Public Works Department officer, or the civil officer in charge of the work, should control the hospital assistant, except in purely professional matters, in which he should be left unfettered.

From want of experience I am unable to give any answers to the remaining questions of this section.

Bengal.

BENGAL.

Mr. Magrath.—Hospitals should, in my opinion, never be attached to relief works. They should form part of the poorhouses, whither those who fall ill should at once be sent from relief works. A few simple medicines should be provided and left with the superior staff for sudden illness, such as colic, fever, &c., and an old charpoy or so would be all that was necessary to keep for transport of sick. The hospitals should be long straw huts, sufficiently wide for people to lie on either side with their feet turned towards the ridge poles, a sufficiently wide lane being left in the middle for passage, about two feet should be left between each patient, the ground should be of beaten earth *leeped* with cowdung and mud. There should be no bed but straw and two blankets for each man. One or two intelligent "kuhars" for the Hindus and a Mussulman for the people of his faith, with about one sweeper to 50 beds, would suffice. If, as was the case in Tirhoot, Mussulmans are few, the nurse can also cook for the Mussulman. The poorhouse cooks will always do the cooking work; and if numbers are generally small, the Hindu nurse can also perform the work of compounder. The hospital assistant must be, of course, under the civil authority, but he need not be under the Public Works Department more than that he should be bound to take any sick person in on requisition from the Public Works official.

The professional supervision must, of course, be that of a European surgeon properly qualified, who will continually visit the poorhouses and inspect the condition of the labourers on the works.

Mr. Kirkwood.—Wherever there is not within about six miles of the works a regular dispensary, or special relief hospital opened to meet the cases which a famine always calls into existence owing to bad and insufficient food, it will be necessary to open a small hospital in the neighbourhood of works. This, again, will not be necessary unless the number of persons employed is 1,000 or more, and they are hutted on the works, instead of returning to their homes of an evening.

I would have the labourers inspected weekly by the native doctor in charge of the hospital, whether that hospital be specially opened for the works, or be one already existing in the neighbourhood. If the labourers are within easy access of their homes and are consequently not hutted on the works, I do not think any hospital or regular medical inspection necessary; though every medical officer passing the works at any time should make a short halt and correct any insanitary conditions, or look to any cases which the gangsmen or the overseer may bring to his notice. The medical reports should in all cases be despatched at once to the civil officer within whose charge the work may be situated. If such reports tend to show a want of improvement or a falling off in the condition of labourers, or the existence of any epidemic, a superior medical officer should be requested to visit the works and report. His recommendations as to an increase of wage, &c. should be at once acted on, unless sanction from some higher authority be necessary, when that sanction should be at once applied for.

BOMBAY.

Mr. Hewlett.—I think a hospital and a kitchen should be attached to relief works in all cases. All labourers on coming to the works should be inspected by the medical subordinates. At all large relief works (5,000 and upwards) there should be an assistant surgeon.

The whole gang of labourers should be inspected once a week. This may either be done on Sundays or as the executive officer in charge finds most convenient. I do not think the question is what material should be used for a hospital, but rather what material is available. In the relief hospital I had put up at Sholapur in September 1877, each hut consisted of grass tatties supported by jungle wood uprights and cross-beams, and 100 feet long by 20 feet broad, and was intended to accommodate 50 patients. A superficial area of 40 feet was consequently allotted to each patient, but the sick were so numerous that the sheds were at times overcrowded. Each patient had a cot and a piece of date matting and a cumblie allowed him, but this was an exceptional case to meet a great emergency.

In relief camps where there are not many sick, I think a hut of the dimensions as above given would suffice, and a few cumblies, say 25, might be kept in stock. This number could be augmented as occasion demanded, but the patients for the most part bring their own cumblies. Very good beds were made of clean kurbee, but for bad cases country cots should be procured; but this will add to the cost.

The patients were attended by their caste fellows and by the hospital establishment, but one man should be told off as cook. The Sanitary Commissioner and the Deputy Sanitary Commissioners exercised professional authority over the hospital assistant, but, of course, he should obey all orders given him by the officer in charge of the work.

General Wilkins.—A hospital should be established on every large work. With scattered works there should be a central hospital.

A hospital assistant should be attached to every large work with a hospital. The labourers should be inspected every morning by the hospital assistant in view to the elimination of all persons suffering from infectious diseases, and for the relegation of the sick to hospital treatment. The officer will also make his inspections.

The hospitals should be constructed of the same materials as the huts, and the hospital huts of the infectious patients should be destroyed and renewed from time to time. The patients should have room to move about in the hospitals without inconveniencing each other. As such temporary dwellings are from their nature in a measure self-ventilating, a specific area is not needed for each patient.

The patients should be supplied in hospital with cots, and all things necessary for their recovery. Cooking and nursing should be performed by people selected from the alms-house, which should be an adjunct to all large works and hospitals.

The hospital assistant should be under the orders of the officer in charge of the works.

Mr. Propert.—On every work containing more than 200 people some sort of arrangement should be made for a hospital. A mere medical apprentice is better than no officer at all, and the expense of a small shed and a supply of ordinary medicines will not be found heavy. Details of this question will be given by the Medical Department. If a civil officer be in charge of the relief work, the hospital assistant should be supervised by him. In all cases relieve Public Works officers as far as possible from all duties not strictly pertaining to their department.

Mr. Norman.—If possible, a hospital should be attached to every relief work. Labourers, on first arriving at a work, should be inspected by the medical officer, to see if any are suffering from infectious diseases. As a rule, all the sick should be treated in hospital. Where there is no hospital, the police may be entrusted with simple remedies for cholera and fever, and those seriously ill must be sent to the nearest hospital or dispensary. The Sanitary Department must arrange for the general supervision of hospitals attached to relief camps. Occasionally, a dharamshala may be used as a hospital, and where no building is available, chappered huts should be put up, about 13 feet × 15 feet. The castes should be separated as much as possible, and nurses and cooks told off from the labour gangs. The Medical Department should be asked to state the accommodation and clothes required for each patient. The officer in charge of a work can exercise little control over a medical officer in charge of a camp hospital, beyond seeing that everything is kept in order, that proper accounts are kept of stores expended, and that persons are not allowed to remain in hospital unnecessarily.

Mr. Spry.—I think a hospital should in every possible case be attached to a relief work, and that can be done if large works are opened instead of numerous petty ones. The sanitary inspection of the labourers should be made daily by the medical staff not only visiting the people on the works, but the relief camp, in order to find out any cases which have not been brought to the hospital. These inspections of the labourers, &c. would be co-existent with sanitary inspection.

H. III. Qn. 14.

BOMBAY.

If a man is not well enough to go to work he should be made to go to hospital, otherwise malingering will be resorted to.

If there is no hospital the medical attendant can only treat patients as best he can, but a hospital there should be. Where works are not likely to be kept open for some time, or where the scene of operations shifts about, as in the case of railway or road works, tents are best suited for hospitals, as being portable. Otherwise they must be made of whatever materials are available. Long thatched sheds with mud walls, and placed so that the prevailing winds can blow through them, have answered well here; separate sheds being devoted to different diseases and to men and women. Common charpoys and "cumblis" should be placed in the sheds for the use of the patients.

The cooking should be done by specially hired persons, the establishment varying with the number of patients. It does not generally answer to employ as cooks the ordinary applicants for relief. As to warders and nurses, they can be selected from out of the most intelligent of the labourers, and paid at the same rates. The arrangements should generally be precisely similar to those in a poorhouse.

If obtainable, assistant surgeons and apothecaries, each in charge of a certain number of works or sections of works, should professionally supervise the hospital assistants.

The officer in charge of the work, whether he be a Public Works Department officer or a civil officer, should certainly have control over the hospital assistant to see that he attends to his duties properly. At present nothing short of the Deputy Surgeon General appears to be able to touch this class of men, and consequently they are often careless and perfunctory in the way they do their work.

Mr. Moore.—I think a hospital should be attached to all large works. The medical officer, the police, and the officer in charge of the work should go round and through the camp daily and inspect any sick people and send them to hospital if necessary. I would not treat any sick out of hospital. If there is no hospital, the sick should be treated in their own huts with ordinary medicine, a supply of which should be at hand; if there are any bad cases they should be sent to the nearest dispensary. The rest of this question must be answered by the Medical Department except the last, to which I reply that the hospital assistant should be entirely under the orders of the officer in charge of the work, except as regards the professional treatment of cases.

Mr. Percival.—There should always be a hospital attached to a relief work. The hospital assistant should be responsible to his own Department and not be under the authority of the Public Works or Civil officers.

Colonel Anderson.—A hospital in all cases of large works with large bodies collected. All the gangs should be inspected at least weekly. Sickly and weakly might be given light work in the camp, of which there would always be some to be done. Hospital huts should be similar to other huts, with double space allowed to each person. The hospital assistant should be under the professional supervision of the surgeon of the circle, but entirely under the authority of the chief officer of the work.

Mr. Robertson.—A hospital should be attached to all large relief works. The officer in charge of the work should daily, with the medical officer, muster in lines as many of the labourers as possible for sanitary inspection.

The question as to how far the sick should be treated without being sent to hospital is one for the exercise of his discretion by the medical officer. It would be absurd to attempt to pass any rules on such a point. When a labourer is sick, and there is no hospital and his case requires medical aid, he should be sent to the nearest relief house or camp, at all of which there are medical attendants.

The medical attendant should be subordinate, that is, an assistant, for medical duties, to the officer in charge of the work.

Mr. Bosanquet.—It was always an object here to get a medical officer for every work. The appointment of such officers must depend upon the supply, for there can be no doubt of the desirability, or I should say the necessity, of such officers being at every large work. Here we find an additional argument for large works, as the fewer works there are the more easy is it to ensure proper medical supervision on each. I believe the medical arrangements on the Gokak Canal were everything that could be desired. It is not therefore necessary for me to say more on this subject, as those who are so much acquainted with them can give all these details.

MADRAS.

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Mr. Longley.—Every large work should have a hospital.

Sick coolies can generally be trusted to fall out of the ranks themselves. The establishment on the works are only too ready to turn the feeble out of the working gangs. I do not think it likely that on a large work persons who ought to be in hospital will be retained in the effective gangs, but the medical and engineer officers in charge should make it their duty to look out for such cases and weed them out for medical treatment.

Major Baynes.—On all works of Class I there must be an hospital under the charge of a medical officer of experience; he will require at least two dispensers and a store-keeper through whom he will procure local supplies in the same manner as a poorhouse medical officer. The hospital and the necessary arrangements for its efficiency should be organised before coolies are collected in masses. I have seen the disastrous result of delay in this matter.

All new arrivals should be at once taken to the medical officer; if they are in health, he will write "fit" on their tickets, and then return them with the tickets to the registering clerk to be told off to a gang; if he considers them unfit, he will detain them for such treatment as he may consider proper; those who subsequently become fit for work, he will send to the clerk; those whom he considers to be permanently unfit for employment on Class I he will report to the relief officer for transfer to Class II, or to gratuitous lists; but if the coolies have been properly selected by the relief officers, these latter cases should be few. Every cooly should be inspected once a week after his arrival; this inspection is best done on the spot when the gangs are at work; the medical officer should fix certain days for the inspection of certain gangs, and on such days they should fall in by ranks of men, women, children, as soon as he arrives at the gang next to them. In this way a very large number can be inspected in a short time.

The shape and material of hospital space for each patient being purely professional questions, I do not attempt to offer an opinion upon them, but I would offer some general remarks which bear on them.

Persons who only require simple treatment should be treated as out-patients, and should receive their pay as usual from the paymaster on the medical officer's certificate of their being under treatment;—this indulgence I would limit to three days; those detained as in-patients would not draw pay, and would be struck off the nominal rolls. All cases of chronic

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illness should not be detained in hospital, but sent to the relief officer for disposal.

As professional supervision would be rarely obtainable, the medical officer should be a thoroughly experienced man, capable of acting on an emergency; he should be thoroughly conversant with the vernacular of the district. The only professional supervision that can be locally obtained, unless special provision be made, would consist of an occasional visit from the Zillah surgeon, which would be practically useless from its infrequency. I would suggest the appointment to each district of a special medical officer, whose services would be devoted to constant inspection of camps and poor-houses.

Moreover, as he travelled along the roads the laborers of Class II could be drawn up for inspection on notice being given of his visit.

On all special works of Class I, where more than 3,000 coolies are congregated, I consider the presence of a civil officer indispensable for the proper conduct of sanitary arrangements, supply of food, maintenance of hutting, and distribution of pay, and transfer of coolies to other works or to the gratuitous list; at all events such a work should be visited at least once a week by the relief officer. I should, therefore, place the hospital assistant or medical officer in charge of the camp hospital under his immediate orders in all matters not purely professional.

Surgeon McNally.—A hospital should be provided for every considerable relief-work whenever there is no municipal or local fund dispensary within a reasonable distance, say fifteen miles. It is easier, less expensive, and more effective to utilize existing hospitals, increasing their accommodation and establishments to the necessary extent, than to start new institutions, especially at a time when there is certain to be a great strain on the medical department.

The sanitary inspection of laborers might well be entrusted to select and reliable medical subordinates furnished with clear instructions. One medical subordinate for every 10,000 or 15,000 laborers would be sufficient in ordinary cases. He should inspect them all at least once a month and report on their condition, as well as bring to notice any sanitary defects in relief camps, poor-houses, and villages, and any irregularities or deficiencies in relief administration which he might observe within his circuit. He should also report on the state and quality of food and water supplies. A portable stock of made-up medicines, for distribution to the sick during his rounds, should be furnished to him. Civil or Zillah surgeons, or else specially-appointed medical officers, should inspect and control the work of these subordinates and collect their observations, which should be forwarded with periodical reports of their own to the sanitary commissioner or to Government.

When no hospital is attached to a relief-work, the superintendent of the work should be furnished with a stock of useful remedies for common complaints and simple directions for their employment. Standard formulæ for such medicines and brief medical and surgical directions to accompany them should be laid down. Cases of illness or accident which appear to be serious should always be sent to the nearest hospital with the least possible delay.

The shape and material of hospital sheds must necessarily vary with local circumstances. There could be no better roofing material than tarred matting covered with thatch. The eaves should project at the ends and sides to prevent the entrance of rain or sunshine, and the side walls should be formed of movable mats with a ventilation space of about a foot between them and the roof. The roof should be 11 feet high in the middle and 5 feet at the sides, and the floor should be 14 feet wide. A superficies of 56 square feet and a space of about 400 cubic feet per head is taken to be sufficient with free ventilation.

Quarters for the medical subordinate should be close to the hospital. The necessary establishment for a hospital for forty patients would be two ward coolies (male and female), one caste-cook, and one sweeper. The ward coolies should sleep by turns in the dispensary to attend to the wants of patients during the night and call the medical subordinate when necessary. For the majority of patients a date-leaf or other mat, with straw or sand under it, and a cumbly would be sufficient bedding.

A single fixed diet would be more convenient than a scale of diets for a small hospital of this kind, but the medical subordinate in charge should have power to order *extras* as required for individual patients. The diets might be provided by contract with the cook or other person. The inspecting medical officer of the district or division should supervise and report upon the state of such hospitals from time to time.

The Department of Public Works or civil officer in charge of a work should possess direct authority over the medical subordinate. He should, however, be held responsible for any orders he might issue to the latter, and be requested to give all such orders in writing when possible. Cases of misconduct on the part of the medical subordinate should be immediately referred to the Zillah surgeon or other inspecting medical officer, who should have power to reprimand, fine, or suspend him, reporting the matter to the surgeon-general.

MYSORE.

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Major Moncrieff.—Wherever there is much sickness and a hospital assistant available, establish a hospital, but usually speaking hospital assistants are not very abundant, so it may be convenient to have no hospitals for less than 50 patients, and to bring the seriously ill from outlying works to these hospitals. Hospital accommodation should generally be provided for about 8 to 10 per cent. of the whole workpeople.

If there is no hospital, a native dresser or pundit may be entertained and the officer in charge have a few simple medicines to give the sick.

A hospital should be a good air-tight hut, 15′ wide inside and not more than 88′ long. This allows room for two rows of patients, 25 on each side, and a 3′ passage up the middle. Each patient will then have 21 square feet exclusive passage. For children 15 square feet is ample. The walls may be of mud 4. high. The roof of thatch-ventilation is easily managed along the eves. If the ground is damp and they are easily got, it is best to give the patients beds, the light bamboo and rope *charpoy* of Northern India is about the best bed for them. Elsewhere they should sleep on raised earthern platforms each 6′ × 2½′ and 8″ high, with 1 foot between each. The inside walls of the hut and the side of these platforms should be periodically whitewashed. The floor should be spread with clean sand, unless there is a complaint of fleas, when it is best to have it regularly plastered with mud and cow dung. The bedding and clothing must depend on the climate and the disease. A good warm blanket for each patient should be enough. The usual high caste cooks should be entertained, but convalescents can be employed with good effect in and about the kitchens. Respectable Eurasian women make very good nurses. The best I have ever seen, however, were nuns, of the Church of Rome. If possible a medical officer should inspect each hospital at least once a month. The officer in charge of the work, or the civil officer, should visit it daily and exercise authority as to all questions of sanitation and other matters wanting attention and sound sense rather than medical knowledge.

QUESTION 15.—RELIEF WORKS. ADMISSION, CLASSIFICATION, AND PAYMENT OF APPLICANTS.

What system do you recommend for the admission of applicants for relief on works for securing that no hindrances are placed in the way of their coming, and no bribes taken for admission? How would you provide for classifying them and placing them on gangs? If payment is not made daily, how would you arrange for their receiving advances till the first wage-day comes round? And, if paid daily, what pay should be given to those who come on during the day and work for a broken period?

Punjab.—Civil officers, with aid of committee, to admit applicants, who should be classed by physique and villages. No advances needed.

North-Western Provinces.—Applicants from the same village should be ganged together. New comers should be paid daily for a few days.

Bengal.—The piece-work system is recommended as a security against bribery. The applicants should be ganged at once. Advances are seldom necessary.

Bombay.—12 answers. Applicants should come with orders of admission from authorised officers. They should be inspected, classified, and ganged morning and evening by the officers in charge of works. They should have advances of pay when needful from the cashier.

Madras.—Nineteen gentlemen (Europeans) have replied to this question.

Applicants should be sent to works by the civil officers of districts with nominal rolls, and be received on the works by the officers in charge, and then inspected and classified by the medical and engineer officers. At the height of famine they should also be received on the works direct.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—Civil officers, with the aid of a few members of the Relief Committee, will admit people into the relief works. They will be classed according to their physique and capability for work, and provided with tickets of the class to which they will belong. Care should be taken that the people of one village are kept together and in one place. If proper care is taken, there will be no fear of any hindrance being placed in the way of their coming, or any bribe taken for their admission. No advance should be made to workmen. Persons presenting themselves after 10 o'clock in the morning will receive a half day's wage, and before 10 o'clock full wage.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Captain Marshall.—No system can secure these results except close and frequent personal inspection of the works by the officers in charge. I would let the labourers form themselves into gangs by families and villages.

For the first day I would pay in full, but not again after that to the same man. Such payments not represented by their equivalent in work should be paid by a specially appointed officer, and not mixed up with the regular payments; the regular payments being made on work done only.

Mr. Sheldon.—New-comers should be paid daily for two or three days, and their wages should be in proportion to the time they work.

Mr. Sandys.—The officer in charge should be required to give work to all applicants who come there, or are sent by the Collector, or from the poorhouse.

No complaints of taking bribes for admission have been preferred in this district.

As far as possible those coming from the same village and members of the same family are placed in the same gang, the inefficient being separated from the efficient.

Daily payments have been made in this district.

As a rule the labourers come from a distance, and so a full day's wage is given, although the work done may be only for a broken period.

Mr. Lawrence.—Without some system of bodily marking the prevention of fraud is impossible. The best plan is to paint one of the nails of the fingers with a solution of caustic (60 grains to an ounce of water).* This plan is not objectionable to native feelings. All this may be done by a distinctive system of marking on the different finger nails. Besides this nail mark, the labourer should get from the officer who looks after admissions, a ticket coloured according to rate of payment to be received.

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* The canal authority at Shikohabad told me that the Agra despatches thus marked were proud of the distinction.

BENGAL.

BENGAL.

Mr. Kirkwood.—Works should be easily accessible. The "distance test" is a most decided hindrance to deserving people wishing to come on to the works. The piece-work system is free of anything like a hindrance. Constant supervision and constant telling the people that they are on no account to give anything to anyone, together with an insistence on the piece-work system, whereby remuneration is only acquired in proportion to the labour expended, will have the desired effect of preventing a giving of bribes. The people are too many and too thick on the works as a rule for anything large in the way of taking of bribes to be done under the piece-work system. The fraud there is generally that of the overseer against the people, and in any such fraud they are not likely to be consenting parties. Their earnings being the direct result of their own labour, they are not likely to offer bribes to enable them to receive what they have earned. Under the daily-wage system it would be different. There bribes may be given for participation in a remuneration not earned and a combination entered into by both labourer and supervisor to defraud Government, each taking their share. Nothing but constant and vigilant supervision will hold in check that tendency. Persons on coming to a work, if eligible applicants for that work, should be taken to the overseer, who should at once distribute them under one or more of the gangsmen, who will distribute them among the sub-gangs, or form new sub-gangs of them, as the overseer may after due inquiry direct. He should do this so far as possible in accordance with their castes, villages, friends, and relatives; and too many very weakly persons should not be allowed in each gang. They should be distributed amongst the stronger gangs. Persons discharged from poor-houses or hospitals should be sent on to the works in charge of a poor-house chaprasee, who should have a list of their names and abodes, which he should hand over to the overseer, who would place them in suitable sub-gangs. Except in these latter cases, I do not think that, under the piece-work system, any advance of payment is necessary. I have not found it so. It may, however, here and there be so, and in that case at the end of the first day, no matter at what time in the day the person arrives on the works, a wage of the value of one pound of food may be given. This should be an advance to be subsequently deducted. In the case of daily-wage works, by which I mean works where the wage is paid for attendance on the works and not for work done, if the wage is not distributed daily, but every other or every third day, those coming freshly on to the works on a day when the distribution does not take place should be pointed out by the gangsmen to the ticket distributor when he is going over the works; and, in addition to the ticket then given, the ticket distributor should enter the names of all such persons on a slip of paper, and direct them to be present at evening-time at the pay office. He should himself attend at the pay office with his list at evening-time, and should then direct the pay officer to give a certain allowance (sufficient for support up to the regular pay day) to each of such persons, and should certify on the list that that amount has been given. This slip would then be filed by the pay officer as his voucher. The disbursement thus made should be separately shown in the accounts. But in the case of poor-house and hospital recoveries, or of very emaciated persons sent on to works where the piece-work system is in force, a supply of cash (or food) should be given daily for the first week—perhaps 8 annas in all—while strength is being gained. A separate account of these charitable disbursements must be kept by the overseer in charge, and inspecting officers should closely scrutinize that account.

I would have no wearing of tickets or badges by the labourers on the works. The notion of being thus labelled is very distasteful to the people, and tends to keep away many deserving of relief.

BOMBAY.

Bombay.

Mr. Hewlett.—Applicants should, on being inspected by the officer, be either put into a weakly gang or placed either on medium or full work, as their appearance might render advisable.

I would beg to insist on the urgent necessity for daily payments being made to all weakly gangs. The care taken by Mr. Wingate in seeing to this matter was attended with the best results.

General Wilkins.—Applicants for relief on works should be required to produce orders from the civil officers of the district. The passes should state the name of the applicant and that of his village, in order that the distance test may be duly enforced.

The civil officers should make their arrangements that no bribes are enforced from the people when claiming admittance.

Applicants for work should be kept in gangs for the first week and be paid daily if necessary.

A day's work should only be divided into two parts—half a day the smallest broken period. Applicants before noon to receive a day's wages; applicants after noon half a day's wages.

Mr. Propert.—If a civil officer be present, applicants should be admitted to works by him and classified by him in consultation with the medical subordinate. Bribes cannot be prevented by any fixed rules. In the case of new-comers in a state of destitution, advances must be made, and *not fully retrenched, i.e.* a trifle should be given from discretionary allowance as a gift. This in my opinion should be granted by the civil officer in charge of the work, but if it be found impossible for the civil officer to keep a treasure-chest, then he should be in a position to issue orders for payment on the disbursing officer of the Public Works Department. Broken periods must not be treated too strictly in the case of relief works. Pay a man either a whole day's pay, a half day's pay, or nothing at all.

Mr. Norman.—All applicants for relief should be inspected and passed on to the work by the civil officer attached to the work. When no civil officer is available, this duty must be performed by the officer in charge. Those who arrive too late for inspection must be kept at a relief camp in the rear of the works for one night, where they should be provided with a meal of cooked food. Bribes for admission to works will not be given if it is found that the officer in charge is in the habit of moving actively about the works, and that he listens to and investigates all complaints. The gang should be made up, as much as possible, of persons from the same village or district. Families should not be broken up. A muccadum or headman, selected for his intelligence, should be placed over each gang, and a muster karkun attached to every 200 or 300 labourers. Payment should be made weekly, and, when necessary, advances given in the shape of tickets on the grain dealers at the rate of a pound of grain per adult male, for each day's work performed. Those who work for only a part of a day and leave of their own accord, should forfeit the day's pay. Those who arrive too late for morning inspection must be fed for one day on cooked food.

Mr. Spry.—If the admission of applicants is left to underlings, abuses will soon crop up. Every morning and evening applicants should be required to assemble at a particular place, say the office of the officers in charge of the work. These officers should then inspect, classify, and tell the applicants off into gangs, and then and there have the rolls made out.

In cases where advances of pay are required, these should only be given by the cashier, when the sanction of the officer in charge has been obtained, and a separate register should be kept of these payments These payments should be made publicly in front o the office.

Mr. Charles.—No system that could be devised wil prevent hindrances being placed in the way of applicants for relief and bribes being taken from them by mustering karkoons. Even if a European were to accompany the new hands and see their names written in the registers, the people themselves, through fear of being reported for laziness, or being bullied by the karkoon in one way or another, would be sure to pay up the usual fees.

A common device of the karkoons is not to enter the names on the new rolls (when the first have been filled up) unless they are "squared." No proof is ever possible of these cases. Ten to one no words pass on the subject between the karkoon and the people concerned, yet both understand perfectly well what is necessary. Any complaint that the people make is attributed by the karkoon to his zeal in making them work harder than they like, and there is always proof available that this explanation is too probable to be altogether disbelieved.

The best system of admission seems the pass system, *i.e.* for a civil officer to be stationed near each large

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work and to issue daily passes signed by himself to applicants. Any complaints can be inquired into by him on the spot, and though the karkoons may not be punished for want of proof, still immediate inquiry prevents any long-continued hindrance being put in the way of applicants.

I do not think that in any work, however well managed, exactions by karkoons and makadams can be entirely put a stop to; all that can be done is to prevent extremes of exaction and open misconduct.

Mr. Moore.—All applicants for labour should be admitted by a responsible and trustworthy officer, who should give them a pass on to the work, and register their names. The medical officer should be associated with the officer above mentioned, and the pass should state whether the applicant is fit for ordinary or light work, and in cases of civil works the civil officer, and in the case of large works the Public Works Department should divide them into gangs by villages as much as possible. Starving people must have the means of buying food placed at their disposal as early as possible, and if wages are not paid daily, I would on first admission, and till pay day comes round, pay them every other day. A little food is better than none, and the people should make the best shift they can on half allowance till the regular pay day arrives. After that, they should wait till the next pay day. I do not approve of this principle, but it cannot be avoided. Daily or bi-weekly payments should be made. If daily payments are made, I would pay broken periods in proportion to the time worked, but it would be no great hardship to make people who come late wait till next day for admission.

Mr. Percival.—Labourers should be admitted to the work on the order of the district or taluka officers and of any persons authorised by the Collector to send them. When so sent they must on no account be refused, and without that order they must not be received. The Public Works officer will settle what work they are to do. They should be paid the minimum wage for the first day, however short, and daily wage for a fortnight, after which wages may be paid weekly with advantage.

Colonel Anderson.—Due admission must depend on the activity of the officer in charge of the work and his immediate subordinates to check rascality on the part of their inferiors, as also the classification and placing in gangs. The payment of advances would ordinarily lead to difficulty; it seems a matter which must be left to the discretion and arrangement of the head of the work, who might be able to secure small advances through headmen of gangs. Payments for broken periods of a day would be next to impossible.

Mr. Robertson.—The system adopted during the famine was that all applicants for relief were examined, either by the European officer in famine charge of the taluka, or by the relief mamlatdar, or in some cases by special committees serving gratuitously (composed often of some members of a municipality and the sub-judge). Inquiries were made into their circumstances, and if deemed fit objects for State aid, a dakhla or ticket of admission to a certain work was granted.

Everyone knew well enough where he had to go to obtain employment. All village patels were warned where to send applicants. The system worked well, and I am not aware that there was any abuse, or that any bribes were demanded. In fact the position of the Native officers was such as to render the probability of their taking any such bribes most unlikely. If a district officer was of opinion an applicant was not fit to be placed under the Public Works Department, he was sent to a Civil Agency work till fit, and persons on Civil Agency works found to improve and become fit for Public Works Department works were at once transferred.

The officers in charge of the work would gang the people.

Advances were always made to new-comers after the first day or two days' work till pay day came round, such advance being deducted from pay due. Payment should not be daily.

MADRAS.

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Mr. Longley.—The only remedy to prevent hindrances being thrown in the way of the admission of applicants for relief on works and to prevent bribes being taken for admission is (*a*) to provide a sufficiency of European supervision.

I would maintain the present system of coolies being relegated to works by civil officers who should be empowered to examine the nominal rolls of the Department of Public Works in view to ascertain if those so relegated are all employed.

The engineer and medical officers should do the classing, and the ganging may be left to the overseer. Owing to desertions and various causes, there are daily gaps in all the gangs into which able-bodied new-comers could be drafted, the feeble being sent to special gangs worked proportionally to their strength.

New-comers ought to be paid daily, and the cashier ought to be present at the enrolment each morning to note the names of those in each gang who should be paid daily for a certain period. Those who come on the work during the day and work for a broken period ought, if it is their first coming, to get at least the civil agency wage. If habitual deserters, they ought not to be paid for the broken day.

Mr. Price.—I presume that the question refers to large works. I would have a civil officer, European or native, permanently stationed on a work of any magnitude expressly to receive applicants and decide as regards their being taken on. My experience always has been that the head coolies (gangsmen) were the people who levied black-mail for admission. I would have all applicants admitted by the civil officers inspected and classified by the medical and Department of Public Works officers in charge of the works, or an efficient subordinate. I think that it is a mistake that civil officers should classify. The drafting off into gangs after the coolies have been admitted should be entirely in the hands of the officers of the Department of Public Works, care being taken that families and relatives are not, except as a punishment, separated. In Cuddapah we paid new-comers daily for three days, then every second day three times, and after that they went upon the ordinary rule of twice a week. I never would take coolies on the works after midday. Those who came after the period of grace allowed after roll-call to the people on works were taken on on the understanding that they were paid only a half day.

Mr. McWebster.—The Munsif Monegars (head-men) of villages being cognisant of the circumstances of each individual should send applicants for relief to works with a ticket. Counterfoils of the tickets should be kept in the villages for inspection and scrutiny by the taluk relief and division officers, and these officers also should be empowered to send destitute wanderers to works. Camp-superintendents should also be authorised to send inmates of their camps on discharge to relief-works. The officer in charge of the relief-work should be bound to receive such people as may be sent to works under the above arrangement. The officer in charge of the work should also temporarily classify coolies in gangs immediately on their coming on to works, and the taluk relief or divisional officers should be entrusted with the final classification at their next visit to the works. To carry out this arrangement and to avoid confusion, it would be necessary to keep all new admissions between the taluk relief and division officers' visits in distinct gangs. The officer would then classify the new admissions according to their capacity for labor and other circumstances, such as connection by villages, families, &c. He would then inspect the coolies already classified, and would transfer the weakly in the professional agency gang to the civil agency gang, and the strong in the latter to the former. Coolies once classified should not be transferred to another classification except by the taluk relief or division officer. Coolies coming on work during the day and working for a broken period should be paid the full daily wage.

Mr. Knox.—The present system under which coolies are sent on works by civil officers with nominal rolls works well on the whole. The system prevailing in my division is this: for the purpose of sending on works, the civil officers are divisional officer, tahsildars, deputy tahsildars, and taluk sheristadars. The nominal rolls are printed and have spaces for twenty-five names, as this size was found to be convenient. The coolies themselves took the nominal rolls to the overseers on the work, and the signature of the civil officer was his authority for admitting them. Civil officers did not necessarily give nominal rolls to all who applied to them. The general rule laid down was that, as the Reddi of a village was the only man who knew the circumstances of applicants for relief, all persons wanting to be taken on should, in the first instance, go to their own Reddi. The Reddies were furnished with some nominal rolls, and they would prepare them, in the first instance, and would then send the people to the civil officer who, if satisfied, would sign the roll.

This system provided that the Reddi who knew his people should first as it were recommend them for works, and he could be held responsible for his recommendation. The rule was, however, relaxed to this extent, viz., that when people who were emaciated applied direct to a civil officer, as they often did, they were given a nominal roll, as their appearance was sufficient evidence of their need of relief. Robust applicants were referred to their village Reddi.

I cannot say whether bribery took place or not. My impression is that no set of rules, however perfect, could possibly stop bribery in this country.

I am inclined to think that it would be an improvement on the present system if not only civil officers (as specified above), but also inspecting officers, Revenue inspectors, and village Reddies were empowered to send on works direct; it would sometimes save delay as I have occasionally seen coolies with nominal rolls wandering about looking for the civil officer who happened to be absent. If the authority was abused the sender would be known and could be brought to book.

Once the coolies are admitted on the works I would leave all classification and arrangement into gangs to the Department of Public Works officers.

Mr. Oldham.—(1.) To secure the admission of deserving applicants for relief on works without hindrance and without bribery the power of admission should be rigidly confined to the officer immediately in charge of the work; that is, the overseer or superintendent; and his subordinate gang-writers as rigidly prevented from exercising it. To each of these men should be handed over their gangs when formed and registered, immutable for the time being.

(2.) To provide for admissions there can be one or more depôts on the work at which new-comers will naturally congregate or to which they can be referred. In practice, these were generally at the superintendent's hut or tent; and the superintendent used to classify the new-comers and draft them into the incomplete gangs in the different classes till these gangs were filled up, when they were transferred to another part of the works and new gangs opened for the reception of new-comers.

(3.) The present rules of the Madras Government as contained in their G.O., of 24th September 1877, providing for the admission of applicants on relief-works only through the civil officers leave, I believe, no opportunity for bribery, nor, except in as far as it is imposed by the distances which the applicants have to travel, for hindrance. But in the height of the famine last year, when the relief-works were the great receptacle for persons in an advanced state of distress, those rules could not have been enforced with the staff of civil officers then available, without entailing a much greater mortality than actually did occur.

(4.) If payment is not made daily, the new-comers should be paid daily till pay-day comes round; and if the wage be a subsistence one should receive the full wage, no matter how small the fractions of the day for which they have worked. The difficulty is to provide for their maintenance, when wages are not paid daily, in the interval which follows the first pay-day after their arrival. This interval at this moment is the cause of desertions from the works by emaciated people who straggle back to beg in the bazaars from which they have been already picked up.

MYSORE.

Mysore.

Major Scott Moncrieff.—It is of great importance on a large work of 10,000 coolies or so to have a good civil officer, and it is best that all applicants for work should be referred to him. There are not likely to be many bribes given for admission to a work. Where is the pauper cooly to get the money to bribe? Payments *must* be made daily to begin with. For the first day a subsistence wage may be given, and the same for broken periods or when the work is stopped by rain.

Colonel Johnson.—Put in a good man and make him responsible. A few general rules would probably suffice for his guidance in the matters noted. Hard and fast rules on minutiæ often do more harm than good; good men treat them as waste paper, and indifferent men stick to them when they ought not to do so.

QUESTION 16.—THE KEEPING OF REGISTERS ON RELIEF WORKS.

What registers should be kept up of the number and classes of persons on the works, the numbers who are daily admitted, or who leave, the wages paid, the number punished by fine, the quantity and value of the work done?

Punjab.—The usual P. W. D. forms.
North-Western Provinces.—Ditto.
Bombay.—4 answers. The usual P. W. D. forms.

Bengal.—*See* Mr. Kirkwood's reply.
Madras.—Replies from 15 European and 1 Native gentlemen. They cannot usefully be summarised.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Colvin.—We keep no nominal register on the works except the daily numbering which is made when the people are paid, and which shows daily the number of men, women, and children on the works, and the places from which they came.

Bengal.

BENGAL.

Mr. Magrath.—The register kept by a sub-overseer would be the number of gangs, head of gang by name, persons composing each gang not by name, but so many men, so many women, and so many children. This should be divided into daily columns, each daily column having a subdivision for full work, half work, no work.

This would be checked by the pay department when they come round, and also by the overseer and other upper officials, who could when they came round, by taking here and there a gang and counting it, send for comparison to the pay department their report. The pay department would then deduct from the sub-overseer's pay any excess that might be paid to the gangs. As the new daily admissions would all go into fresh gangs there would be no admissions by the sub-overseer.

Mr. Kirkwood.—On relief works the following registers should be kept up:—

A. (1.) Number of persons on the work at the close of yesterday, showing separately men, women, boys between 12 and 15 years of age, children between seven and 12 years of age, children under seven.
(2.) Number of persons who have to-day left the works, classifying them as above.
(3.) Number of persons who have to-day been admitted to the works, classifying them as above.
(4.) Number of persons on the works at the close of the day, classifying them as above.
(5.) Remarks.

Under this head should be entered the reasons assignable for the leaving, the condition of the admissions, the general condition of the work-people, their discipline, their sanitary arrangements, whether the new-comers came from a distance, the nature of the weather, the price of grain, salt, and vegetables on the works, whether they are easily procurable or not, and whether they are obtained from private dealers or from a Government shop.

The work register should be as follows:—

B. (1.) Description of work.
(2.) Amount of work measured during the day.
(3.) Average measurement per labourer (obtained by dividing column 2 by column 4 of A).
(4.) Remarks.

Under this head should be entered whether the work is satisfactorily done, how many days' work remain before a movement elsewhere will have to be made, how it is proposed to move the gangs, &c.

The cash account should be as follows:—

C. (1.) Amount of money in hand last evening.
(2.) Amount received during the day.
(3.) Total.
(4.) Disbursed to labourers for works.
(5.) Rate of remuneration.
(6.) Other disbursements (such as pay of establishment, hutting repairs, gratuity to labourers), with a specification of the expenditure.
(7.) Total expenditure.
(8.) Balance in hand at the close of the day.
(9.) Remarks.

These registers will have to be written up daily by the overseer. If the pay officer is a separate official from the overseer, then the cash account will be kept by the pay officer. Copies of the entries in each of these registers for the week should be made on every Saturday evening and duly totalled, and then despatched by the overseer to the person under whose orders he is working (Public Works Department or civil officer). Punctual submission should be insisted on. A foot-note should be added to the weekly *Return A.*, showing the daily average number of work-people (classifying them) for the week, and contrasting that average number with the average daily number in the previous week. This foot-note should also mention what proportion of the people are hutted on the works, and whether there is sufficient hutting accommodation on the works for all who desire it; also the condition of the huts. A foot-note to *Return B.* should show the average daily out-turn per person for the week, and the average daily out-turn per person for the previous week should be contrasted therewith. A foot-note to *Return C.* should state the average daily earning per labourer during the week, and contrast it with that of the previous month. If the overseer supplies tools to his labourers, he will have to keep up the following register: (1) number of tools fit for use in hand last evening; (2) number received; (3) number reported missing, broken, or worn out; (4) number fit for use; (5) remarks. Under "remarks" it should be stated if any more tools are required, also the cause of the missing or broken tools, whether anyone is to blame, and whether the value can be recovered from anyone.

This register will likewise be kept up daily, a weekly extract being submitted.

All inspecting officers must closely examine the registers A, B, and C, and see that they are written up to date, initialling them and noting the date of their visit.

I have already elsewhere referred to the measurement-book which every overseer under the piece-work system is to keep up. This book should be denoted by the letter E, and should show in detail (1) date of measurement; (2) the size of each excavation; (3) the mile or half mile in which it lies, and a general definition of its position; (4) the amount due for it; (5) the rate

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of remuneration; (6) the amount paid; (7) date of payment; (8) the name of the person (the selected head man or woman of the sub-gang) to whom paid; (9) remarks. Under this head should be a remark against any excavation calling for it, as to the ease or difficulty of the work, the manner in which it has been done and in which the earth has been thrown, &c.

Every inspecting officer should check this register E by close investigation, by making calculations, by testing the reliability of the remarks, by testing the accuracy of the measurements, and by questioning the labourers as to the amount received. He should also check the entries in B and C by the entries in this register E.

Except under the daily-wage system, I do not think there is any necessity for writing the names and residences of the labourers at length. That is a detail pleasant enough to possess, but its practical value is small, and the labour involved in procuring its accuracy is great and tedious. Every register should show, at its head, the name of the work to which it refers, and its entries must be daily signed by the overseer in charge.

A daily memorandum should be despatched every evening by the overseer to his immediate superior, showing the number of persons (classifying them) on his work that day, and mentioning any notable circumstances.

BOMBAY.

BOMBAY.

General Wilkins.—The usual Public Works form of register, or muster-roll, with morning reports, and figured abstract should be employed.

Mr. Norman.—This question can best be answered by officers of the Public Works Department. The civil officer, in passing applicants on to the works, should keep a register containing the name, age, caste, and residence of all persons he may pass.

Mr. Spry.—The standard forms of muster-rolls contain all the information under this head that is required.

Mr. Robertson.—The Public Works Department can better answer this question. On Civil Agency works the muster-rolls give the necessary information. The quantity and value of work done on Civil Agency works can only be told when an officer can be spared to measure it up.

MADRAS.

MADRAS.

Major Baynes.—*List of permanent returns.*—General admission registers of laborers and their children.

———— Daily and weekly tabulated statement of numbers on work, in hospital, and in camp kitchen.

———— ———— Hospital general register.

———— ———— Nominal rolls of gangs, of nursing mothers, of children of workers receiving subsistence dole.

Cash account of relief expenditure.

Weekly tabulated statement of wages paid, work done, and amount of fines inflicted.

Account of tools.

Account of receipt and issue of supplies to hospital and kitchen by store-keepers.

Child's kitchen register.

MINOR FORMS.

Hospital daily state.
Daily state of workers.
Gangsman's daily state.
Gangsman's list of vacancies.
Child's kitchen daily state.
Indents for tools.
Return receipt of tools into store.
Out-patient hospital tickets.
Sick tickets for Class II. laborers.
Children's admission tickets.
Labor admission tickets.

QUESTION 17.—ORGANISATION OF RELIEF WORKS.

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Describe the organization of a well-managed relief work, the number of gangsmen and of labourers in each gang, of overseers over the gangsmen, of registering clerks and paying clerks or cashiers, and how the upper supervising staff is constituted. State also in what form, and at what periods, progress and other reports are sent up to higher authorities.

Bombay.—3 answers. Not summarised.

North-Western Provinces.—Various statements given.

Bengal.—Ditto.

Punjab.—Ditto.

Madras.—Replies from 12 European and 1 Native gentlemen. Not summarised.

NORTH-WESTERN PROVINCES.

NORTH WESTERN PROVINCES.

Capt. Home.—The following is, as far as I can remember, the organization on the Bulandshahr Right Branch in 1861. The daily number of labourers rose as high as 10,000 per diem, and averaged about 8,000:—

Engineer.

1 Assistant Engineer in charge.

Office and Petty.

1 Naib Munshi	@ Rs. 15
1 Treasurer	„ 20
1 Chaprassi	„ 5
1 Daffadar	„ 6
4 Barkandazes	„ 4

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NORTH-WESTERN PROVINCES.

Works.

1 Head Muharrir	@ Rs.	25
1 Head Mistri	"	20
12 Muharrirs in charge of parties	"	15
12 Mistris	"	10
1 Muharrir in charge of tools	"	15

The parties were divided into gangs of about 40 labourers each, under a mate on two annas a day, and each gang had a bhisti attached to it on the same pay. One or more carpenters were provided for each party for replacing handles of tools.

Reports were submitted weekly somewhat in the form given in para. 16, and at the end of the month the total number of labourers, the expenditure, and the work done were submitted with a concise report of the month's operations.

Mr. Cordner.—(*a.*) The general organization of a relief work depends so much on what the work in question actually is, that it is difficult to lay down the proportion of establishment to number of labourers in a gang. In the work described in answer to Chapter III., para. 2, the number of men in a gang varied from 20 to 100, and had one gangsmen. A sub-overseer had charge of from 5 to 10 miles of a road and from 500 to 1,500 labourers, according as the work was light or heavy embankment.

An overseer had generally charge of about 40 miles of road, or from 4,000 to 6,000 labourers. Cashiers' offices were generally placed about 10 miles apart.

An Assistant Engineer had charge of from 80 to 100 miles of road, or had from two to three overseers under him.

Mr. Colvin.—Daily reports are sent to me. Our organization was as follows :—

I.—*Receiving Labourers.*—These are received by overseer or sub-overseer in charge of work, at some fixed point, usually a tope of trees, where spare tools are stored for issue.

II.—*Putting them to work.*—New arrivals for the day are put to work as soon as those who have already been on the work for some time have fairly commenced for the day.

III.—*Distribution by Gangs.*—Gangs are made up in thirties, *i.e.*, 10 diggers (stout men) and 20 carriers, being a proportion of weaker men, women, and children, as the numbers run. People from the same or neighbouring villages are encouraged to form their own gangs, and every endeavour is made to see that the average strength of each gang, as a gang, is uniform. New arrivals are formed into fresh gangs, and any surplus divided amongst other gangs where a member may be missing.

IV.—*Provision for Weakly.*—The weakly people who are however able to work, are divided amongst the stronger in as fair a proportion as possible, and the task regulated to suit. Those who are unfitted for work are sent to the inefficient gang.

V.—*Musters.*—Nominal rolls of *all* are not kept, nor attempted to be kept, but one ganger is told off to every four gangs (120 people) and one muharrir to every 20 gangs (or 600 people). Each gang selects its own "mate" or "tindal" who also works, and the muharrir takes down his name daily, with the number in his gang, men, women, and children.

VI.—*Measurement of Work done.*—The work done by each gang is measured up every evening after 4 o'clock, and the value of the total work done, at the fixed rate, is paid to the "tindal" of each gang, who distributes it in proportion to the members of his gang for the amount of work done during the day by each. Should the individual members complain about not getting their fair share, the pice is distributed to each individually by the overseer or other officer.

VII.—*Rates of Pay.*—The rates in this district vary with the soil from 2 to 4 annas per hundred cubic feet (Rs. 1-4 to Rs. 2-8 per thousand) for rough undressed earthwork, paid to labourers and all tools found them ; Rs. 0-2-6 is the usual rate. The average task per head, all over the district done, is about 36 cubic feet.

VIII.—*How, Paid.*—The people are invariably paid in hard cash, Government pice being used for the purpose of 4 pice to one anna.

IX.—*Nature of Tickets.*—Tickets are not used on any work except that road kept for the inefficient gang and people sent from head-quarters poorhouse, from which people are sent as they improve in condition and are considered able for work. Tickets are only issued to them as a check to prevent all comers seeking work on this road, where the average task is slightly easier.

X.—*Provision for Labourers at Night.*—No arrangements of this kind have been found necessary for the ordinary gangs, the people all scattering to the neighbouring villages, which are numerous near all works in operation and to which they generally belong. During the extreme cold of December and January, chhappars were sent out from poor-house for poorhouse people, but very few remained in them; they preferred going to the nearest villages. Hutting, however, for inefficient gang has been regularly provided.

XI.—*Provision for Sick on the Works.*—There is a hospital with the inefficient gang, and a compounder with medicines with the able-bodied gang.

XII. — *Payments for Sunday.* — As on other days.

XIII.—*Aid received from Civil Departments.*—Tahsildars have been provided with large imprests, and have been employed in collecting tools (phaoras and baskets) which they store at tahsils, and issue to works on direct indents from overseers. Collector has also appointed civil officers to patrol works regularly to ensure the people being properly paid ; a civil officer has also been appointed to look after hospital and other arrangements with the inefficient gang, and the classification of people (or census) is always done by civil officers.

XIV. — *Conservancy.* — Moveable latrines might have been adopted ; but a special establishment would have been needed to force people to them, and as the work area is always shifting, I saw no need for this.

XV. — *General.* — The system adopted in this district is to pay through contractors or cashiers, who are bound to give the coolies the rate fixed by Collector, and are paid in proportion. Daily returns are received showing the numbers, amount expended, and quantity of work done, and on these cheques are issued daily to contractors, who arrange for the drawing of money from treasuries and collection of pice, and whose men accompany the overseers during measurements, and pay the value of amount done. The excavations are arranged in such a way, each tank or "khassa" being kept quite distinct, that no fraudulent measurements can occur, as the final measurement will show it at once, and the contractor will only receive final payment for the quantity of work done, on completion of "dressing," &c. The patrolling of the works daily by a civil officer checks any attempt to cheat coolies or underpay them.

XVI.—*Scale of Establishment employed on the Work.*

		Men.	
1 Overseer	per	4,000	Employed by Public Works Department.
1 Sub-overseer	"	1,000	
2 Munshis	"	1,000	
10 Chaprasis	"	1,000	

North-Western Provinces.

2 Munshis	,, 1,000	Employed by contractor, who, however, was rather a paymaster than a contractor. He found the money, made the measurements, and paid all wages, under check and supervision of Department Public Works officers and officials, receiving a per-centage on his payments.
3 Chaprasis	,, 1,000	

Mr. Cornwall.—The relief work in this district, which was confined entirely to the re-construction of the Mogal road, was managed by the District Engineer in the following way:—

When distress appeared, work was commenced at the Etàwah boundary, by lining out and dividing the road to be constructed into pieces of 200 feet in length, which were given to contractors, taken at first from the skilled labourers on the spot, and afterwards from such men as appeared most intelligent and fit for supervising such work.

As the people arrived, they of their own accord joined one or other of these contractors, and in the evening the contractor or ganger received a portion of the wages due, calculated on the probable quantity of the work done, and the number of labourers employed in his gang on that date.

The contractor distributed the greater part of this money amongst them, and at the end of the week his work was measured up and payment made in full.

This way was simple enough and gave no trouble till the ticket system was introduced, and a scale of pay to each individual insisted on by Government, when the following arrangements had to be adopted:—

Before commencing work in the morning, the men, women, and children were collected separately and counted; after this they were divided into gangs of from one to two hundred, and baskets and phauras were supplied to those who came without them; these gangs were then marched on to the work, which was already prepared for and marked out for them.

The labourers were allowed two hours' rest from 12 to 2, and were again counted before they went to their work, but this time each person got a ticket which represented the amount he was to receive when his work was finished.

The workmen were also counted from time to time in the morning and in the evening at irregular hours by the District Engineer and his European subordinates.

Work was struck at 6 P.M., and payment made under the supervision of the District Engineer.

Progress reports were furnished once a week showing the number of men, women, and children on the works, with the amount expended during that period.

The answer to this question was written by the District Engineer.

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Bengal.

Mr. Worsley. — On a well-managed relief work 5,000 or 6,000 labourers are employed under a supervising staff of one assistant engineer or civil officer, and an overseer. The labourers being divided into gangs of 20, and represented by sirdars, are paid in the course of 15 or 20 minutes every evening by the assistant engineer, who, on the authority of the measurements made by the overseer, pays the amount due to each gang into the hands of the gang sirdars. The assistant engineer resides on the spot, and with the aid of one overseer and the gang sirdars can keep thoroughly in hand even so many labourers as 10,000. In March 1874 I accompanied Sir George Campbell on a visit to a relief work in Durbhunga, which was managed in the above manner under the control of the Durbhunga Raj Engineer Mr. A. W. Stevens. We saw some 6,000 labourers paid in a quarter of an hour, and the Lieutenant-Governor expressed himself greatly satisfied with the system.

Mr. Magrath.—So far as I remember, the arrangement we arrived at was each gang so far as possible to consist of 20 persons, eight men, six women and boys, and six children, but this had to be modified occasionally. Amongst the men were boys over 16 who would do a full day's work; whereas amongst some of the labouring classes one man could cut as much as two women and one or two children could carry.

We allowed less men in proportion; each of these gangs had its ganger who received 2 annas instead of $1\frac{1}{2}$; 10 gangs went to each sub-overseer, and 10 sub-overseers to each overseer. The upper subordinate staff was so weak that we had to give the supervisors a very large number of overseers. We had not men to form a paymaster's staff, but paid through the overseer and sub-overseers. The sub-overseers sent a report to the overseer, who forwarded the report, with his remarks, to the supervisor, who had already indented for and received the probable amount payable. I would, however, have a supervisor over every five overseers, and conterminous with the supervisor's limits I would have a paymaster, with a pay-clerk for every sub-overseer. The pay-clerks should be carefully sent to different sub-overseers daily, and should at intervals be changed from one paymaster to another to prevent collusion. The paymaster and his clerks should every morning work up their returns of the day before and send them to the head-quarters accounts establishment, where they would be checked with the lists of the sub-overseers, copies of which should be daily taken by a supervisor's clerk appointed for the purpose, and the reports of the overseers and supervisors and superior authorities of the numbers which they found in the gangs. (In practice, I found that the gangs were nearly always full in number.)

The superior account department would, of course, prepare all the returns required for Government, and the reports would be sent by the civil authorities, but it must distinctly be understood that these must be of a very simple character. But that the subdivisional officers took upon themselves the onus of not keeping the cumbrous gola and progress returns desired by Sir George Campbell, people would have been left to die for want of food or pay whilst the goladar's relief officers were making out the returns.

Mr. Metcalfe. — Relief work having been determined upon, the work is marked out by a Public Works overseer or some other competent officer. The line of the excavation is also demarcated and marked into lengths or plots of a hundred feet long. The sections of road are then placed in charge of what in Behar were called monsarims. It was the business of these officers, on distressed persons arriving at the works, to allot to them lengths on either side of the work. The officer kept a register in which were entered the date, the number of arrivals of men, women, and children; and if they were utterly destitute, he was authorised to make them a small advance of grain. The labourers being supplied with baskets and spades are then set to work, receiving for their labour at the rate of four annas for every hundred cubic feet. The monsarims in the afternoon of each day calculate the work which has been done for each 100 cubic feet completed, and give the labourers a ticket for payment in grain on the nearest granary; or if there be no such granary, it is the duty of a monsarim to give each labourer a ticket on the officer whose duty it is to pay. It is the duty of the paying officer to visit certain central spots along the line of work daily, and

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to pay the labourers according to the amounts entered in the tickets. A superior officer should weekly supervise the measurement of the work done, and compare the amount entered in the registers with the quantity of earth excavated. The employment of gangsmen has been found open to great objection. It is better to allow small parties of labourers each to appoint their own headman to watch measurements and receive payments on their behalf. No progress reports need be submitted by the monsarim: the weekly inspection by an engineer or his assistant, or by the circle officer, being a better method of ascertaining the progress of works than reports by subordinate officers. It is convenient for the circle officers to submit progress reports, as was done in the Behar famine, fortnightly.

Mr. Kirkwood.—I have already to a great extent, in answer to other questions dealing with the "piece-work" and "daily-wage" systems, anticipated this question.

Under either system there should not be more than 2,000 people in a gang. Where there are more, any difficulty in discipline becomes proportionately very much greater. So also will the task of controlling sanitation and of supplying provisions.

For these numbers, under either system, one overseer should suffice. On piece-work, one paid gangsman to every 400 labourers will be sufficient. On daily wage, the number of gangsmen will probably have to be four times as great. To the overseers there should be attached two chaprasies, who would, among other things, throw the pole with which the measurements of the work are made; they would also bring from time to time the necessary cash from head-quarters. To the overseer should also be attached a registering clerk, who should, under the overseer's supervision, keep up the registers and otherwise assist him.

On light-labour piece-work the following remuneration for the *employés* will be found suitable:—

Overseer.—Rs. 20 per mensem, *plus* a commission of one anna for every 1,000 cubic feet of earthwork done, half anna for every 1,000 superficial feet of turfing done, quarter anna for every 1,000 superficial feet of dressing done; with a full-sized gang of 2,000 persons this commission comes to about Rs. 70 or 80 per mensem. This commission is only to be paid on measurements as found by the departmental check measurement.

Registering Clerk.—Rs. 15 per mensem.

Gangsman.—Rs. 7 per mensem.

Chaprasi.—Rs. 5 per mensem.

The overseer should give security in Rs. 500 on his appointment, which security should be liable to confiscation on the occurrence of defalcations or of misconduct.

The establishment should be paid regularly on the 1st of every month, and the commission should in the first place be paid on the work as returned by the overseer. Any deduction from commission which the Public Works Department check measurement may subsequently show to be necessary should be made from the commission of the next month. Punctual payments of wage and commission engender confidence and a belief that a substantial livelihood is obtainable without fraud; uncertainty in the payment of wage often drives *employés* to make fraudulent earnings the certainty, and wages the accidental accessory.

The labourers under each gangsman should be allowed to arrange themselves into sub-gangs of from five to ten each, and every aid should be given them in thus drawing together people of the same family, caste, or village. Care should be taken that the labourers are not incommoded by being crowded too close together on the works.

Under the daily-wage system, as I have already noticed in answering questions 7 and 8, there will have to be a very reliable officer (who should generally be a native military officer), with strict ideas of probity and discipline, for the purpose of distributing tickets to the workers, which tickets the work-people will at evening-time cash at the pay office on the works in the presence of the ticket distributor, overseer, and gangsmen. The manner in which the works should be supervised and payment should be made under the daily-wage system has been set forth in answers to questions 7 and 8. The duties of the overseer and of the gangsmen, and the manner in which payment should be made to the labourers on piece-work, has been dealt with in answers to questions 10 and 11.

Baskets should be provided by the workers themselves. This is the only way to make them careful. If baskets are given them, they will be broken up for firewood, lost, or thrown away within a few days. They, moreover, present the overseer with an opening for making false and uncheckable charges. If the people find them for themselves, the cost is very trifling, probably half an anna per mensem for each person.

BOMBAY.

BOMBAY.

Colonel Jones.—The gangs should average about 50 persons, with a muccadum or head cooly on relief wages, who should be held responsible for the tools and general conduct of his party. One mustering karkoon and three trained muccadums for eight gangs or 400 persons; one maistry to 32 gangs or 1,600 persons. As many cashiers should be provided as may be practically found necessary to secure prompt payment. The upper supervising staff should consist of the upper and lower subordinates of the Public Works Department. The sub-overseers to work out the task-work, &c., under the general direction of the upper subordinates.

The forms sent up to higher authorities are annexed:—

1. Weekly Progress Report.
2. Return of Expenditure upon children under seven years of age.
3. Return of Expenditure from the Discretionary Grant of Collectors.
4. Return of Deaths on Famine Works.

General Wilkins.—Every large work should be in charge of a European officer, with an establishment of subordinates of the upper and lower Public Works permanent Establishments, and with temporary establishments of

Cashiers.	Maistries.
Karkoons.	Muccadums.

If relief works are scattered over a Collectorate in the shape of roads and tank works, every taluka of the district should be placed in the charge of a European officer for the management of relief works in his taluk. Every taluk should also have its civil officer to act in conjunction with the officer of relief works.

The number of relief labourers an officer is capable of supervising will depend whether the people are concentrated or scattered. As a limit no officer should have more than 10,000 persons in his charge, and it is advisable that the charges should not exceed 8,000 or 9,000 persons.

Thus a well-organized centre of relief should comprise the following establishments:—

Permanent Establishment.	Proportion to People.
1 Assistant Engineer -	- 1 to say 9,000
3 Upper Subordinates -	- 1 to 3,000
3 Lower Subordinates -	- 1 to 3,000

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Bombay.

Temporary Establishment.

3 Assistant Engineer's Clerks	1	to	3,000
3 Cashiers	1	to	3,000
15 Maistries	1	to	600
20 to 30 Karkoons	1	to	300 450
225 Muccadums	1	to	40

Weekly reports should be sent in by officers in charge of works, giving the following information:—

1. Numbers on works.
2. " " previous week.
3. Increase or diminution.
4. " " of men.
   " " women.
   " " boys.
   " " girls.
5. Expenditure during the week.
6. Work performed.

The duty of taking on people, seeing that they are not defrauded by the karkoons and muccadums, and that the work is speedily performed, is so continuous and absorbing that the Public Works officer should be aided in this matter by an officer who should be a European. Many officers of the army were engaged on famine works in the Madras Presidency with the utmost advantage to the people.

The European element was found better adapted than the native element in supervising the people. Full establishments are economical.

Mr. Spry.—Officers of the Public Works Department are best able to describe the organization of a well-managed relief work under them. I can only speak of Civil Agency works, where I have always found a difficulty from insufficiency of properly qualified establishment. As far as I can I will give what I consider sufficient—

1 muccadum over every gang of 50 labourers.
1 mustering and registering karkun over every 5 gangs.
1 maistry and registering karkun over every 5 gangs.
1 cashier for every 10 gangs.
1 overseer for avery 20 gangs.

Over the overseers comes the officer in charge of the taluka or other officers specially appointed, but as I have said before, civil establishments are not properly qualified to superintend relief works, and fail more especially in strength in the upper grades. The morning reports should be submitted to superior officers just on the same principle as is carried on in the Public Works Department.

CENTRAL PROVINCES.

Central Provinces.

Mr. Nicholls.—Such a measure for the purpose of preventing those who are not in absolute want of relief would be perfectly unnecessary in these provinces, where, in addition to the standing rules of hard work and little pay, the apathy and detestation of the people in Chhattisgarh and on the rice lands generally, to such kinds of work as we could give them, and the independent spirit or the sense of shame in the people elsewhere, may be safely calculated on to keep the people other than those in absolute want of relief from asking for work.

Removals of bodies of men on works should only among us be resorted to to prevent sickness, to remove them from a locality of deep distress to one in which food was not so dear, water more abundant, regular supplies more easily assured, better supervision maintained, or the like.

MADRAS.

Madras.

Major Baynes.—That work is best organised which most largely secures facility of admission to work, regularity of measurements, and payments; check on peculation; sanitation of the camp; regular submission of returns.

The first four subjects have been fully discussed in preceding paragraphs; the attainment of the fifth is dependant upon the efficiency of the office clerks and the regular submission of returns from the field subordinates. I have not had much experience in carrying on a large relief-work to which a camp was attached, but I may remark that from what I have had, the same principle which regulates the economy of a regiment appears to me applicable to any mass of men. The first object is to get the laborers into conveniently-sized parties for supervision and control; I should, therefore, first divide them into divisions; the strength of a division would be that number of laborers which an overseer could thoroughly supervise, and whose outturn he could measure up in one day once a week; next, this division would be subdivided into such parties as one man could pay daily; this number, as stated in paragraph VII. (*g*), should not exceed 800; then into such companies or gangs which one man can control; this number of a gang has been fixed at 100, paragraph VII. (*b*). I have not any experience of what an overseer can measure in a day further that what I can do myself; but I think sixteen such gangs would be enough to occupy one man. For sake of argument, let these figures be assumed correct, then the strength of a division would be 1,600 laborers, and the staff would be—

One overseer,
Two paymasters,
Sixteen gangsmen,

and for maintenance of discipline in camp and to keep the latrines clean there would also be required—

Sixteen warders,
,, scavengers,

as shown in paragraph XII. Each such division should have its own camp formed as described in paragraph XII. (*a*); therefore gangs should be composed entirely of caste persons and pariahs and should be named after its overseer; the gangs should be numbered consecutively: thus, if Ragavayengar was the name of the division overseer, then the gangs would be known as Nos. 1, 2, 3, &c., Ragavayengar's division; the division should be kept intact as an unit at work, so that an applicant for work should have no difficulty in finding the gang to which he is posted—see paragraph XV.

The overseer, according to the suggestion made in paragraph VI. Chapter II, would be under the immediate orders of the Public Works Department officers, but his duty would, I presume, be to exercise constant supervision over his gangs as to the proper conduct of the work and to take measurements of outturn, so as to enable the nominal rolls or pay sheets to be adjusted weekly; he will also have to furnish the register clerk every evening with a statement of vacancies in each of his gangs, so that new arrivals may be posted to gangs expeditiously and advantageously.

The paymaster should, according to my scheme, be unconnected with the Public Works Department and under the orders of the relief officer; he will pay every individual of his sub-division daily after making a final payment in adjustment of a nominal roll (that is after the weekly measurement has been taken); he will retain it and send it into the camp office for

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MADRAS.

audit—see paragraph VII. After the cashier's account is audited, these rolls should be sent to the engineer officer for check on measurements and record.

The gangsman.—He must be able to read and write the vernacular of the taluk; he should muster his gang morning and evening and remain with it whilst at work; should a member fall sick on the work, he will send such person with a ticket to the hospital; this ticket should be returned by the medical officer endorsed admitted as out-patient or in-patient, or refused treatment. On receipt of the ticket the gangsman will make corresponding entries in his nominal roll, and he will submit every evening to his overseer a "strength statement," showing number of casualties or vacancies, which should be given in by the overseer to the register clerk; he should muster the tools of his gang at the same time he musters the members of it, and report at once the fact of any tool being missing or broken. Mahomedans are the best class for this employment, but they are seldom educated, and therefore cannot be procured in sufficient numbers. Gangsmen would be under the immediate orders of the engineer. Over a pariah gang a Mahomedan should always be placed. The duties of a gangman on Class II. work are slightly modified.

Mr. Oldham.—1. Under the daily task-work system my practice was, as regards registers, vouchers, payments and paying agencies and accounts different from that in force in the rest of the Bellary District. I still adhere to it as the best.

For every fifty laborers there was a head cooly or gangsman, for every five such gangs a gang-writer. For every six gang-writers there should be a paymaster, subordinate to the Treasury Department as apart from the subordinate work department, and for every twelve gang-writers there should be an overseer or superintendent. For the latter post intelligent British soldiers or non-commissioned officers or commissioned or good non-commissioned native officers of the Bengal Army—particularly of the cavalry—do excellently well. If this superintendent has his full 3,000 laborers there ought to be a distinct agency for assigning and measuring the work.

Five gangs are formed and registered. The register is signed by the superintendent and made over with the gangs to the gang-writer. This nominal roll is in a permanent form, and, as it does not contain columns for daily attendance, can last for months. For if a laborer is absent at roll-call or pay time his name must be struck out and the date of doing so only need be entered. The absentee can only gain re-admission through the superintendent. Fines are similarly noted, and the dates of new admissions.

The gang-writer must furnish the paymaster every evening with an abstract slip of the numbers of men, women, and children in his gang. Copies of these abstracts are kept in his permanent nominal roll-book in successive columns at the end of it.

The superintendent, as he forms each gang, registers the gang-writer's name with the numbers of laborers in each class assigned to him. As he checks the gang daily at pay time or in the evening, he has only to note the number by which it is short, and frames his return of his numbers accordingly. This return must be sent weekly to the superior officer. If the latter has time or an establishment sufficient to check these returns it is best to send them daily.

To the paymaster is assigned a permanent advance, which he clears and gets renewed by the submission of bills, sent weekly at least, showing the names of the gang-writers whose gangs he has paid, the number in each class in each gang each day, and the total sum paid each day to each gang. With the superintendent's muster return sent daily there is no object in these bills being submitted oftener than once a week, on a fixed day. This bill is accepted as a complete voucher, and is the lowest voucher to which the officer who is responsible for the expenditure need go. When a superior officer inspects the works he sometimes will muster all the laborers on it, and will always check individual gangs, and compare the nominal rolls and the abstracts entered in them with the superintendent's and paymaster's registers and bill-books.

All reports to higher authority, from the Government down to an officer in separate charge, should be sent weekly at least.

MYSORE.

MYSORE.

Major Scott Moncrieff.—Take a gang of 50 as the unit, composed of men, women, and children, as far as possible in the proper proportion for the work to be done, the diggers being the fewer the longer the lead, but also arranged to employ all-comers.

Over every gang have a gangsman.

To every four gangs have a mustering writer.

To every 24 gangs have a sub-overseer.

To every 48 gangs have an overseer or other upper subordinate.

To every 96 gangs have sub-divisional officer. The strength of a sub-division will consist then of—

1 sub-divisional officer (who should be an assistant engineer.).
2 upper subordinates.
4 lower do. (sub-overseers).
24 mustering writers.
96 gangsmen.
4,800 coolies.

There should be two cashiers to each sub-division.

Hospital accommodation for 10 per cent., say 500 coolies and 5 hospital subordinates, should be provided. Also five nurses. *Progress and other reports should be sent up according to the ordinary Department Public Works rules, but weekly reports of the numbers employed; the numbers in hospital should be submitted in addition.*

CH. III. QN. 18.

QUESTION 18.—ARRANGEMENTS FOR THE DISCHARGE OF LABOURERS.

What arrangements would you propose for discharging labourers from relief works when the famine is declining, or over, or when the work is closed?

Punjab.—The people will leave of themselves. No advances have been given.

North-Western Provinces.—The people will go off of themselves. If they do not, the work may be closed or tests made severer. A residue still requiring relief must be taken into poor-houses. The people often have savings to take them home. If not, money or food may be given.

Bengal.—The people will leave of themselves. If not, notice of the closing of the work should be given. Advances to be repaid should be made to the ryots or their zemindars.

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Bombay.—10 answers. If famine continues the labourers will be transferred from the work closed to another. At the end of a famine they will mostly go off of themselves. If they delay, wages may be reduced to subsistence allowance. Poor-houses should be kept open for those still weak. It is not generally found necessary to give the people money when they go. They sometimes have food.

Madras.—21 European and 3 Native gentlemen have replied.

There is a general consensus of opinion that when an improvement of the season offers opportunities of subsistence elsewhere the people leave the works of their own accord. If discharged from a work, and not transferred to another in consequence of the extreme pressure having passed off, they should be furnished with sufficient means to enable them to return to their own homes.

PUNJAB.

PUNJAB.

Mr. Nicholl.—The departure of the people *suo motu* is generally the first sign of the decline of a famine that I have observed. There is seldom any necessity for discharging them. Some of course will linger till the work is closed, which happens when it is known that work may be had in the fields or elsewhere.

No money has ever been given to enable people to reach their homes or to start again in life, nor has any been asked for.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Lawrence.—When the famine is declining, people will begin to leave off themselves. Care must be taken by reducing the wages, as prices fall, to prevent Government competing with ordinary employers of labourers. An increased enforcement of distance test may also be necessary, but all sudden changes should be avoided. It will be found that in the great majority of cases, even on what are called subsistence rates, labourers have saved enough to take them home. In cases when money has not been saved, labourers have been given money to enable them to reach home, and have also been provided with a *khurpa*. Persons who are physically unable to support themselves are still in the Agra poorhouse, and I do not know how we shall be able to get rid of them. The poor-house started in the famine of 1838 lingered on in Agra until now, and at the beginning of the present famine there were inmates who had been there for forty years. This poorhouse or dharmsala, as it was called, was supported partly by municipality and partly by private subscription.

Mr. Whalley. — At the close of a famine the labourers usually melt away of themselves. If they do not, and it appears that a sufficient task is exacted and only a subsistence rate of wages paid, it is probably because their homes are at a distance.

Those who live near will have left the works and those who live far off will remain.

Then it will be necessary to reform the gangs according to villages and parganas, if they were not originally so formed, and calculate the distances to each pargana. The next thing is to separate those who are only deterred from leaving by having no means for the journey, and pay them at the rate of one day's pay for every ten miles they have to go.

If a residue still remains, and it is necessary to close the work, they should be made over to the civil authorities, who will receive them into the poorhouses or put them on small works according to their strength.

Mr. Stoker.—I think the plan adopted in Gorakhpur will probably be found the best. It is to open a workhouse and, closing the works, refer to it all applicants for relief. If the necessity for State relief have really ceased the measure will be effectual. None but the really necessitous will enter a properly managed workhouse.

It would probably be well, as the famine was declining, before resorting to this final measure, to weed the works by application of the distance and labour tests. The numbers remaining to be dealt with by the workhouse system would be few and easily managed.

At a still later stage when the workhouse was broken up the persons discharged received, I believe, a small allowance to enable them to return to their homes or start fair again. Before the final breaking up it would be well to have all the inmates of the rural workhouses drafted into the central workhouse, unless they prefer to return to their homes (when they might be assisted to do so). This operates somewhat as the distance test.

BENGAL.

BENGAL.

Mr. Magrath.—When rain has fallen sufficiently in any portion of the subdivision, notice should at once be given that the work or works fed by people of that portion of the subdivision will be closed in a stated number of days. The civil officer must then make arrangements to see whether the landowners can advance to their ryots, and, if not, should advance to the Zemindars a sufficient sum (on security and recoverable) to maintain his ryots. A three days' pay should be given to the people to start them, and the staff of Public Works officers should, with regular professional beldars, set to work to finish up the roads, &c. in progress. In the famine of 1874 we acted in this way, except that it was not necessary, as a rule, to make advances to Zemindars who were already under advances. The poorhouse people were sent home, and they were given tickets for rations which they sent for weekly—the circle officer making his rounds and striking off from time to time the names of those whose friends became able to support them. The only people that we found unable to support themselves at the end of the famine were those who had never been able to do so.

Mr. Kirkwood.—It may also often be that the cultivator has not the requisite money for the purchase of seed corn, or any fund sufficient for his support while he is labouring in his fields instead of on the works. In these cases it is important that the Government should make advances free of interest and repayable by fixed instalments spread over one or two years. In the North-Western Provinces (1868 to 1870) more than 10 lakhs of rupees were thus advanced by Government. In the Behar famine (1874) a very much larger amount was advanced. I think, in the latter instance, advances were somewhat overdone, and many people thus supported themselves in semi-idleness, who should have utilized the idle days during the cultivation season by labouring on the road. Advances were also made to well-to-do

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Bengal.

ryots, which enabled them, according to their custom in other years, not only to support themselves during the cultivating season, but even to employ hired labour.

I quote at length below what Sir George Campbell wrote in March 1874 on the subject of these advances, I do not concur in the plan of making advances through mahajuns. But, in Bhagulpore, I found a system of advances through Zemindars for distribution to their ryots, and direct to villagers themselves, either on a joint village security or on individual security in the case of substantial tenure-holders, to answer admirably. In Bhagulpore and elsewhere, I believe, in Behar, these advances were made in the grain which Government had imported. The grain was valued at the then rate at which Government was selling from its stores. Deeds were drawn up pledging the repayment of the money in certain instalments, and those deeds were registered. In the case of cultivators taking advances, otherwise than on joint village security, a schedule of any timber, houses, cattle, &c., which were given as pledges for repayment was appended to the deed. I believe the whole amount of the advances thus made in Bhagulpore was recovered within a year or 18 months. Even the poorest cultivator, so long as he held land, was included, if he desired, in the joint village bond, and got his share in the grain advanced to the village. 1,20,000 maunds of rice, valued at about three and a half lakhs of rupees, were thus advanced in June, July, and August. Of this quantity about 80,000 maunds were advanced to 22,000 ryots direct, and 40,000 maunds to 110 Zemindars for distribution to their tenantry.

Registers of all these advances were carefully kept up. Every person, other than a well-known Zemindar, applying for these advances had to appear in person before the district relief officer, by whom only they were granted. The application was then checked by requiring each person to declare verbally how much he wanted, why he wanted it, what property he had to pledge, and by seeing whether his name was on the petition, and that the petition was correctly worded (a form was drawn up), leaving no loophole for an escape from liability. Some reliable person from the village or its neighbourhood, and also the village putwari, had generally to attend to verify the statements of the applicants, and records of the recently introduced road cess were also available for that purpose. Whenever deemed desirable, the application, before being granted, was sent to the circle relief officer for inquiry and report by means of his subordinates and group superintendents, of whom more will be said under the head of house-to-house relief. The advance ultimately granted was, after the deed had been duly registered, paid by orders for grain on the Government grain store most conveniently situated.

Bombay.

BOMBAY.

Colonel Jones.—Due warning should be given to the people to enable them to make their arrangements for leaving the work, and assistance, if necessary, either in money or food, obtained from the civil authorities to enable them to return to their homes.

General Wilkins.—It was not a custom, at the close of the last famine, to give the people money to start again on their ordinary way of life.

Those physically incapable of exertion were taken care of in the poor-houses at the close of the famine. These relief houses were kept open as long as they were needed.

Mr. Norman.—When a famine is declining, many of the labourers leave the works of their own accord. To force others to go, task work must be introduced and gradually enforced with strictness. When the famine is still at its height and a work is approaching completion, arrangements must be made for drafting the labourers, with their muccadums and karkuns, to another work. Certain villages must be selected at places along the route where they will be fed on their journey. It has never been customary to give discharged labourers money, but they have been provided with passes to enable them to obtain food at certain villages on the way to their homes. Persons who remain in a weak physical condition are at last taken to a relief house, where they are fed until they regain their strength, or, if sick, they are treated in hospital.

Mr. Spry.—If a work is closed before the necessity for relief has subsided, the labourers must be transferred to some other work. My experience has been that when from rain falling the people find that there is a chance of getting employment in their own villages they go off very rapidly and voluntarily. They did so in the famine of 1876–77. Ordinarily speaking, nothing was given to labourers so going off; but in a few cases where it was found that people stayed from inability to start at their ordinary occupations they were assisted from private funds. After works were closed, the relief houses remained open for those not physically able to support themselves, but as times got easier, all these gradually went off to their homes and to their friends, so that in a short time the relief houses closed from having no inmates. There was no disposition to remain on for an indefinite period.

Mr. Moore.—I think that the people should be sent off with bread, for the way to their homes. No money should be given, and none has been given. People unable to support themselves have been kept on at a relief kitchen till they recover.

Mr. Hamilton.—When a famine is declining, I think it will be found that the labourers gradually drop off the works, which are never so pleasant nor so profitable as to induce people who can live otherwise to remain on them. Heads of families leaving should be made to take all their dependents with them, including those of their family who are unable to work, or who always live on charity. I never heard of money being given to people on leaving work.

Mr. Percival.—The people will go away when the famine is declining and need not have money given them. If a work is closed during the famine, the labourers should be offered work elsewhere, and those willing to go be paid for the time required to reach the other work. The weak will go away at the end of the famine as well as the strong, if they are made to work according to their ability.

Colonel Anderson.—The labourers will ordinarily be only too glad to go to their homes when the pressure is over and ordinary work becomes avilable, and will gradually discharge themselves. If there was any slackness in their departure, wages should be gradually reduced to a bare subsistence point. I am not aware that it has been necessary to give money to people on departure; they always had some small savings. The last class of people mentioned in this question would resort to their former mode of life, begging and living on their relations.

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BOMBAY.

Mr. Robertson.—During the famine, when a work is approaching completion, the labourers are drafted to another work. When the famine is declining, far greater strictness is used in giving tickets for admission to works; but, as a rule, as soon as prospects brighten, all those who have hopes from the improved season take the matter into their own hands and decamp. A good fall of rain has in one day led to as many as 2,000 to 3,000 people leaving a single work, even without the wages due to them, so anxious are they not to lose a favourable opportunity for preparing their lands.

The labourers are carefully mustered by the district officer in famine charge of the taluka, and all who are cultivators are sent off to their homes.

Those who are sent to other works, or discharged to go to their homes, are given enough money to support them to their homes. No money has been given to start them again in life, but tagai advances have been made to cultivators to enable them to buy seed for sowing and to buy cattle to plough their lands. Such advances after the late famine, in the districts noted below, amounted to—

Sholapur -	Rs.	95,267	0	0
Satara -	„	15,603	5	0
Poona -	„	58,743	0	0
Ahmednagar -	„	7,677	0	0
Total -	Rs.	1,77,290	5	0

Mr. Bosanquet. — When the famine here was declining, the people left the works of their own accord. On a work being closed they were drafted to other works, being paid on the way by an officer deputed to accompany them. They were often, however, unwilling to proceed to a distance for work, and used to desert on the road. No difficulty was experienced, so far as I am aware, in dealing with labourers "who to the end continued in a physical "state in which they were unable to support them-"selves." No such difficulty was brought to my notice.

MADRAS.

MADRAS.

Mr. Longley.—As a rule, when famine is declining or over, laborers will discharge themselves. When the work is very distant, say anything over ten miles from their homes, they ought to receive enough to cover the cost of the journey home, and, if discharged in large numbers, ought to be accompanied by a special officer whose duty would be to pay them subsistence allowance daily and see that arrangements were made for food and shelter at each stage.

When a work is closed the famine not being over, the greatest care is needed to see that the coolies are transferred with proper attention *en route* to a new work.

It has not been customary to give money to laborers discharged to enable them to reach home and start again. As the famine is not over, the occasion has not arisen. This ought to be done.

Those who to the end continue physically unable to support themselves should be retained in hospital camps until recovered. No fresh admissions should be allowed to such camps after famine operations have been closed, and they should be kept going until numbers in them are so small as to admit of transfer to the nearest dispensary.

Mr. Webster.—Laborers should not be discharged from works when the famine is declining, but only when the works are stopped. In this district when works are stopped it has been customary to transfer the coolies to other works.

Mr. Price.—I would, when a famine is declining, go over works and turn off the most able-bodied first. I should not wait until the famine was over to do this. In Cuddapah we closed works by sending the people away gradually in batches, which caused no murmuring, and, I believe, no inconvenience or trouble to the people themselves. One can form, for certainty a month beforehand, a pretty fair idea as to the necessity for keeping works open or not, and this month can be employed in *gradually* reducing numbers until those who are left form so small a number that there is no difficulty in getting rid of them.

This expression of opinion refers, of course, only to works provided in each taluk of a district in which there is no difficulty in the people finding their way home in two or three days at the outside. As regards works at a considerable distance from the permanent residence of the coolies, the best plan, in my opinion, is to draft them back in bodies of 500 a day, feeding them at stations along the route, at which hutting should be provided.

With larger bodies than 500 a day it becomes difficult to manage properly. I would give no batta for the road, but would provide food and shelter at convenient points, sending some responsible officer in charge of each party. I never have given money to persons discharged from works, nor have I had to deal with those who to the end continued in a physical state in which they were unable to support themselves. We always treated such cases by taking them off the works and putting them into a poor-house.

Mr. J. G. Horsfall.—The laborers left readily enough when good rain fell. Very few lingered on and had to be discharged. Mr. Sewell writes :—"In Trichinopoly I was instrumental in establishing and working a system which seemed to answer well. At intervals of 10 or 12 miles along the principal route that the discharged laborers were to take were established small camps. The officer at the works discharged gangs every day giving them one meal, no money. They were fed at these small camps all along the route to the principal relief camp of their own district, and thence the district officer arranged for their return to their homes."

Clause II.—No.

Major Baynes.—I am of opinion that, under the condition of the famine being over, most of the laborers would discharge themselves, so much so that, as long as any considerable number of persons (not professional laborers) remained on a Class I. work, I should assume that the distress consequent on the famine was not yet removed. I think the best way of settling the matter is to presume that, if they can live in their villages, the majority will certainly go to them; if the work be closed simply on completion and the famine was going on, it would of course be necessary to draft them to another. I should give to laborers returning to their homes on a work being closed the same batta that they received to come to the work.

Mr. Oldham.—My experience has invariably been that the laborers melted away of themselves without any arrangements being made or being necessary for their discharge. In a few instances a few persons, whose physical state incapacitated them from supporting themselves, were left, and these were offered shelter in the relief-houses (institutions which always survive works), and those who accepted it were subsequently discharged under special arrangements, generally with a small donation from charitable funds.

Captain Morris.—Works should be opened within a moderate distance of all, and then it would not be

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Madras.

necessary to give any gratuity to laborers on their being discharged. As long notice as possible should be given on all works, and in the most public manner, of the intention to close them, so that the laborers might be able to save enough to support themselves on their journey home. This, I consider, they could easily do. Special arrangements must be made for those who, when the works are closed, are still unable to support themselves.

Hon. Gajapati Row.—Cultivating classes and field laborers, desert the relief camp sometimes without even giving notice to those that are in charge of the camps soon after they see that a favorable monsoon has set in, and I think they hardly need any assistance when their houses are nearer. But in other cases so much as can meet their requirements in their journey homeward may be granted them. This is seldom adopted at present.

Mysore.

MYSORE.

Major Scott Moncrieff.—If possible numbers ought to be allowed to drop off of themselves. As the famine ends probably some works will be finished, and others need not be opened in their place, the workpeople being offered the alternative of going to works at a distance (see last clause of reply to question 5). If the work closes before the famine does, every effort must be made to start another in its place without a single day's delay. I have no experience of the very end of a famine.

Colonel Johnson.—On piece-work the people would be simply informed that the work is closed, and where those that still require it will find it elsewhere. Those who cannot or will not work I suppose Government would have to go on feeding till they can find some one else to do it for them.

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Question 19.—Desertions from Relief Works. Moving of Bodies of Men to Works over Long Distance.

Has it been found that persons after admission to relief works wilfully desert from them, and to what extent do such desertions commonly indicate excessive severity in the application of tests, insufficiency of food, or improper treatment of other sorts? Are they often due to other causes, and if so, what? How should such results be guarded against? Under what circumstances would you recommend moving bodies of men to works over considerable distances? Should this ever be done as a preventive measure to weed out those who are not in absolute want of relief or only as a step that is expedient for the sake of transferring them from less useful to more useful work, or to admit of their being more easily fed or supervised, or to prevent sickness and the like? If the distance is more than one day's march, what arrangements should be made for hutting them for the night and for paying them or feeding them on the march? Narrate the history of any case within your knowledge in which more than 500 people were moved, or attempted to be moved, more than 20 miles, and state any difficulties the movement involved, and how they might best be avoided.

North-Western Provinces.—Desertions take place, sometimes due to distance test and piece-work. Contractors employed only the able-bodied, and exacted full task, and so gave the works a bad name. Labourers may be moved.

Bengal.—Labourers have been known to desert when piece-work was enforced, at which they did not think they could support themselves, or because supervision was strict. There is no difficulty in moving the people. They will go to work when it is offered.

Bombay.—10 answers. Desertions took place, not from severity of tests or ill-treatment, but caprice, or to get from strict supervision to less strict. As to moving men long distances to weed out those not in want, opinions differ, but the majority think that movements of large bodies long distances should be undertaken with caution, and avoided if possible.

Madras.—27 European and 2 Native gentlemen have replied.

Desertion does occur, and is ascribed to idleness, love of home, separation from relatives, delay in payment of wages, discomfort inseparable from camp life, cholera, rigid enforcement of tasks, and fraudulent treatment by Native officials. Instances are given of transfers of large bodies of labourers long distances without difficulty, and many officers think it unobjectionable when it is desirable to transfer labourers from one work to another, and sometimes to weed out those not in distress. Other officers think such movements are not to be recommended, as being difficult and costly.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Major Jeffreys.—Yes ; wilful desertions are of very frequent occurrence where the distance test is in force and piece-work is exacted. Even moderate severity in application of tests invariably brings this result. When this occurs to a large extent and is not due to absence of distress, it is necessary that the officer in charge should have ample discretion to raise rates or employ daily labour or cowrie work to induce them to stay ; a good deal must depend on the personal influence of this officer and his tact and power of management.

The best plan to prevent wholesale desertions is (1) to avoid application of distance test as much as possible ; (2) to avoid a system of charitable relief in the villages, which makes the people disinclined for any kind of work whatever ; (3) to open out works to all comers far and near ; (4) to employ for earth-carriers the cowrie system, by which a perfectly equitable distribution of wages is secured ; (5) to give full discretionary powers to the officer in charge, subject to condition that he must show a reasonably fair equivalent for the money expended. If it can be shown that the wholesale desertions are due to absence of distress, then the work should be shut up forthwith or be thrown open to contract at ordinary rates.

Mr. Colvin.—They come and go as they please ; and as a rule stick to the works like wax. Only habitual beggars sent in from the towns, &c. desert. These desertions indicate nothing but the depravity of the habitual beggars' nature. This kind can only be cured by easy tasks at first, growing in severity as Lazarus and Dives get confidence in one another ; and in unfailing return by the police of these people to the works, whenever they leave them. They can always be recovered, as they invariably return to the towns, which are swept clear of them every day.

Subsistence allowance on the march was always given when the march was over six miles; 15 miles was a day's march. We never moved over 20 miles. The labourers found their own way. They were paid the subsistence allowance on the evening before they marched, together with their wage for the day that had just closed. No hutting was necessary.

Mr. Sandys.—During the last cold weather if even a fair task-work was exacted, the class of people who usually came to the works, such as juláhás, chamárs, &c., would not complete it, and, being unable thus to earn a bare subsistence in many cases deserted the relief works.

No desertions took place when subsistence wages were given, whether a full task was performed or not.

The weather also was unusually cold and damp, and many of the applicants were insufficiently clad, and no orders were then issued for hutting the labourers, and only half wages were given on rainy days.

The people who resorted to the works had not, as a rule, been accustomed to do any earthwork and were generally unwilling to go any distance in search of it. Moreover, the contractors, instead of persuading all their tenants and the inhabitants of their villages to take work under them, as was hoped would be the case, employed only the able-bodied and demanded a full task from them. As soon as this became known, and the number of weak and feeble persons unprovided for increased, daily labour gangs were started, but the action of the contractors had no doubt given the relief works a bad name. Daily labour gangs only have for some time now been employed and no cases of wilful desertion from them have been brought to notice.

The only cases in which it has been found necessary to send bodies of men to a considerable distance have been when they have come from the neighbourhood where the work is going on, or on the completion of a work, or to secure more efficient supervision. They have not had to be moved on account of any difficulty in obtaining supplies or on account of sickness. When the distance has been more than one day's march, the labourers have either been advanced wages sufficient to enable them to reach the work to which they have been transferred, mates being sent in charge of each gang, or the officer in charge has marched with them and paid them on the way.

Mr. Beahen, Assistant Engineer, brought 2,326 men from Sadullaganj camp to Budaun, a distance of about 20 miles, where he paid the labourers the same evening, and marched them off the next day to camp Kumargaon, nine miles from Budaun, where he paid them in the evening. The movement involved no difficulty. The men camped for the night under topes of trees.

Mr. Tracy.—Persons frequently desert relief works, but I have no reason to ascribe their desertion to any of the causes specified. As far as I have observed, people leave the works when they think they can do better for themselves elsewhere.

It is not advisable to attempt moving bodies of men to distant works, except to prevent sickness.

Mr. Kennedy.—The district engineer moved more than 450 men a distance of 28 miles in two days. The labourers were arranged in gangs of 50, and were headed by their gangsmen; the whole party being in charge of an overseer. They were paid each day at the halting ground by the district engineer. The halting ground on the first day was in the neighbourhood of a town, and on the second day in the vicinity of a large village. The march was successful, chiefly because the labourers had previously fallen into their places when working under these same mates. Each man knew his mate and his gang, and the whole gang was ready to move in one body. The attendance of relief labourers is apt to be precarious, because, if possible, they return to visit their own homes for a short holiday, taking any grain they may have spared to their relations who have stayed behind. Desertions were very common last year on account of the severity of the task imposed and the difficulty of obtaining a subsistence. This year they were much less common.

Mr. Lawrence.—At Agra people did not wilfully desert from the relief works; but they deserted in large numbers from the canal works at Shikohabad, to which they were sent by train.

Bodies of labourers may be moved to works at a considerable distance, both as a preventive measure, to weed out those who are not in absolute want, as, for instance, when the famine is passing off or when the works in the neighbourhood of a large city are crowded by the wives and children of men in other employment. Also to prevent sickness or get them to a better supervised or more useful work, or to relieve a work already overcrowded. If the distance is more than one day's march, at the place where they have to halt a sarai should be hired, or a grove of trees selected. The tahsildar of the pargana in which the halting place is situated should have timely notice of the march, so as to provide sufficient supplies. On arriving at the halting place the labourers should be paid their wages by the overseer in charge, in presence of some official, and allowed to purchase their own supplies. Labourers were in several instances sent from Agra to a distance of over 20 miles, and the arrangements described above were found to work well. At first, difficulty was experienced by labourers deserting after receiving payment on reaching the first stage, and returning to the original work, but this was obviated by the plan of putting a distinctive mark on finger-nail by caustic.

In moving bodies of men it is very necessary to send a sufficient number of water carriers along with them.

Mr. Story.—I do not remember whether there were many desertions from the relief works in 1868–69, but I should say desertions would most commonly be brought about by a combination of the severity of the labour test and insufficient food. It is most difficult to move large numbers of people even a short distance of four or five miles. I know at Jhánsi when we weeded people fit for work out of the poor-house and sent them to relief works, there was often a complaint that numbers of them had run away. In many instances, after wandering about they would return to the poor-house in an exhausted and starved state. The class of people who mostly did this were those not accustomed to out-door work.

Captain Currie.—I have never known people to desert from being overtasked. In one instance, when a work was started without the exaction of a task, a great number fell off as soon as the task-work system was introduced. This was the result of indolence on the part of the people, who thought they were to be supported by indiscriminate charity; there was no severity in the application of tests or improper treatment of any sort. People may be moved in large bodies from one place to another, and there is never any necessity of putting them on the road if the journey be even more than a day's march. At the end of each day's march they would be paid a day's wages, as if they had been at work. We have never had occasion to move so many as 500 at one time.

CH. III. QN. 19.

BENGAL.

BENGAL.

Mr. Magrath.—The only instance of desertion which came to my notice was the desertion *en masse* of 20,000 men, because a system of piece-work was introduced by which they were unable to obtain sufficient nourishment to keep them from gradually starving. Rather than slowly starve they laid themselves down to die at once, and but for the fact that I speedily got Sir Richard Temple to the spot, and that the orders were relaxed, they would have died in great numbers. On this they returned, but in such a condition that many of them were unable to do more than half a day's work. Such desertions can only be due to folly or worse on the part of the Government or its officials, and I cannot suggest safeguards against results which never occur except where doctrinaire systems are forced on without consideration as to the practicability of carrying them out.

To attempt to move large bodies of men would be childish. You cannot keep them together without vast armies of soldiers or police. Let the people know where they will get work and they will go 50 miles to it. Even the Nepalies found their way down in large numbers early in the famine of 1874 to works in Durbhunga, and when the works in Goruckpore were hastily closed by the North-Western Government, the people with no means of subsistence passed over to the works in Chupra, often very many miles from their homes. I consider any arrangements for marching them in a body utterly wasteful, and also likely to frustrate its purpose by leading them to desert; whereas they will willingly go to the works of themselves, and if told that at any particular work there is no room for them they will move on.

I do not see that it would necessarily weed out those not absolutely in want of relief, and as none but really useful works should ever be started, I do not recognize any grades of more or less useful works. In the rains, or rather in the absence of rain, when we wanted bunds made, we closed all the other works near, and the people came to the bunds at once. Hutting or paying them on the march would only be an unnecessary expense. Give them an advance of one day's pay and they would go as far as you are likely to require them, carrying their food along with them. In no case that I know of was a body of more than 500 people attempted to be moved in a body 20 miles, and I should be sorry to try and make any such futile experiment. The people are very childish, and though easily led are very difficult to drive, and begin to suspect that they are to be forced to emigrate, or even are going to be used as victims for human sacrifice.

Mr. Metcalfe.—It has been found that persons after admission wilfully desert from relief works. In Behar, when petty works were numerous, labourers left frequently one work for another, sometimes owing to quarrels with the overseers in charge, at other times when piece-work was enforced in place of daily payments. If the officer in charge of the work was a hard taskmaster, or even insisted upon an honest day's labour, the malingerers amongst the workmen would move elsewhere and try their luck on some other work.

I can conceive no difficulty in moving a body of men from one work to another, whatever be the distance. The coolies would carry their grain with them if the intervening country is a famine tract. An officer would accompany them, and grain would be served out at the close of the day's march. No hutting for the night would be required: a year of famine is necessarily a year of drought, and natives can well camp out at night in dry weather.

BOMBAY.

BOMBAY.

General Wilkins.—At the commencement of a famine people admitted on relief works constantly deserted from them. Such desertions indicated on the part of the people—

1st.—A desire to better themselves.

2nd.—A desire to unite with friends.

3rd.—A desire to escape the severity of task work.

4th.—A desire on the part of emigrants to return homewards.

Bodies of men should only be moved over considerable distances when it is desired to close small works and to relegate the people to large works; also at the termination of a famine to accelerate their closure.

The people should be sent in charge of their muccadums and karkoons, and be paid by the way. No hutting is necessary, at least in the Southern Division, as the villages are numerous and accommodation sufficient.

There is no difficulty in moving the people if they require relief.

Large bodies were relegated to the Begum tank near Bijapur, and to the Gokak Canal, thirty miles from Belgaum, from the general works in the Kaladgi district. This took place at the close of the famine. The people sent did not arrive; they melted away from those in charge of them. The famine was over.

Mr. Norman.—Persons admitted to a relief work are continually in the habit of deserting from it. During the last famine this went on to a very large extent, when the labourers were transferred from Civil to Public Works Agency works, the reason being that the supervision was stricter and the work exacted more severe on the latter than on the former class of works. As a general rule, when the orders of Government came to be fully understood, I do not think that the tests exacted on works under Public Works officers were too severe. In a few instances in the early part of the famine this may have been the case. This can only be guarded against by a strict observance of rules. Persons usually desert because they dislike leaving their homes, and they object to the scanty fare, hard work, and indifferent shelter which they have to put up with at the camps.

As a general rule, I do not think persons should be transferred over considerable distances for the purpose of weeding out those who are not in absolute want. But few of the latter class are to be found on the works, and they yield a fair return for the scanty wages they receive. If the distance to be traversed is more than one day's march, the labourers should be moved in small bodies. Accommodation can thus usually be provided for them in dharamshalas and empty houses, and arrangements must be made with the village officers at the halting places to provide them with food. This system was adopted during the last famine and answered fairly well. I know of one case in which upwards of 500 men were moved from the Mutha Canal to the Nira Canal, about 30 miles, towards the end of the famine. Many deserted on the road, but a large number reached their destination. No great difficulties were experienced. Most of those who deserted probably returned to their homes, and the remainder joined some other work.

Mr. Spry.—People did sometimes desert from relief works, but from inquiries I could make I did not discover that their desertion arose from excessive application of tests, insufficiency of food, or improper treatment. The task tests were more efficiently exacted under the Irrigation Department than under the ordinary Public Works Department, and desertions from the works under the former Department took place in the hope of getting on to works under the latter. In one instance a large body of people came to me off a work, complaining of the task test. I found that they objected to any task at all, and that they had been instigated by their muccadums and mustering karkuns. I at once dismissed these muccadums and karkuns, and debarred them from further employment. The body of the people then returned to their works, and I never heard any more complaints. Desertions and strikes are almost invariably instigated by the muccadums, &c., and the dismissal of these soon brings the people to their senses.

I would always recommend the moving of bodies of labourers to considerable distances, wherever it was expedient either to weed out those who should not be on works or to transfer them to other works for any cause whatsoever. If the idea got about that such moves should not take place, all management would at once cease.

No arrangements are necessary for hutting people at night when on such marches. All such people are quite accustomed in ordinary times to spending their nights in their fields or elsewhere; and I do not see that extra care is required for them during a famine. They are quite up to rigging up tents out of their blankets. As regards payments during the march, they should be moved the day after their weekly pay-day, and then they will be in funds to carry them on their journey. Most probably the shopkeepers who supply them will accompany them; or if not, notice can be sent on to the villages *en route* that so many people may be expected on such and such days. Moves like this were continually made in this district without any disorder or inconvenience. I remember one case where I saw 2,000 people on a road work transferred to a tank work more than 20 miles off. They started in batches of 1,000 each, and after a two days' march arrived quite happily. I do not see what difficulties there are in such movements, so I cannot state how they are to be avoided.

Mr. Charles.—About 2,000 people were attempted to be moved towards the close of the famine from the Bankapur works to Kalghatgi, more than 20 miles.

The difficulty was to prevent straggling and desertion, and as a fact a very large number did desert. Nothing short of a strict police guard could have prevented this, as the overseers and makadams are quite unable to look after so many.

Mr. Moore.—Desertions have been very exceptional. Bodies of men should be moved when it is expedient to transfer them from less useful to more useful work or to prevent sickness. I have moved bodies of men 70 and 80 miles in charge of police and revenue peons and a mamledar's karkun. I cannot say how many men exactly without reference to records, which are not with me, but not more than 60 or 70 people at a time. They started with cooked bread for the journey, and if necessary to cook fresh bread on the way, sufficient flour was sent with them, and the karkun and sepoys saw it cooked and fairly distributed.

Mr. Hamilton.—In cases where people were transferred from one work to another, subsistence allowance for the days occupied in travelling was given at the end of their journey. Ten miles a day is an average journey in this district for a whole family.

Mr. Percival.—The reasons given for leaving work are endless. If many persons leave, the revenue officers will hear the reasons alleged, and if necessary let the officer in charge know. The only objection to moving a large number of persons to a distance is that they will not go. It is not difficult to organize the march of a party, even though they have to take food for the road with them. A responsible person and some police must go with them to keep order and prevent difficulties. They will sleep out at night and carry their bundles and tools. Probably as many as 500 should not march in one party; 300 at a time would be more manageable.

Colonel Anderson.—Desertion was not uncommon. Restlessness and wandering habits a common cause, without other adequate reason. I heard of one relief work in Canara becoming unpopular because the people of it were required to be in their quarters and out of the town after 9 at night, and to abstain from tom-toming in their quarters after the same time. It is difficult to see how desertion from relief works could be guarded against, as it would be difficult, if not impossible, to discriminate between persons who had left from legitimate reasons and those who had left from mere restlessness with no proper means or plan for obtaining a subsistence elsewhere. Men may be properly moved to some distance towards the end of a famine to induce the voluntary lessening of numbers; they may certainly also be moved to utilize their services better. But great care should be exercised during the time of pressure in moving large bodies far; it may tend to their abandoning the works and spreading through the country, giving much trouble to reclaim them when fallen into bad condition. Two days' journey or 30 miles is as far as can be well managed. A move in threatening weather should be avoided or the people moved in batches of a few hundreds, who could get shelter, if need occurred, at a village on the way. Provision for halting *en route* is out of the question. The people, if living on works, would always have the means of supporting themselves for a couple of days without special provision.

In Kaladgi last October the labour gangs on roads in the east of the Collectorate, over 50,000 in number, were paid off in the middle of September and told to go, if they wanted work, to a tank at Bijapur, or a tank in the north of the Collectorate, or to the Gokak works, all distances over 30 miles for the large majority of the people. Very few went, and those few soon left. There was reason to believe that numbers were on the roads, who did not need to be there longer, as rain had fallen plentifully, and agricultural operations had commenced to revive, and that only those who really required work would accept the move. This was true as regarded the large majority, but some proportion, possibly ten to twenty per cent., did require work still. The tank works were unpopular for one undoubted reason, that stricter supervision was reported to be imposed than was practicable on scattered road works. False reports, too, of cholera on the tank works were set afloat by interested persons, karkoons and muccadums employed on the closed road works. It was evident that, whatever the people might do, they had no intention of going to the tank works. Some might go to their homes and find means of support there, and some would wander about in a purposeless way, looking for means of support, but without any definite object in view; consequently search was made for people wandering about without work, and villages were examined with increased strictness, and all people appearing really needy and asking for work were employed on relief wages for a week or two, when, with the continued improvement in the season, they all—or nearly all—dispersed to their homes. It is evident that while a famine is in its intensity serious difficulty might result from attempting to move the people in large bodies to works which for any reason, good or bad, are unpopular. Still it may happen that such a move must be made, in which case the greatest vigilance in the country on the flanks of the line of movement would be necessary to reclaim people wandering away without means of subsistence before they allowed themselves to get into such low condition that their speedy recovery would be a matter of difficulty.

Mr. Robertson.—Yes, people do desert largely from relief works, often for no apparent reason whatever, often because they do not like the locality, because they have been on some light Civil Agency work, and do not like a task as required under the Public Works Department. A case or two of cholera will drive many away. The tank work at Ashti in the Sholapur district is one that was notably unpopular. Yet, after inquiry made, no particular reason could be given. Probably the officer in charge was strict, but he most certainly was not severe.

As a rule I am averse to moving bodies of men to a considerable distance. It will certainly drive away those who ought not to be on a work and are not in absolute want of relief. I consider that proper and constant mustering of the people by the district officers on all works, both those under the Public Works Department and under the Civil Agency, will effect this far better, while the distance test also ensures those who ought not to be on the works being kept away. If you desire to move men to a more useful work, this can only be done gradually. I can confidently affirm, from much experience, that they will not go to any *very considerable* distance. I made repeated efforts to send men from Sholapur and parts of Poona to the Dhond and Manmad Railway works, but they *would* not go. Repeated attempts were made to send men from the Sangola and Malsiras talukas in Sholapur to the Nira Canal works, and they would not go. On one occasion I sent a body of 500 men under a party of police from Karmala and Malsiras to the Nira Canal works. They had then grain with them. Only a few arrived, the rest having deserted on the road, and those who arrived, I learnt on a subsequent visit to the Nira works, had after a few days deserted the works, not liking to be so far distant from their own district. I consider the difficulties, as regards the removal of large bodies to a considerable distance, are so great as to render any attempt at such a step in every way most undesirable.

Mr. Bosanquet.—On this subject the Executive Engineers will be able to give more accurate information than I can. I have already expressed my opinion that many persons were deterred from accepting work on account of the insufficient wages allowed. The same cause no doubt operated in leading persons really in need of assistance to leave the works in order to try their chance of getting a precarious subsistence by begging and by feeding on leaves and roots. There may be occasions when it is necessary to draft men from one work to another, but it would be well if arrangements could be made that the distances travelled should not be great. Such occasions should not, I think, be sought simply in the hope that the labourers will desert on account of the distance of the new work. In case of an epidemic breaking out on a work, there would, I suppose, often be no resource but to close it. The only feasible way of transferring labourers from one work to another is by placing them in charge of some person whose duty it will be to pay them daily. During a great part of the year there need be no difficulty about hutting. I know of no case in which more than 500 people were moved or attempted to be moved at one time from or to a Civil Agency work.

No civil officers were in this district associated with officers of the Public Works Department in supervising relief works, and it does not appear necessary for me to say anything on this subject, except that I am not aware of any advantage to be obtained by such an arrangement.

MADRAS.

MADRAS.

Sir W. R. Robinson.—Moving large bodies of men, women, and children with safety over considerable distances is at any time difficult and perilous in India, as we know from moving even one regiment with its women and children—many provisions and appliances notwithstanding. Moving masses of famine-stricken creatures in drought, famine, and decline of strength under great climatic and other disadvantages (want of shelter, &c.,) is so obviously disastrous that it should be avoided in every interest so far as possible. The attempt to induce some 50,000 persons dependent on daily labor who were struck off relief in Kurnool, Bellary, and Cuddapah about the middle of May 1877, to the Nellore canal at the height of the famine, was simply a serious *fiasco*. The rejection of large numbers from district works in Bellary in order that they might assemble on the Bellary and Darwar railway works was at first an eminently unsatisfactory measure, and so on.

Mr. Longley.—It has been found that persons after admission to relief-works wilfully desert them. Those desertions have partly been due to demoralization of the cooly classes, who hate restraint of all kinds and have been seized by the spirit of wandering, but they have also been due to severity in the application of tests and to insufficiency of food, the result of being left unpaid for a week or even more. Such results can only be guarded against by a sufficiency of European supervision in the Department of Public Works by providing paymasters or cashiers in greater numbers and by subordinating all officials in the Department of Public Works to the civil officers in matters not strictly professional.

Bodies of men should not be moved over considerable distances to works unless works of utility *cannot be opened at a less distance.*

To weed out persons not in absolute need of relief the application of the distance test of ten miles as a preventive measure is ample. Any distance too great to be traversed back and forwards in the same day is efficient as a distance test. Coolies may have to be moved, because no work of utility is in progress close at hand, because the locality is unhealthy, because drinking water is deficient or unwholesome, because supplies are difficult to obtain in sufficient quantities; but for the mere purpose of a distance test ten or even five miles from his native village will prevent any cooly—a not fit subject for relief—from obtaining it on a work.

Where the distance is more than ten miles, which I take as equal to one day's march, shelter for large bodies must be provided *en route*. A bazaar should also be provided at each halting-place, so that coolies may expend their subsistence money. In my experience, not only has no such provision ever been made for coolies *en route*, but even when settled on a civil agency work the Department of Public Works have not always made provision for housing the coolies in their charge. Hence the continued ebb and flow between works and camps. Where only small bodies of coolies are moved, they may get along without special accommodation on the route, that to be found in villages by the way sufficing, but in all cases some one should accompany them to pay them their subsistence allowance daily; with a larger advance they would probably abscond and only turn up again when it was spent, or spend it all in one day, and come begging for more the next.

The following is from the head assistant collector Mr. LeFanu's division:—

At the end of 1877 a batch of about 300 coolies were transferred from Kallavi, a village in the Uttankarai Taluk, where they were employed on tanks, to Harur, another village in the same taluk, a distance of twenty-four miles if not more. From Harur the greater portion were transferred within a week to the Moropur-Makanur road, a distance of eight miles, and from the last-named road the able-bodied of them were selected and transferred to the Alapuram tank, a distance, *viâ* Harur, of twenty miles, so that within the short space of one month they were subjected to three transfers covering a distance of fifty-two miles.

At Kallavi I do not think any hutting accommodation was then provided for the coolies; at Harur they had none; and on Morapur-Makanur road they had not even the protection of an avenue.

This year another batch of 500 coolies were transferred from the Harur road to the Makanur road, a distance of eight miles, without any huts having been previously provided for them, and, as I have already said, the road has no avenue. Several of the coolies had to take shelter at night in the back verandah of the railway station at Morapur. The transfer was made at the latter end of June, and not till the middle of August were any huts provided, and then only seven small ones for 500 coolies. I have just* received information that, almost all the coolies employed on the Morapur and Uttankarai roads are now being transferred to the Vaniar project, the distance in the former being 21 miles, and in the latter 24. The able-bodied working at the Vaniar were a month ago transferred from the Vaniar project to the Barur project in the Krishnagiri taluk, a distance of some 36 miles.

These transfers which are the most noticeable among the many that fell under my observation resulted, in each instance, in desertion on the part of several of the coolies, and clearly indicated excessive severity in the application of the test. In separating the able-bodied from the weakly, the duty was almost in all cases assigned to a native overseer, who carried it out arbitrarily and separated families.

Mr. Price.—I had the moving, as far as the Nellore frontier, of the whole of the coolies sent from the Bellary and Cuddapah districts to the Buckingham canal. I cannot recollect the precise figure, but I believe that the total was between 40,000 and 50,000. We arranged as indicated above, and the main inconvenience which we experienced was in the people being crowded upon us too rapidly. With parties of 500 we could manage well enough at all the halting-places; but as we had calculated upon only 500 a day, there was not a large enough staff, and until we put on extra men the coolies did not receive their allowance in time to permit of their making themselves comfortable. In a very short time, however, things settled down and we carried on the work without any serious hitch, except an outbreak of cholera which compelled us to alter one of our lines. There were two routes by which the coolies marched—one for those of the greater portion of the district, and the other for those from Bellary who were sent to us by rail and forwarded from our receiving station. We had one or two parties larger than 500 accompanied by an European officer, but I believe that those escorted by a native maistry were just as well looked after. The cholera and desertion were our principal troubles. There ought to have been more medical aid, but it was not available. Mismanagement, real or alleged, at the canal and over our border caused very many persons to return, and they, meeting those who were coming, spread all manner of stories and it was impossible to prevent a large number of the intending emigrants making off. I would have formed depôts at Cuddapah and Wontimetta which were our receiving points. In fact I began one at the former place, but cholera broke out so violently just at the time that we were compelled to break it up. Depôts at central spots would, I think, prevent crowding on the line of march and things would then go smoothly enough.

Mr. Grose.—I do not think people should ever be moved over distances to "weed" them; causes like those mentioned, viz., the prevention of sickness and the like may be sufficient. Generally, it will be best to give the paupers batta for the march and let them go. If they are very numerous, however, they must have a sufficient amount of grain doled out to them at the end of each day's march. If they get more than enough for one day a number are sure to desert.

Large numbers of paupers were sent from Bellary, Cuddapah, and Kurnool to the Buckingham canal. They passed through the district by four stated routes, and there were stages on each where a stock of Government grain and condiments were provided, and they were entitled to a supply. Huts were erected, but they always preferred camping under trees or in any village that happened to be near. When, as in the north, grain batta was given for several days at a time, they decamped in very large numbers. Only a small proportion of those who left the three districts I have named reached the canal, and when they got there they proved idle and troublesome. Some bodies brought cholera with them. European officers came in charge of some. I am strongly of opinion that this *quasi*-forcible deportation of unwilling laborers from one district to another cannot be successful.

Major Baynes.—Persons who have been DRIVEN to a work will naturally desert, but I do not attribute all desertions to this fact; for many I know when once got there in health, if kindly treated, and *regularly paid*, get to like the life; there are several powerful agents at work which cause desertion—natural idleness, love of home, separation from relatives, desire of change, discomfort inseparable from camp life, rigid enforcement of the task system, and cruel treatment at the hands of the native officials.

Mr. Oldham.—It is the commonest thing for persons in urgent want of relief to desert relief-works after admission to them. The most frequent causes are the want of special arrangements and special treatment for new comers, taskwork being required from laborers not accustomed to render it, and wages not being paid daily. Apart from these, such desertions do not necessarily indicate improper treatment on the works. It is not uncommon for a few factious persons, probably not altogether without resources, to draw with them a crowd of ignorant laborers, old people, women and children, who are in emergent need of relief, and there have been frequent instances of reasonless panic. Last year, day after day, bands of 100 to 200 laborers were carried from Adoni to Bellary, 66 miles by rail, and then marched 10 or 20 miles to the working-sites on the Bellary-Hubli railway, only to scatter and run away and wander back to Adoni, sometimes when within a few yards of and without even seeing the work they had to do. On questioning one band of these people as to the reason for their deserting they unanimously clamoured in reply: "They take twelve yards for the rupee." I could not ascertain that any one of them understood what quantity of work this very moderate demand represented, or even how much a single yard was. It appeared to be a mere parrot cry, the very utterance of which frightened them away.

The circumstances under which it is desirable to move large bodies of laborers to considerable distances have been alluded to in my answer on paragraph 5 (the distance test). I have frequently marched thousands of people distances of over 30 miles, and without the slightest difficulty. The last instance was in October 1877, when about 10,000 residents of the Kurnool district, who had taken refuge on the Adoni relief-works, were marched a distance of 35 miles from the work on which they were collected into the Kurnool district and made over to the authorities there. Not one of these persons was in ordinary good condition while most of them were excessively enfeebled and emaciated, some of them so much so that they had to be conveyed on carts. No difficulty attended the transfer nevertheless. No hutting arrangements could be made for them, but five stages were fixed, on an average seven miles apart, at which there were villages. The weather was rainy but the stages were reached early and the people had time to provide for their shelter. They marched in their working-gangs, with the gangsmen, gang-writers, paymasters, and superintendents described in the answer on paragraphs 16 and 17. They were paid daily and were accompanied by the grain-vendors who used to keep shops and stalls on the work on which they had

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been collected. They were followed by a small rear guard of police (a head constable and four men) with a few litters (bamboo ladders) and bearers, and a few carts as ambulances. The superintendents and the police returned over the route they had traversed and reported that there had not been a single casualty. The first 14 miles of the march were along a high road, the rest across country.

Captain Morris.—It was found that many persons left the works after admission. The distance test, which it was found necessary to apply, caused the greatest number of desertions; there was no other cause for them, so far as I could ascertain, at least I had no complaints, except about the Sunday wage, and on this subject I was besieged with complaints whenever I visited the works.

MYSORE.

MYSORE.

Major Scott Moncrieff.—Desertions are frequent, and are often due to the stupid mistakes of Public Works officers and subordinates who cannot realize the situation and are needlessly severe and exacting. They are due to other causes too, chiefly the irradicable tendency to rove on the part of some of the poorer classes, who in a famine season are among the first to suffer. They have lived all their days from hand to mouth, never doing a good day's work. It is hard to make them do it now. If the police are trustworthy and efficient they should co-operate to prevent this.

As I have before written, I object strongly to the distance test as a means of weeding out those not in want. But it will often be expedient to remove from less useful to more useful works, or from a sickly place, or one where the water supply is bad, to another. If possible the coolies should be during the march confined every night in a suitable village enclosure. A trader should sell his food within this enclosure, and they should be allowed to go out for water, a few at a time. They should be paid daily during the march. In January 1878 over 3,000 coolies were successfully marched for a distance of about 26 miles from an unimportant district road, where they were breaking metal in the Toomkoor District of Mysore to work on a main trunk road. They were moved in three detachments, the deputy commissioner, the civil relief officer, and the Public Works officers, all being present. The two Public Works subordinates had so won their confidence that they were quite content to stop on and work with them on their new road. The journey was made in two days and they were paid daily.

Mr. Ricketts.—Yes; persons do so wilfully desert, and severity, insufficiency of food, or improper treatment are not commonly the causes, but mainly a vagrant spirit, a wish to try their luck elsewhere, also a vagabond disposition seeking to idle, beg, or steal, in large towns, and then to be sent back to work at the expense of the State. Police action can guard somewhat against such results; but after a time there arises the fear that disgusted and annoyed at repeated deportations and desertions ill-usage may be resorted to as a remedy. This is a great difficulty now experienced at the railway works, and apparently the only effectual remedy is a short legislative enactment authorizing summary trial by a magistrate or bench of magistrates and the infliction of stripes if the habitual deserter failed to show cause for the last desertion on which he was brought up. Even hard labour might be imposed, but it must be labour on the relief work itself and not in jails, which are overcrowded at such times.

I would not recommend moving bodies of men to works over considerable distances as a preventive measure to weed out those who are not in absolute want of relief; but it could, and sometimes should, be done for the purpose of transferring them from less useful to more useful work, or to admit of more easy feeding and supervision, or to prevent sickness and the like.

In some places it is difficult to find a suitable large work and then the physically weak, the emaciated, nursing mothers and children, &c., should be kept on small works, calculated to give employment to a few for some months and all others; which would mainly imply the able-bodied, or comparatively so, should be excluded and told to go to the nearest large work.

Colonel Johnson.—The question will no doubt be more fully answered by others. So far as I know, desertions do not so much indicate excessive severity or improper treatment on the works from which the people desert as excessive leniency and improper extravagance on others, and the hope thereby induced that by deserting one work for another the coolies will better themselves. I do not think the charges of severity or improper treatment could be made against the management of a single relief work in Mysore, but I believe desertions were common enough. The best way of guarding against such results is to foster in every way possible a spirit of independence and self-reliance amongst the people, by the adoption, amongst other things, of piece-work in preference to the debasing cooly driving system to prevent relief camps, or the works for incapables being made more attractive than able-bodied relief works. This may be done by insisting on much more rigid discipline, by confining the people to their camp, by devising a deterrent system of punishment for habitual deserters, &c., &c.

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QUESTION 20.—ASSOCIATION OF CIVIL OFFICER WITH PUBLIC WORKS OFFICER ON RELIEF WORK.

Under what circumstances should a Civil officer be associated with a Public Works Department officer in the management of a relief-work? What is the proper field of duties of the Civil officer? What parts of the duties should be wholly under him, and what parts should be entirely beyond his sphere? If it is proper for him in any way to interfere with or control the discipline of the labourers, the management of the camp and bazaar, the tasking, the measuring, and the payment of wages, state how this can best be done without undue friction and annoyance.

Punjab.—Opinions, where expressed, generally similar, but the civil officers seem hardly to have considered the question.

North-Western Provinces.—Generally similar.

Bengal.—Ditto.

Bombay.—10 answers. The majority hold that a civil officer should be associated with a P. W. D. officer on every large work, the former supplying the labourers whom the latter employs. That P. W. D. officer would have entire control of tasking, measuring, and paying. The civil officer would manage poor-houses, hospitals, and bazaars, pas labourers on to the works, and transfer them from the P. W. D. to civil works or hospital. The two officers with the medical officer might join in ganging the applicants.

Madras.—25 European and 1 Native replies.

Opinion is not unanimous but a majority think that the civil officer should supply the labourers on works, and look after the bazaar, hospital, and perhaps payment, while the Public Works Department officer should undertake the tasking, measuring, and other professional functions.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Captain Marshall.—The discipline of the labourers, of the management of the camp and bazaar, and the sanitary arrangements, might be under the Civil officer; but the tasking, the measuring, and the payment of the wages should be exclusively under the control of the Public Works officer, acting of course under the instructions laid down by Government.

Mr. Colvin.—When numbers make the Department Public Works staff insufficient, or local difficulties arise, we have always used Civil officers when organising or administrative needs suggested it, as apart from mere departmental mustering, measurement, and payment. All this again depends on the men. But the broad line is—the Department Public Works officer for the work and the payment; the Civil officer for the accessary arrangements.

Mr. Sandys.—The Civil officer's duties in this district might be confined to seeing that a sufficient number of works were started to give employment to all who required it before they became too weak to perform any work; that proper arrangements were made for the shelter, in case of bad weather, of labourers who had not been hutted; that wholesome food was sold at fair rates by the shopkeepers of the bazaar, and that the bazaar was well supplied. The maintenance of discipline among the labourers, the management of the camp, the tasking, measuring, and payment of wages should on any work likely ever to be carried out in this district be left in the hands of the Public Works Department officers, as the Civil staff is never likely to be strong enough to undertake any of these duties at a time when their own ordinary duties are much heavier than usual.

Mr. Lawrence.—In all cases, if possible, a Civil officer should be associated with a Public Works officer in the management of relief works during the height and decline of a famine.

The admission and discharge of labourers, fixing the rate of wages with reference to prices, payment of wages, and grading the labourers according to their strength, should be left to the Civil officer. The Civil authorities should also be consulted regarding the work to be undertaken. All details in regard to the carrying out of the work, and the provisions of tools and plant, should be left to the Public Works Department. The preservation of discipline, the management of camp and bazaar, should be in the hand of the Public Works officials, who would receive all necessary aid from the civil officers. If the above division of duties be clearly laid down to start with, there need not be any friction.

Major Jeffreys.—His duties will be to exercise a general check and to bring to notice any abuses that may arise. Especially it would be his business to find out the causes of general and wholesale desertions—whether due to unusual severity in enforcing piece-work, or to mismanagement or to absence of real distress. The Commissioner would look to him for a full and complete explanation on all these points, and on his report a local committee should be appointed to make the investigation spoken of in my remarks on para. 19. He should have nothing to do with the technical part of the work, the control or discipline of the labourers, or the distribution of wages or task-money; but it would be his duty to inquire into all these points, to investigate the composition of the working parties, their caste and previous occupations, as such inquiries would throw much light on the ability or otherwise of the gangs to perform the allotted tasks.

It would be his business to record his opinions on these matters and to give his advice to the local Public Works officer. The camp and bazaar, however, would be his special province, and these should be entirely under him.

Captain Home, R.E.—I do not think that a Civil officer should be permanently associated with a Public Works officer in the management of a relief work, but at the commencement of a large relief work the presence of a Civil officer would be most desirable, and would strengthen the hands of the Public Works officer materially. His advice on many points in connection with the relief camp, would be most valuable, and his assistance would be needed in matters of police, conservancy, and supplies.

When the work has been fairly started, the civil officer should confine himself to periodical inspections; he should draw the attention of the Public Works officer to any defects which he may notice, and should arrange in consultation with that officer for their rectification.

Mr. Bathe.—The Civil officer should be the controlling head, and the engineer officer should work in immediate subordination to him with respect to all duties excepting engineering details. For the latter part of the engineer duties, he (the engineer) should be under the immediate control of higher engineering authority. By engineering details I mean the laying out of the works, and their thorough execution according to engineering principles. The tasking and paying should be subject to the control of the Civil officer; for I fully believe that there is positively a tendency to save Government money at the expense of the workpeople on the part of the engineer, in order to be able to furnish satisfactory "nakshás" or weekly returns of expenditure showing a minimum of expenditure for a maximum of work. The people are consequently dissatisfied. This is one of the principal parts of the administration which requires the scrutiny of the Civil local officer.

BENGAL.

Bengal.

Captain May.—I think it would be best to place the discipline of the labourers, management of the bazaar, and sanitary arrangements entirely under the civil officer, and the tasking, measuring, payment of wages, &c. entirely under the Public Works officer. Distinct rules like these is perhaps the best way of preventing friction and annoyance in cases where officers do not happen to hit it off.

BOMBAY.

Mr. Hart.—In all large works used as relief labour centres, and wherever there is a relief camp of (say) over one thousand inmates, a civil officer should be associated with the Public Works officers.

General Wilkins.—Civil officers should not be associated with Public Works officers in the management of relief-works. Such an organisation should be avoided. It is a bad plan to mix up officers of different departments in the performance of one and the same duty.

The duties of the civil officers are, when properly defined, onerous enough, and amply sufficient to engage all their attention and activity. They are in my view as follows:—

1st. To thoroughly investigate the condition of the people within the range of their authority. This can only be accomplished by district visitation.

2nd. To learn the numbers of families and the population of every village.

3rd. To become personally acquainted with every district official of the Civil Departments—Revenue, Judicial, Medical, and Police.

4th. To inaugurate the establishment of central poor-houses, and to supervise their management closely.

5th. To inaugurate the village relief works for the semi-able-bodied unable to leave their villages, and to supervise their management.

6th. To inaugurate and supervise central hospitals.

7th. To place village inspection on a sufficient basis, and to see that these most necessary inspections are regularly and efficiently performed.

8th. To investigate the circumstances of all seeking relief on relief works of all kinds. To grant passes to those who are able to work on public works, and their families. To send the less able-bodied to the village works.

9th. To investigate the cases of all wanderers and immigrants.

Mr. Propert.—This is a question concerning which I hold a very decided opinion. I consider that every extensive relief work should have its civil officer, and I would make that officer responsible for everything except mere labour, with which he should have nothing whatever to do. He should most certainly undertake the management of the camp and bazaar and the control of the labourers when not actually engaged in work. The tasking, measuring, and the payment of wages do not in my opinion concern the civil officer. I do not anticipate friction or annoyance, if a relief work be placed in general charge of a civil officer. The duties of a Public Works officer would be to carry out a certain project by means of labourers sent to him by the civil officer. He should treat these labourers as far as possible in the same manner as though they had come to the works from their own villages of their own free will. They would be under him and his subordinates during the hours of labour, and would be paid and fined, &c., as upon an ordinary public work in an ordinary season.

After work hours the Public Works officer should have nothing to do with the labourers, who would then revert to the authority of the civil officer.

Mr. Norman.—It is always advantageous that a civil officer should be associated with a Public Works officer in the management of a relief work. The proper field of a civil officer's duties is to pass applicants for work on to the works, to listen to and investigate all complaints, to supervise the poor-houses which should be attached to every large work for the support of the very old, cripples, &c., who may have relations on the works. He should not interfere with the control or discipline of the labourers, but if he consider that the task exacted is too high, he should bring the same to the notice of superior authority. He should narrowly watch the condition of the labourers, and if any appear to fall off in condition, they should be taken out of the regular gangs, and placed in special gangs where no task is exacted and the wages are less. Persons in a badly emaciated condition must be relieved of work altogether and specially treated. The management of the bazaar should be under the civil officer, who should also give his advice on all matters in connexion with the arrangement of the camp. He should also look after the hospital, issue of clothes, &c., and pay special attention to the condition of the children.

Mr. Spry.—I think that on every really large work there should be a civil officer associated with a Public Works officer. Their duties can and should be quite distinct, and there need be no friction. When applicants come, the two together should, with the assistance of the medical officer, sort them into able-bodied and less able-bodied. The Public Works officer would then assign to them their tasks, &c., and in fact would look after the labourers when on the work, and see to their payments, &c. The civil officer would on the other hand see to the labourers when not at work; he would look to the sanitary arrangements, the relief camp, the bazaar, the hospital, the treatment of the relatives, &c. of those on work who are unable to work, &c. Each officer in his own particular line would have quite enough to do. The civil officer can much better do what is assigned to him than the Public Works officer can, and *vice versâ*. Confusion and disorder have generally occurred when officers have gone beyond their proper sphere. It is only necessary to have clear and specific rules as to the duties of each. If friction then occurs, it will be the fault of individuals and not of the system.

Mr. Charles.—There should be a civil officer near every Public Works Department work. His duties should be confined to seeing that all who applied got work; to settling who were fit to go on Public Works Department works, who to civil works, and who poor-houses; to occasional inspections of the labourers. I do not think the civil officer should have anything to do with measurements, taking roll-calls of particular parties, or should interfere with the Public Works Department officer in any way unless he thought that the health of the labourers was unduly suffering. On the other hand, I think he should have full power to transfer labourers from civil to Public Works Department works, or *vice versâ*, and should also be listened to by the Public Works Department officer as to complaints made by villagers and others about the conduct of labourers or establishment, damage done to crops and fields, &c.

Mr. Moore.—On a reference to Government, it was decided that the *entire* management of large relief works should be under the Public Works Department officers, and this has been strictly carried out except as regards the grain supply. My idea is, that the entire arrangements should be under the civil authorities, and that the Public Works Department officers should attend merely to the execution of the work.

Mr. Percival.—Under no circumstances should a civil officer interfere in the management of a relief work under the Public Works Department. His duty is to see that people able to work and wanting work are sent to the right place and provided with food, if necessary, till they are handed over to the Public Works officer in charge of the work. The bazaar and the poor-house will be under him, but not the labourers nor their camp.

Colonel Anderson.—In all very large relief centres a civil officer should be associated with a Department Public Works officer. Professional duties should be entirely beyond his control or interference, but for all general management he should be responsible.

Mr. Robertson.—Whenever a work is a very large one, capable of employing upwards of 10,000 labourers, a civil officer ought to be associated with the Public Works officer on the work. The civil officer, in addition to his duties at the work, could take charge of a tract of country or circle of villages around the work.

As large bodies of applicants for work would naturally be attracted to the work, he could then receive and examine and give them passes of admission. He should, as often as possible, muster the people, note their condition, and report regarding it, remove all who have irregularly got on to the work, carry on the magisterial duties, see that the sanitary arrangements are such as they should be, and in fact carry on all work not connected with the professional duty of the Public Works officer.

Near all such works it is most advisable to have a relief camp for the infirm, aged, &c. This would be under the supervision of the civil officer, aided by a medical officer, and he should manage the bazaar. He must never interfere with the professional work, and the engineer should not interfere with the management of the camp, the discipline of the labourers, the payment of wages, or the tasking, except when he finds on examining the people in gangs that they are falling off in condition, and there are complaints of overtasking; then he should give the Public Works officer his opinion in writing, if he considers the task is affecting the condition of the people. He should on examining the people have authority to transfer any person from Public Works Department works, either to a Civil Agency work or to the relief camp.

I hold that there ought not to be any friction between any two such officers if they are devoted to their duty, [and each refrains from interfering with the proper work of the other as detailed above. Should any friction arise, it can be soon settled by the Commissioner of the Division and the Superintending Engineer of the Circle.

Mr. Whiting.—I decidedly think that a civil officer should be in charge of every large relief work and be always there; if the work is not large enough, it is desirable that he should come as frequently as possible. He should look to the state of the people, put them on to the work; he should not give orders, though he may make suggestions as to classing and tasking, but should receive any complaints they make, and should act generally as the friend of the people. He should talk over with the engineer any case in which he thinks the people are overtasked, &c., and if they disagree, it should be referred to a doctor. But the civil officer should not give any orders on the work, or the engineer would become a cypher.] On the Nira Canal this was the system pursued, and though there was a civil officer on the work, who could move the people about or dismiss them if he wished, about the work itself he gave no orders, but discussed all complaints with me and mentioned to me anything that he saw requiring alteration.

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Mr. Grose.—When a "smaller" work is so large that a civil officer need be attached separately to it, he should be supreme over the laborers when they are off work, and should supervise the payment. I see no need for friction. If the Department of Public Works officer and the civil officer disagree the matter can be referred at once to higher authority. A civil officer may also have to be attached to one of the larger works when it is very large. In this case it will generally be sufficient if he is a minor officer taking notice of grievances and bringing them to the notice of the superior department of Public Works officers. If the work is very large, a special magistrate may be necessary. The civil officer should never interfere with any of the Department of Public Works arrangements.

Mr. Longley.—I would not under any circumstances associate a civil officer with a Public Works Department officer in [the management of a relief work, but civil officers should have the power of seeing that coolies are not overtaxed and are regularly paid, and that sanitation and food-supply are properly attended to.

Civil officers should be empowered to see that the coolies are not overtaxed and to desire Public Works Department and medical officers to revise the classification.

He should have nothing to do with measuring or payment of wages except to see that they *are* paid, and he should have the power of enforcing obedience to his orders in non-professional matters, the responsibility in case of opinions differing resting with him; but he should not be *associated with* the Public Works Department officer. He should be in all non-professional matters the superior of the Public Works officers. His decisions should be obeyed first, and appealed against, if necessary, afterwards; and, the responsibility being on his shoulders, he is not likely to go far astray.

Mr. Webster.—A civil officer should not be *associated* with an officer of the Public Works Department in the management of a relief work under any circumstances, as it would only lead to divided authority and confusion. It should be the duty of civil officers to send coolies to works, and direct their transfer from one class of gang to another, and also to arrange for bazaars if necessary, and there his executive duties should cease. The officers of the Department Public Works should work, task, and pay the laborers and should also hut them, and construct the camps if necessary, and should carry out the direction of the civil officer as to transferring coolies from one class of gang to another. They should also have the entire management of the arrangements for transferring coolies from one work to another. Should it, however come to the civil officer's notice that coolies are not paid regularly, or are not sufficiently tasked, it should be his duty to report the matter to the collector, who would bring it to the notice of the district engineer.

Mr. Price.—I consider that where there is a large relief work, a civil officer should always be associated with a Department of Public Works officer. I am of opinion that the civil officer should have the entire control of the taking on of applicants for relief and turning them off; that the entire regulation of camps and bazaars, and the arrangements for furnishing money, finding supplies, settling disputes, &c., should be in his hands. I would leave to the Department of Public Works officer completely the tasking, payment of coolies, measurement of work, and accounting. The construction of camps I would place also in his hands, but I would not leave the plan of it either to his fancy or that of the civil officer, but give a standard pattern upon which all camps should be constructed. In short, I would leave the management, &c., of the coolies when on the work in the hands of the Public Works Department, except as regards turning them off and the management of them and their affairs, when actually off the work, to the civil officer. If this distinction be laid down, I do not see how men can very well quarrel. There will be quite enough for both to do.

Mr. H. T. Ross.—In this division relief works were conducted without any friction by an association of Public Works Department and civil management in which the duties were divided as follow: The civil officer decided what persons were eligible for admission to the work and handed them over to the Public Works officer, never interfering with them again in any way until after each day's work he was furnished with a nominal roll certified by the Public Works officer, whereupon he (the civil officer) disbursed the wages to the coolies during the following day (as described in paragraph 7) while the Public Works officer went on working those not actually being paid. The works being *nominally* under civil agency, the Public Works officer was saved the onerous duties of disbursing coin, keeping accounts, furnishing progress reports, and all sorts of returns, and the whole mass of famine correspondence. His time, which ought to be spent in the purely professional part of the management,—the tasking, measuring, discipline, execution, and supervision of work,—was not wasted in paying, accounting, and correspondence. It is, I believe, a fact that, in the present system obtaining on works in progress in this district (where the time of Public Works officers is largely taken up in the mechanical duties of disbursing coin), *daily* payments are never made; and I see from correspondence in the *Madras Mail* that several Public Works officers plead guilty to the miserable spectacle of disbursing wages up to 8 or 9 o'clock at night and thus keeping famine coolies hanging about for payment for hours after work is over.

Captain Awdry.—It would be convenient to have a civil and Public Works officer on every large work to superintend the admission of coolies and the arrangements for bazaars, camps, hospitals, and payments, &c.; during the working hours the coolies would in every way be under the Public Works officer and him only. There would be no friction if during working hours they were under one officer, and when off work under another.

Lieut.-Colonel Hasted.—It is much better not to associate a civil officer with a Department Public Works officer. European superintendence is very valuable, and two men going over the same ground is a waste of time. Let the Department Public Works men do the work, the civil officer the gratuitous relief, village relief, hospitals, &c.

Major Ross Thompson.—The setting out and measuring up of work, the distribution of laborers over the work, the rates at which the work should be executed (holding in view the current prices of the *necessaries* of life) and the payments of the laborers should rest solely with the officers of the Public Works Department. The management of the camp and bazaar, the inspection of the sheds, and of the food-supplies in the bazaars should rest solely with the civil officers.

Mysore.

MYSORE.

Colonel Sankey.—The natural divisions of duties between the Public Works and Civil Officers, when associated in charge of a relief-camp, would apparently be for the former to assume all responsibility for setting out and measuring up work and making payments, while the latter takes the whole management of the camp and bazar; but in actual practice, where only a very subordinate Civil Officer may possibly be present, the Public Works Officer may find it necessary to look after everything himself, excepting the bazar, with which, I think, in any case he should have as little connection as possible. He should also, under all circumstances, have power to inspect and give his opinion on the sanitary arrangements of the camp, the character and price of the grain supplied in the bazar, &c., leaving it to the Civil Officer to act on his suggestion as he may consider desirable. If, again, the latter thinks a labourer is being too hardly tasked, he should in like manner bring it to notice; but action on such representation should be left entirely in the hands of the Public Works Officer. In a matter of this kind I have no doubt that there will be abundant experience derived from the facts of the late famine, which will enable the Commission to arrive at sound conclusions, and my opinion must therefore be taken only for what it is worth.

Major Scott Moncrieff.—The presence of a good civil relief officer is most valuable on large relief works, but it is a delicate one requiring tact and temper. The bringing people to the works, the receiving them, the classifying them, the arrangements of the camp bazaar and hospital are all his duties, and if besides this he is a magistrate, there will be petty cases of theft, &c. to be tried by him. It is no business of his to regulate the task, measure up work, or pay wages, but if he sees that any of these details are not being properly attended to, if he finds that fraud is being practised on Government, or that undue severity is being practised towards the cooly, he ought to point the matter out to the Public Works officer in charge and mention it in his official diary to his own superiors. There are Public Works officers who look on the presence of the civil officer at all as an insult. If they show it by their conduct and persist after being cautioned I do not hesitate to punish them severely and to remove them from all relief operations.

Mr. Ricketts.—If the Public Works Department officer is a competent man, I do not see why he should be interfered with or controlled by the civil officer (who will find ample work elsewhere). In the case of a subordinate alone, then the civil officer might exercise certain control. The civil officer should, however, visit such works from time to time to judge for himself of the physical appearance of the labourers and whether they are improving and the like. The labourers, too, may have something to represent to him, and he may be able to find out frauds, &c., but all that he does should mostly be in the way of suggestion to the Public Works Department officer, or it may be in representation to higher authority. If the civil officer has time at his disposal, it should be devoted chiefly, I think, to the management of the bazaar and the sanitary arrangements of the camp and people.

Colonel Johnson.—The proper field of duty for the civil officer, if by civil officer be meant revenue officer, is the inspection of villages, the general supervision of small works and relief camps, the drafting of people to the relief works, the prevention and punishment of wandering and desertion. He should never attempt to interfere with the control or discipline of labourers on a work.

QUESTION 21.—THE REGULAR EMPLOYMENT OF ORDINARY IN CONJUNCTION WITH RELIEF LABOUR.

Besides the persons to whom employment is given with the special object of affording them relief, the Public Works Department usually employs on the works it carries out a large number of both skilled and unskilled labourers, who are dependent for their regular livelihood on the receipt of wages more or less all through the year. State how the continued employment of these may best be made compatible with relief labour if the works on which this class of men is employed are closed or turned into relief-works.

Punjab.—Skilled labourers, such as masons and carpenters, may be employed on works at their trades or as gangers; at the height of the famine they must be treated as other labourers.

North-Western Provinces.—Similar to Punjab.

Bengal.—Ditto.

Bombay.—8 answers. Skilled labour may be employed on relief works as far as there is any demand for it. Beyond that it must be employed like other labour at the same rates.

Madras.—17 gentlemen (Europeans) have replied. The unskilled labourers may either be employed as gangsmen, or fall back into the ordinary famine labourers. The skilled labourers may be employed on the works at their own trades, or as gangsmen.

NORTH-WESTERN PROVINCES.

NORTH-WESTER PROVINCE

Captain Home.—The skilled labourers would be principally masons and carpenters; their numbers are not very large, and a certain number of masonry works would always be required in connexion with the relief works, on which they could find employment. Some of them might also be employed as mistris in supervision of relief works.

Mr. Lawrence.—In the case of skilled labourers who look to the Public Works Department for regular employment there will be no great difficulty. The number of such is not large, and even in relief works employment can be found for them. With regard to unskilled labourers they will, in the beginning of a famine, when piece-work is exacted, have an advantage over ordinary labourers. When the famine is at its height, they must take their place with the rank and file of relief labourers on subsistence rates.

Mr. Quinn.—These trained labourers are invaluable as gangers, and to do that portion of the work which requires practice, such as dressing earthworks, sloping and grassing the sides, &c.

BENGAL.

BENGAL.

Captain May.—The skilled labourers employed, as a rule, are chiefly masons and carpenters. If masonry and timber bridges have to be constructed on any new road under construction as a relief work, it affords them employment, otherwise it is best to let them find employment for themselves on the relief works.

Mr. Metcalfe. — The skilled men may be aptly employed as supervisors or sirdars of gangs, as the sappers were employed in the Behar famine of 1874.

BOMBAY.

BOMBAY

Mr. Hart.—Skilled labour had best be employed under a system of task or piece work at the lowest remunerative rates, to be fixed by the Public Works officer in charge of the work.

General Wilkins.—Artisans, smiths, carpenters, and masons are, as a class, accustomed to seek employment far away from their homes, where they cannot, of course, excepting in large towns, find any continuous employment. A large number of artisans doubtless left the famine districts for those more favoured, where they could obtain work at their own trades. A great number were, however, engaged on relief works, particularly smiths and carpenters, where their services were required for the preparation and repairs of tools, and for building huts, &c. The masons had little employment in their trade, but were engaged in supervising the work-people and their work as maistries and muccadums, for which duties they were well fitted. The artisans, when employed in the manner above indicated, received higher wages than the work-people.

Artisans of other trades unused to public works joined the mass of the people on relief works. They suffered much on account of their employment on work to which they were not accustomed; but allowance was made on this account in their task work.

No relief works were started for the special employment of artisans, excepting at the poor-houses, where work was provided for those too feeble to work on relief works. Masonry works should be undertaken as relief works when combined with earthworks.

Mr. Propert.—The construction of mere lines of earthbank is in my opinion tantamount to throwing money away. I therefore earnestly recommended that in the case of all roads constructed by relief gangs, some provision be made for metal, culverts, and nullah crossings, otherwise at the termination of a famine the work done during its continuance will be found utterly useless for any practical purpose. If distress be severe, it will be found I think that even skilled labourers will be willing to accept reduced salaries rather than lose employment altogether. Skilled men must, even on famine works, receive more than mere labourers, and if their ordinary pay be reduced in the same proportion as that of the unskilled classes, it will be possible to retain their services, and thus secure something like "finish" in the project on hand.

Mr. Norman. — A certain number of skilled artisans, such as blacksmiths, stonemasons, carpenters, water carriers with bullocks, must be employed on every relief work of any size. These men must be paid according to the market value of their labour at the time. During the last famine the rates for skilled labour fell considerably. If skilled workmen apply for relief, and there is no demand for their special kind of labour, they must be taken on at the ordinary rates as labourers.

III. Qn.21.

BOMBAY.

Mr. Spry.—When the necessity for famine relief comes, the regular workers in the Public Works Department must, I think, take their chance along with all others. I do not see why any exception should be made in their favour. Many of them, however, from their previous experience of the work of the Department, would probably make efficient gangsmen, measurers, &c.

Mr. Moore.—If the works on which these skilled labourers are employed are turned into relief works, they might still be kept on working at that part which requires their skill; but if such work is not continued, or if the entire work is closed, I do not see how they can be kept on.

Colonel Anderson.—The combined employment of skilled labour in conjunction with unskilled labour is essential to the due turning to account of the latter, and indeed provides useful work for much unskilled labour. The wages need not be on the standard of ordinary times if lower would be accepted, as would probably be the case in times of general pressure on all classes.

MADRAS.

MADRAS.

Mr. Webster.—In my opinion the wages of such persons not being artisans should be reduced to the famine wage rate as soon as it is determined to convert the work into a relief-work. They would suffer, it is true, but they would still earn enough to keep them in condition. They would be comparatively few in numbers, and I consider should not be exceptionally treated.

Mr. Price.—The Public Works Department, as a rule, does not employ skilled labor direct. The practice is that work requiring this is carried out by contract. I see no reason whatever why these works should not go on during a famine just as much as during ordinary times. A contractor will not take any more men than he requires. As regards unskilled laborers, the only persons who are permanently on employ are the "mile coolies" on roads, and these men I would keep on. They are not paid daily but monthly wages. If the works upon which they are employed are converted into relief works, I would employ them as head coolies. We were glad enough to get them during the famine.

Mr. Longley.—This question appears to me to answer itself. If the laborers, skilled and unskilled, referred to depend on the Public Works Department for employment in ordinary, *a fortiori* they will be so dependent in extraordinary, years of famine. The unskilled labor will be employed mostly on earthwork. The skilled labor, such as wudders, brick-makers, stone-cutters, masons, &c., will find employment on sluices, culverts, revetments, lime-burning, &c. There is no difficulty in finding them employment if only the cost needed for masonry works in connection with the earthworks is sanctioned, and to turn them adrift on the plea of making room for distressed labor would be simply to have them returned distressed and incapable of good work, when by retention and employment their condition might be kept up throughout.

Mr. Oldham.—Writing from experience only, the unskilled laborers sank into ordinary relief laborers. We were glad to get the skilled laborers as head coolies or gangsmen. If the latter were numerous and in gangs already I would employ them on piece-work at special rates.

Mr. Weekes.—I do not see that the class of men mentioned have any claims to be treated in any way different from the rest of Her Majesty's subjects, and would give them employment on full labor works.

Lieut.-Col. Prendergast.—Skilled labor can always be employed on those parts of a work where it is ordinarily required, although the work is one of relief. Smiths and carpenters have not found employment at their trades, because buildings have not been carried on upon the system of relief wages. In the case of irrigation works, bricklayers can be employed on the sluices and calingulahs, and wudders on the stone revetment work.

Mr. J. W. Rundall.—I think that the ordinary masonry works with such wood-work as is ordinarily required should be continued, and that this work should be carried on, on piece-work, as far as possible. During the recent famine scarcely any masonry work has been done, and you find, therefore, tanks without sluices or weirs, roads without culverts and channels without head works, as mementoes of last year's famine work. I refer to the Bellary District in this statement.

Captain Awdry.—The class of labor referred to can be employed in many ways; one would be as maistries, &c., to superintend ordinary famine laborers, but the most part of them would be wanted to follow their ordinary occupations, for if famine works are to be fully useful there are many masonry works which must be constructed in connection with them, and on those works the ordinary labor would be employed.

Major Ross Thompson.—On large works, such as railways, canals, &c., undertaken as famine relief-works, there are always numbers of works requiring skilled labor. To the sites of such works all skilled laborers should be conveyed and employed there. Seasons of famine press heavily on the skilled and half-skilled laborers as well as the unskilled; buildings and other works requiring skilled labor are, therefore, by no means unfitted for relief purposes.

MYSORE

MYSORE.

Colonel Sankey.—In reference to the employment of skilled labour, it had somehow been received almost as an axiom in the Mysore famine that this class required little or no provision to be made for its members. All works involving skilled labour were, at an early date in the distress, left uncommenced. The Government of India seemed also to be impressed with somewhat the same idea.* Yet it was undeniable that—(1) as a body, the skilled workers throughout the Province were involved in the same distress as all others, and, having little or no reserve funds to fall back on, were very nearly, if not indeed quite, as liable to die for want of the necessaries of life as the unskilled; (2) the works entered in the Public Works Budget, involving skilled labour, were all in the highest degree essential, and indeed emergent.

To show in a general way how fallacious was the impression that work involving skilled labour was unfitted for relief purposes, Captain Bowen, R.E., (Superintending Engineer for Roads and Buildings,)

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* While the utmost solicitude was displayed for waifs and strays, and generally the thriftless members of society, the claims of the respectable, though equally distressed, cultivating ryot, skilled artisan, and willing able-bodied labourer did not apparently attract the needful attention.

Ch. III. Qn.

Mysore.

at my request analysed the case of an ordinary building—a *taluq* cutcherry—and the results are given in his memorandum;* from which it will be seen that, of the total labour which could be employed on such a work—a small one, no doubt—only affording employment to 117 people for 250 days—the percentages of the different classes of labourers stood nearly as follows, in round numbers:—

		Per cent.
Skilled bricklayers, carpenters, smiths		7
Half-skilled sawyers and brick-moulders		4
Unskilled	Men coolies	22
	Women	67
		100

Although these percentages may not hold good for other buildings, I think it may with sufficient safety be assumed that, in all works of this nature, not much less than 80 per cent. of the work will be suitable for unskilled labour.

As regards the remaining 20 per cent. belonging to the artificers' class, who not only suffer in famine probably quite as much as others, and who especially of all other labourers deserve the fostering care of Government from their extreme usefulness to the community, it appears to me that, unless for exceptional reasons, buildings and Budget-works generally, involving the employment of skilled labour, should for their sake be carried on as in ordinary years, provided the needful supervision can be spared. In Mysore this could certainly be done, as works of this character are as a rule carried out under contract.

Major Scott Moncrieff.—Skilled labourers if trustworthy can be employed as gangsmen, writers, police peons, &c. Unskilled labourers, if unequal to these posts, must work as ordinary coolies.

Miscellaneous.—If people begin to wander aimlessly about in large numbers, in spite of a good system of works for them to resort to, the roads should be daily patrolled by the police and these aimless wanderers made to give an account of themselves or sent to the nearest work. I emphatically protest, however, against their being sent back to their supposed village or district if there is no work there for them to go to. For they will only wander away again, and from my experience in Mysore I know they are as likely as not to give the wrong name of their village.

I think they should be prevented crowding into a town, and at once put upon works. But of course they will evade any sort of cordon that may be invented. Within the town beggars ought to be taken up daily and drafted by the police on to works. In short, I think whenever the poor have begun to leave their villages and their usual occupation to wander about or to beg, relief may be forced upon them, or in other words they may be made to find their only chance of a quiet undisturbed life is to go on relief works. For all this the police must be largely employed and much will depend on their integrity. They should be strengthened for the occasion by additional officers.

Colonel Johnson.—The continued employment of skilled labourers can usually be amply provided for on ordinary works selected for relief, and this should always be done.

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* Dated 1st September 1877.

QUESTION 22.—RELIEF WORK FOR ARTISANS, WEAVERS, &C.

Ch. III. Qn. 2

Have you had experience of any kind of relief-work other than earthwork? If so, describe it. Has any attempt been made to employ artisans, such as weavers, smiths, carpenters, &c., in pursuing their own professions, and with what success? In the case of weaving or spinning, when raw material is given out, and thread or cloth received back, is it best to pay the difference of price between the raw and the worked-up material, or to pay daily wages to the workers? State your views as to the best method of distributing the raw material, and exacting a proper tale of work, and make any general suggestions on this subject that occur to you.

Punjab.—Cotton was given out to women to spin by agency or committees. Payment made for amount spun at about double bazaar rate.

North-Western Provinces.—Thread was given out to weavers, who received daily wages or cooked food.

Bengal.—Besides masons, carpenters, and blacksmiths employed on works, work was given to spinners and weavers. Cotton was weighed out, and the cloth made therefrom taken by weight, a payment being allowed calculated to give two annas for a day's work.

Bombay.—10 answers. Opinions and experience various. In some cases raw material was given out to weavers, and the difference of price between raw and manufactured material paid.

Madras.—13 European and 1 Native gentlemen have replied.

When weaving and spinning are resorted to for relief distribution of the raw material is considered preferable to money advances, but a small advance in corn for subsistence until the material is worked up, and the people receive the price of the cloth, is necessary. This is gradually adjusted as the work is brought in. Payment of daily wages in such cases is not expedient.

PUNJAB.

Mr. Coldstream.—During the recent scarcity a system of relief work for women in cotton spinning was organized, and carried out through the members of the municipal committee.

A certain sum was allotted to each member, and he purchased clean cotton and gave it out to spin to the poor women of his district or ward.

Wages were paid for the amount spun at about double the bazaar rate, as the relief was intended for the more respectable class of women, who could not from shame appear at the relief work. The plan was successful, and a considerable amount of relief was in this way afforded.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Lawrence.—I have had no experience of any kind of relief work other than earthworks, save on a small scale in poor-houses.

The case of city artisans, such as workers in gold and silver thread and wire (*bataiyás* and *dakaiyas*), weavers of silk and cloth, finer kinds of the (*kasbis and juláhás*), workers in embroidery (*sozan kars*), deserves more attention than it has hitherto received. These people are generally Muhammadans. They will not do earthwork, for which they are physically unfit, nor will they on any account allow their wives and children to come on the works. These people are to be numbered by thousands in Agra. These men have generally a wholesale dealer or firm through whom they trade. It might be practicable to make advances to them through this firm, to be repaid without interest at the end of the famine.

Mr. Whalley.—Yes; I have tried the experiment of employing weavers at their homes in their own art.

I have made advances for cotton thread through the Zemindars who selected the weavers to be employed, served out the threads and received the manufactured article.

I found that the difference in price between the raw and worked-up material at present rates was insufficient for the support of the artisans, and they were paid daily wages through the Zemindars.

The accounts are not yet cleared and the manufactures have not been sold, but by an estimate of the value of the latter at market rates the artisans appear to have earned three-fourths of their subsistence.

This is a better result than average earthwork.

Mr. Story.—In the Jhánsi poor-house in 1868–69 the weaver classes were employed in making cloth for the inmates of the building. Thread was issued out and a certain time allowed to weave the cloth required. The people took to it readily, much preferring to do work they were accustomed to to going to work on the roads and tanks. They received only cooked food exactly the same as the rest of the paupers. As an inducement to work well a little extra food, or a pice, was given to those who had worked hard and had exceeded their task within the specified time.

BENGAL.

BENGAL.

Mr. Magrath.—I have mentioned the employment of spinners and weavers, and also that of blacksmiths; carpenters, and thatchers were employed in building golas, temporary offices, and timber bridges. Masons, of which we had but few, repaired broken masonry bridges and built a dák bungalow, which was required. All the men were working at very slightly enhanced rates, and the work they did was all efficiently supervised and good.

I should not dream of paying daily wages to spinners and weavers. We weighed out cotton to the spinners and gave them so much for work by weight when it was brought back spun, making a slight allowance for wastage, and deducting for bad work.

The rates paid for work were calculated so that a person doing a good day's work received about two annas a day. In the case of beginners we gave a little more at first. The thread was handed over to the weavers by weight, and the cloth woven paid for again by weight, about 10 per cent. being deducted from the weight of the cloth owing to its being always damp from wetting the threads in weaving. Deduction was also made for bad work. The cloth of course has to be stored, as it does not command a ready sale in famine times, but is easily disposed of afterwards, and the poor-houses take a certain amount for the very ragged poor. I have already expressed my opinion that the raw material should be distributed by weight and work paid for by weight also. In places where much jute or hemp is grown, the people can be well employed in making bags, of which a vast quantity are always required. Again, amongst hills, quarrymen, stone-cutters, and stone-breakers can be employed in quarrying, dressing, and breaking stone, to be afterwards sold. Professional brick-makers can be making bricks for present and future consumption. In fact, if Government is not afraid of outlay recoverable by degrees, and possibly not entirely in full, it is possible to utilize very many artisans at their own trades.

Mr. Henry.—During the famine of 1874 in Tirhoot, whenever practicable, employment in their own professions was offered to artisans. In the villages forming part of my relief circle, but principally in the town of Durbhunga itself, considerable employment was given to three classes of artisans—dhooniyas (wool-bowers), spinners, weavers.

Government had sent up a large consignment of cotton. On inspection it was found to be of inferior quality and exceedingly dirty. The first thing we did was, by an experiment made in the presence of a responsible officer, to ascertain what amount of loss of weight resulted from the process of "bowing" and effectually cleaning a certain quantity of the cotton. We then weighed out the uncleaned cotton to the dhooniyas, explaining to them the amount of wastage we were prepared to allow. They brought back the cotton thoroughly cleaned, and after adjustment of weights, were paid in grain for their labour at certain fixed rates. I have been unable to see old returns and cannot give figures from memory. The cleaned cotton was then weighed into store. Employment was offered to women in need of it. For many of them we had to provide spinning wheels; this necessitated the employment of carpenters for a time.

Women wishing to work as spinners presented themselves at the cotton golahs and there received a supply of cotton to be spun into thread. The wastage allowed and the amount of grain wage to be given were fixed after experiment and inquiry. Good workmanship carried special rates.

The thread received was then entered in store and given out to weavers to be woven into cloth. Sufficient precautions were taken to protect ourselves against fraud. All the cloth so made was given out on indent for gratuitous distribution. In some few cases the quantity of thread or cloth returned by the spinners or weavers was below the limit we had fixed. In all such instances deficiency in weight had to be made good from wages.

Baboo Hari Mohun Chandra.—Besides earthwork, I used to employ Hindoo ladies in spinning thread, and Polia and Mahomedan women in making gunny-bags,—the latter to a very large extent. The women thus employed were all on charitable relief. The Mahomedan and Polia women were paid half a seer of rice and one pice each day, on condition of making one gunny-bag in a day. I used to give every morning one seer of raw jute to each woman, who, on the following morning, used to give me one sackcloth weighing one seer, when the daily rations, consisting of half a seer of rice and one pice each, were given.

BOMBAY.

General Wilkins.—The masonry works on a new line of ghat road twelve miles from Belgaum were executed simultaneously with the earthworks with the greatest advantage.

Mr. Propert.—As regards Khandesh the relief works were carried out as I have described in the last paragraph, and consequently are now of real practical use. The employment of artisans in pursuing their own professions was only tried to a very slight extent in my district, but in the town of Yeola, situated in the neighbouring district of Nassick, the weavers were, I believe, to a great extent employed at their own houses. The result will probably have been recorded by the Collector of Nasick.

Mr. Norman.—I have had no experience of any kind of relief works except earthwork. No attempt was made in this district to employ artisans at their own trades on relief principles. I am therefore unable to offer any opinion on the subject referred to in this question.

Mr. Spry.—At the beginning of the famine, smiths were employed in making tools, carpenters in making handles, and basket-makers baskets, and relief was thus successfully given to those classes.

To indigent weavers and spinners also raw material was given out, and on the cloth or thread being brought back, the difference of price between the raw and worked-up material was paid. This plan was better than paying daily wages; for by paying the difference of price a man and his family had an incentive to work, whereas with daily wages there would be an incentive to idleness without any possible check and the daily wages besides would lead to complications and frauds. The raw materials thus given out were only distributed to people of ascertained poverty.

Mr. Charles.—The only such experience I have had is in an attempt made to provide work for the Hubli weavers. Government gave an advance of Rs. 500 or so for materials, and a few of the poorest families of weavers were engaged to make the kind of coarse cloth used for tying up daftars. But I cannot say the experiment answered well. There were hundreds and perhaps thousands of other weavers just as deserving of assistance, and yet it was impossible to assist them, both because advances to the extent of perhaps a lac of rupees would have been necessary, and because no sale could have been found for the immense supply of cloth they would have made. The system pursued was to guarantee the price of the materials to the Saukar, who usually supplied the weavers with thread, and to pay the weaver a fixed price for the finished cloth, out of which he repaid the Saukar.

The price fixed was the price of ordinary years per yard, fixed after a calculation as to the sum that would remain to the weaver after repaying the advance, and the number of days it would take him to make a piece of the usual length.

Mr. Hamilton.—We attempted to employ weavers by giving them advances to purchase raw cotton, which they were to repay in instalments without interest. They did not purchase cotton, but spent the money, which had to be recovered from their securities.

Colonel Anderson.—On this point I only know that women were successfully employed in some of the relief works in Kaladgi in spinning. I have no particulars of the management noted down.

Mr. Robertson.—I have not been in charge of works.

I think cases may arise when it is necessary to help local trades, especially those of weavers. Other artisans will generally find sufficient employment (unless a famine is protracted over two or three years) to keep the wolf from the door. In the late famine such aid was given at Vita in Satara, at Yeola in Nasik, and at Sangamner in Ahmednagar.

Advances were made to the different weavers on security, the weavers entering into a bond to make over the worked-up material or repay the advance to Government.

As a rule the advances were repaid with fairness.

I think the better plan would be to give the raw material, taking it back when made up, and pay a fair market price for the value of the labour.

The system has been carried out to so small an extent that it is difficult to pass any opinion as to the best method of distributing the raw materials. I am afraid that any system introduced would prove unsatisfactory and lead to loss and peculation, and I prefer as far as possible to trust to out-door labour.

Mr. Bosanquet.—I have already stated how weavers were employed here. When work was finished they were allowed the difference between the cost of the raw material and the estimated value of the material when made up. This I consider to be the equitable and proper mode of payment. As in earthwork, so in this, value of work done should in my opinion be the only basis of payment.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.—In these provinces smiths and carpenters are too few and too well-off to want relief; probably this is the case elsewhere. If they worked in connection with our relief works it would be on contract or on daily rates, quite separate from the relief gangs.

The poorer classes of weavers in the villages are all accustomed to field work for short periods in ordinary years; and therefore earth work suits them well enough.

At Murwarra I saw the infirm paupers in the poorhouse employed, mostly for the sake of occupation, in spinning.

In Dinagepore, under my directions, much charitable relief was given to the women of poor but decent families in preparing cotton, in spinning cotton thread and jute yarn, and in weaving and making up cotton cloth, and especially gunny bags. If we had paid daily wages we should have been unable to get the work done without incessant worry. It appeared decidedly best at a slow remuneration as was possible, to arrange for the raw material being served out, and the manufactured thread, yarn, or cloth being brought back. I believe the people behaved quite honestly with the raw material, which was only served out to those for whom some respectable person gave some sort of a recommendation. The recipients could work as much or as little as they liked. The rates at which they were paid was considerably under the ordinary rates of such labour.

MADRAS.

Mr. Longley.—Besides earthwork I have had experience of weaving and spinning.

No attempt has been made in Salem to employ artisans, such as smiths and carpenters. Weavers are very numerous (especially in the town and taluk of Salem). This class of people commenced to feel the distress very severely owing to the extraordinary dullness of the cloth market, so that State relief was administered to them by advancing materials for weaving cloths on payment of fixed wages, and more than 3,000 families of this class were thus relieved in the Salem taluk alone under the superintendence of a special officer. This relief, no doubt, kept large numbers of weavers and their families from leaving the district and seeking relief in other centres of weaving such as Tanjore. Seven lakhs was laid out on this form of relief, of which about two lakhs has already been recovered, but the cloths are likely to be on hand for some time yet; and, though the outlay has been large and the recovery by sale likely to be slow, the employment of these weavers on their own industry kept large numbers from wandering and from falling on to gratuitous relief and thereby becoming demoralised.

In the case of weaving and spinning neither the payment of the difference between the raw and the worked-up material, nor the payment of daily wages to the workers commends itself. A fixed price settled with reference to the description of the product is preferable for reasons stated *infra.*

My views are—

(1) A depôt must be established at the chief centre of industry with as many branch depôts as may be needed to facilitate the grant of relief by advances.

(2) A small establishment should be attached to each centre or branch depôt to keep accounts of advances of materials and delivery of products, with a sufficient inspecting staff to see that the advances are not misappropriated and to enforce delivery of products.

(3) Raw material only must be distributed, the system of money-payment being open to objection, inasmuch as it allows scope for misappropriating a portion of the advance and buying with the remainder an inferior quality of material. If *materials* are given out, there is less scope for such practices, with a greater certainty of the materials being utilised for the purpose for which they are advanced. The raw material should be purchased in quantities, and a sufficient stock kept in hand to meet the advances.

(4) With the raw material a sufficient sum to meet the incidental expenses in the preparation of the material and a small advance to support the workmen till the materials are worked up must be given.

(5) When the products are delivered, the wages, settled with reference to quality thereof, must be paid, deducting the advance already made, together with any fine that may have been imposed for bad workmanship, &c. I do not advocate the payment of either daily wages or the difference between the ordinary market-value of products of similar description and the value of the materials advanced *plus* the incidental charges; as in the former case a proper return in work for wages paid is not ensured, in addition to the contingency of Government having to pay more than the ordinary price of the product. In the latter case the ordinary market value of products changes so constantly according to the demand that it is difficult to fix such prices with certainty.

(6) The advances of materials must be renewed as often as the previous advance is worked up and a return made.

(7) The products received must be kept in store, all cloths received in branch depôts being transferred to the central depôt and disposed of as the market improves; if the products are kept too long, there is danger of deterioration and consequent heavy loss to Government.

Mr. Price.—The only case of employing artisans of which I have seen anything has been providing advances to weavers; these were made by giving material for a certain quantity of cloth and an advance calculated to support them during the time that, under ordinary circumstances, they would spend in weaving up the material. They then delivered the cloths to the appointed officer, received the usual value of the cloths *minus* a portion of their fresh advances, and a second supply of material, and so on, until finally all that they received in advance was the material, they subsisting on the sum represented by the difference between the value of the material and the ordinary market-price of the cloth brought in. This was the system in Cuddapah. Government, I believe, had planned that the money advance given in the first instance should be deducted from the price of the first set of cloths, but we found that this would not, in practice, work well, so we took the money back by instalments. I infinitely prefer the system which makes the artisan's living dependent upon his own industry, and which does not leave it optional with him to work or loiter as he sees fit, to paying him a daily rate. Besides this, payment of daily wages not only increases the opportunities for levying black-mail, but where a large number of persons is concerned, increases work and accounting.

The mode in which we worked in Cuddapah,—and it was one which was arranged after considerable consultation,—was that the weavers came into the head-quarters of the taluk or deputy tahsildar's division, and there, after the head man of the village or the head weaver certified to the respectability of the man, he received yarn, which we had previously purchased, calculated to make a certain number of cloths, generally from two to six. This could be very easily judged. With the yarn he had an advance for subsistence given him, calculated on the number of days within which, if he worked at the usual rate, he would have the cloths ready. He then went to his house and, at the end of the time fixed, if he did not appear with his cloths he was looked up, and he got no more money until he had finished the cloths. The work of distribution was carried out by a gumastah and an account actually with each weaver was kept. The system worked excellently, and out of considerable advances made we lost but a very small sum, and, to the best of my recollection, in the end sold our cloths at a profit.

Mr. Stokes.—Weavers were largely employed in this district. We have over Rupees 20,000 worth of cloths on hand which we find it very difficult to get rid of. The aid to the weavers was great and successful. The other artisans are not in such numbers and none needed aid.

Mr. Gillon.—In the case of weavers, it is specially desirable that they should be allowed to pursue their own profession. They are most useless on a relief-work; they have no aptitude and not sufficient strength, as a rule, for hard labor; while by working with the pick-axe and the spade, they lose that fineness of touch which is so essential to them as weavers. Moreover, the Government obtains no adequate return for its expenditure by employing them on relief-works, while they can be employed at a profit as weavers.

Ch. III. Qn. 22.

MYSORE.

Mysore.

Mr. Ricketts.—In the case of weaving and spinning, it is best to pay the difference of price between the raw and the worked-up material, together with a slight advance on the market rates, and not to pay daily wages to the workers. In weaving and spinning it is easy to give out the raw material and know what the exact tale of work should be.

It is questionable whether such attempts are advisable, inasmuch as it tends to overstock in famine time what may be termed a glutted market. The existing supply is then sufficient for an extremely limited demand, and as the demand improves, so will the supply keep pace in the ordinary operation of trade. To then gut the market with articles made up at a price beyond what private dealers can afford to pay, and perhaps to sell them at a lower rate than prevails in the market at the time, simply benefits a few persons for the time being, and then works them, and all of their profession harm afterwards by the stagnation of trade till the Government surplus is cleared off. At the same time it is to be observed that it is very difficult or impossible to relieve some persons except by such means, and the only remedy appears to be in creating an artificial demand for clothing by Government largely distributing it to cover the poor and for hospital use. In this respect the Mansion House Funds were a great boon, but those who got clothes often parted with them for a trifle, and probably to the more thrifty, who thus have a store which will prove detrimental to trade in cloths for a certain time to come. However, this Mansion House Fund distribution has so mended matters in promoting circulation of money that it is probable the anticipated harmful results will not arise, or only to a limited extent.

Relief works alone should not be the universal panacea for relieving distress. Other regular works, such as stone revetment to tanks, buildings, &c., necessarily give employment to wudders, carpenters, bricklayers, and maistries, &c., who otherwise would be in great distress. It is certain that the lives of many wudders and their families would have been saved if they had found suitable employment during the famine. It has been calculated that even in such a small work as the erection of a taluk cutcherry the total number of ordinary coolies that would be employed in the various works relating to such construction, independent of artizans, &c., would be no less than some 20,000. The more, therefore, regular works are pushed on in famine time, the larger the number of persons saved from starvation, as after all special relief works and camps do not anything like meet all actual requirements as regards giving livelihood to all who require it in all the different phases and ramifications of the labour market.

Colonel Johnson.—I have no experience of employing such people as weavers at their own handicraft, but smiths, bricklayers, carpenters, stonecutters, and wudders, and all such handicraftmen, can easily be provided with work, often on the relief works themselves.

SECTION 2.—GRATUITOUS RELIEF.

QUESTION 23.—THE POOR-HOUSE.

Ch. III. Qn. 23.

The commonest mode of administering gratuitous relief is through the poor-house. What is he proper situation for a poor-house so as to secure accessibility, discipline, space, water, and proximity to food-supply? Is an enclosure wall or fence necessary, and of what should it be made? What total area is desirable in proportion to the whole number of inmates? What shape and material are best for the huts, and what sleeping space (in superficial area) should be provided for each inmate? How may they best be arranged with a view to ventilation, &c.? How should the latrines be placed and managed? What is the maximum number you would accommodate in one poor-house? How should the inmates be separated and classed together, so as to provide for the requirements of caste, for the keeping of families together, and for the separation of the sexes in the case of persons who do not belong to families?

Replies not summarised.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—The first part of this question can be properly answered by the Medical Officers, but as far as possible Hindu and Muhammadans should be accommodated separately. The inmates of one family should be kept together, and those who do not belong to any family should be separately accommodated with regard to religion, sex, &c., *i.e.*, male Muhammadans and Hindus, and so the females of both classes, and the inmates of inferior classes, such as sweepers, domnás, &c.

NORTH-WESTERN PROVINCES.

North Western Provinces.

Dr. Loch.—A poor-house should be situated outside (say one or two miles) the head-quarters or subdivisional station. For the hot weather a not too closely planted, well-raised, and healthily surrounded grove should be selected; for the rains or cold weather an equally well-placed open spot is preferable. A grass enclosure wall should surround the whole area included; the area will vary so much in size, according to the nature of the ground, that I don't think any rules can be laid down for its size.

Huts with double sloping roofs placed on three sides of a square, the backs and ends closed with grass up to within a foot of the roof, that space being left open; ventilators should be placed as near as possible to the ridge pole at short intervals; 9 feet × 4 feet superficial space should be allowed for each adult; but unless ample covering is supplied, the inmates will crowd together for warmth in the cold weather.

They should be placed in three sides of a square, with a considerable space between each such set of huts, the open side to windward, except in the cold weather, when this position would render them very cold.

The latrines should be placed to leeward of the sheds; if ground is available, the trench system should be carried out, one or more trenches being used from early morning till noon and then closed, and others from noon till night; they should be separate for men and women. If ground is not available for the trench system these four spaces should be enclosed, and, if used in the rains, roofed in. The earth within these enclosures should be well loosened to a depth of three feet and removed, so as to make the surface a foot below the surrounding ground; one of these enclosures to be used the first half of the day, the other the latter half, each being thoroughly cleaned immediately it is closed; and once a week the other two will be used, while those that have been in use should have all the loose earth removed, the space thus dug out left open for at least a couple of days and then filled up with fresh dry earth. Hindus, low castes, and Muhammadans should be in separate enclosures. It is not possible to give separate spaces to each family without stopping ventilation and accumulating filth; grown-up men, unmarried or without their wives, whether with or without a family, should be in a separate enclosure.

Unmarried women or women without husbands should be placed in a separate enclosure, close to that occupied by the families.

There should be two hospitals (irrespective of one for inspection of diseases)—one for males and one for females; they should be arranged in three sides of a square; one side for diarrhœa and dysentery cases, one for other cases, and the third for convalescents. Each patient should have 9 feet × 6 feet superficial space. In the cold weather blankets or razais (the former far the better, as they can be washed) should be distributed, and native cots for those that need them. The food should be cooked by Brahmans, from whose hands all classes and castes will eat—Muhammadans as well as Hindus. The attendants should be Kahars. The Civil Surgeon should visit the hospital, as indeed all parts of the poor-house, as often as is deemed necessary, but all orders other than those regarding the treatment of patients to the Hospital Assistant or Native Doctor should be issued through the officer in charge of the poor-house, under whose immediate orders he should be placed.

Dr. Bonavia.—In the Fyzabad city the temporary poor-house instituted to meet the distress of the district is in a grove about 1½ mile from the city. It consists of huts 60 feet long and 16 feet wide and 5 feet high at the eaves. Each hut is made of bamboos and grass, and accommodates 25 or 30 persons. The site was drained by channels throughout the ground leading into deeper ones. This distance from the town secures accessibility and everything that is requisite. Some sort of enclosure is desirable, although that of the poor-house here is nominal. A few policemen keep order. The distance between the huts is 30 feet, and this has been found sufficient. Ventilation is secured by having several openings all round each hut; when cold at night, extra tattis are put up on the wind side. The latrines should be at a convenient distance, as weak persons cannot walk far, and the situation should be such that the wind will not blow from the latrines to the huts during the prevailing winds. There should be a sufficient number of sweepers not only to attend to the latrines, but also to keep the ground clean, as at night weak persons think nothing of squatting anywhere. The sweepers should be hutted in the grove. The best form of latrine are trenches screened by grass tattis—one for males and one for females. Each trench is filled daily by the earth dug out of the adjacent new trench, and so on, till the piece of ground screened off is used up; then the tattis are moved on to a fresh piece of ground, and the *old* one is levelled and properly dressed.

The maximum number at one time in the Fyzabad poor-house was 946 on 24th August; 1,000 are not too many to accommodate in one place, in a grove, provided overcrowding is guarded against and cleanliness duly cared for. In the Fyzabad jail, within the jail enclosure there have been this year 1,150 prisoners, but then the ventilation and cleanliness are scrupulously attended to. Nothing is easier than to separate the inmates by having separate huts for the low and high castes.

When people are really starving they do not make much fuss about caste—at least no difficulty whatever has been found about this in the Fyzabad poor-house. If necessary, separate cooks may be set apart for Hindus and Muhammadans, but this would entail an extra trouble. In the Fyzabad jail Brahmans cook for both Hindus and Muhammadans, and all castes are put in the same barrack; no difficulty is ever made about these matters. Separate huts, and enough of them, should be set apart for—

(1.) Small-pox.

(2.) Cholera.

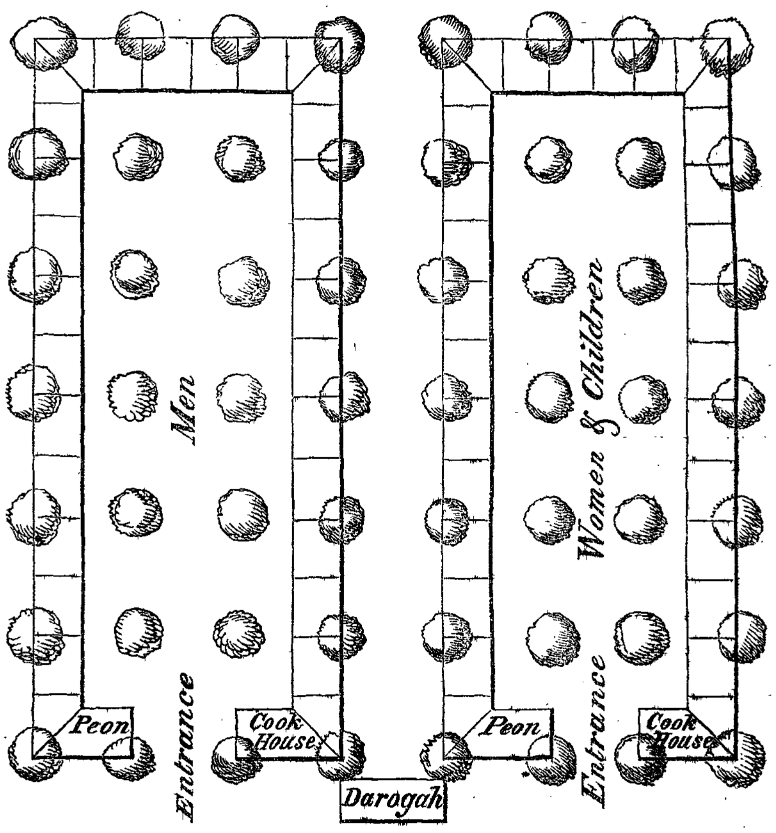
(3.) Diarrhœa and dysentery.

(4.) Other diseases.

It would be advisable that separate huts for the four classes should be placed in "echelon," so that the prevailing winds may not blow off one to the other. A native doctor or a good compounder, with a sufficient number of sweepers, should be hutted near the hospital, which should be at some distance from the main body of the poor-house huts.

Dr. Planck.—The proper situation for a poor-house in times of famine prevalence is a site not previously inhabited, the ground of which is shaded and naturally well drained. A grove of full-grown trees standing on land answering to that description and situated about a mile outside a sudder or important town is the best possible position for the establishment of such poor-house.

To illustrate my view of the best possible arrangements for accommodation, classification, and orderly management generally in such institution, I make the following rough sketch of a grove arranged as I think it ought to be for this purpose:—



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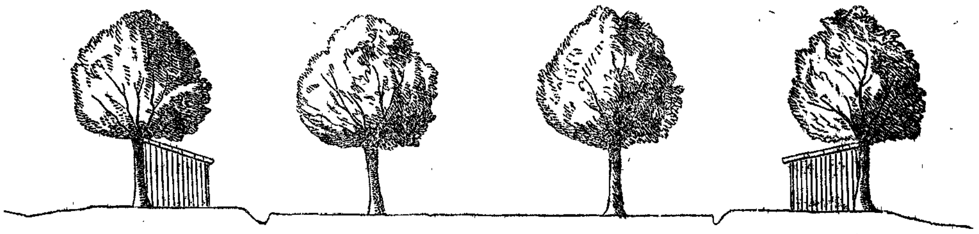
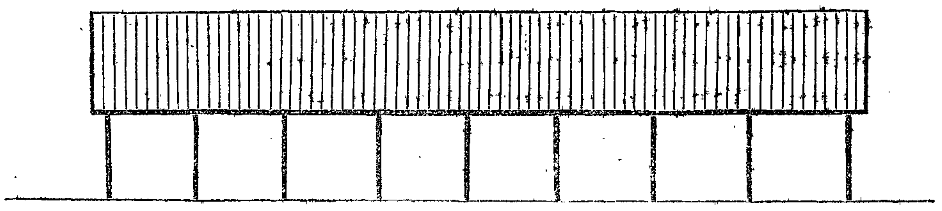
It will be seen that the arrangement consists of two enclosures—one for men, the other for women and children; the enclosures to be formed and bounded by huts after the manner of a sarai; the huts to run in line with the trees, by which the support of the huts will be greatly helped.

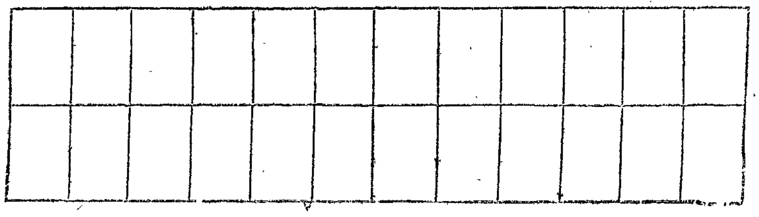
I think the best kinds of huts for this purpose are thin well-made thatches, open in front, and closed behind by a thin *tatti* or trellis filled in closely with long coarse grass; the thatch set up on *ballies* or poles thus, from end to end of the line of trees :—



showing a frontage thus :—



The long hut thus provided being divided by thin partition walls of grass into compartments, each to accommodate 24 persons. The floor of each compartment to be at least 10 feet wide and 36 feet long, so as to allow a floor space 3 feet wide and 5 feet long to each inmate. It would be better to have the floor 12 feet wide, so as to ensure a clear passage at all times down the centre of the hut, but then the thatch would have to be abnormally wide. And, I think from what I have seen of the inmates of such poor-houses that a space five feet in length will suffice for they very seldom sleep extended. The thatches will of necessity have to be set up by skilled labourers, but the very first work of the paupers admitted should be to raise the floor of the huts with earth to a height of three or four inches above the general surface, to smooth the floor carefully and mark it out with deep lines into 24 equal spaces thus, each space to be the sleeping place of an inmate :—

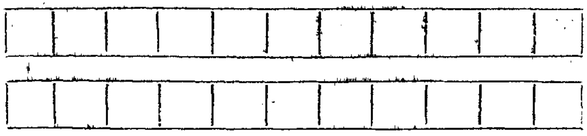


I. III. Qn. 25.

North-Western Provinces.

They should then proceed to smoothen and gradually slope the surface facing the huts for a width of 16 feet; the termination of the slope to end in a wide shallow drainage way or depression, cut in saucer-shape three feet wide and not more than six inches deep in the centre. The earth removed will help to make the floors.

The slightly sloping platform fronting the huts is to be especially utilized for the distribution of diets, its surface being marked out in the centre after the manner of the sleeping floor, but with a central passage for the cook and distributor, thus, the spaces being 2½ feet square, the central passage a yard wide :—



The diet spaces being narrower than the berth places, an unappropriated space of six feet between each set will remain vacant, to be utilized as a pathway. The platform being 16 feet wide, and the spaces with their passage only eight feet wide, a pathway of four feet width may be provided on each side of them.

The inmates should not be permitted to walk over the diet spaces; and to aid in preventing this, the backs and ends of each set should be fashioned as a mud wall about a foot high. The surface of the diet spaces should be frequently washed over with clay water in the morning time, the lines fashioned with the fingers whilst the surface is moist.

So much of preparation having been effected, the inmates will proceed to provide a shallow drainage channel at the back of the huts, slightly raising and sloping intervening space of 4 feet. When this has been done, and adequate provision made against the possibility of the flooding of the grove after rainfall, by ensuring that the drainage lines end in land sloping away from the grove, I think a wholesome place of residence for the inmates will have been provided; and then the business of saving their lives and bringing those who are emaciated back to a condition of fair health and strength may proceed with good hopes of success.

The first step to be taken in this direction is to ensure the supply of the best drinking water available for the use of the inmates. This is a point of great importance, for if the emaciated people drink bad water they are not likely to recover their strength quickly, however well fed. Local inquiry will always result in the discovery of a well from which the people of the neighbourhood habitually drink. It will be generally safe to use the water of that well. Immediately facing every compartment, and near to a post, an earthen water vessel with a narrow neck should be sunk into the ground up to the neck. The vessel should be large enough to contain 24 quarts of water, and its mouth should be covered with a saucer.

Bhistis attached to the poor-house will fill the vessels every morning with water from the well selected as the source of water-supply, and the inmates will be required to drink that water only, dipping it with a tin vessel to be kept for that purpose, and to be hung by its handle on the adjoining post when not in use.

Another step of great importance in regard to the attainment of the object aimed at is the maintenance of a good conservancy. A condition of perfect surface cleanliness should rule everywhere in the grove and its precincts. The inmates of every compartment should be required to keep it and its adjoining surface clean, to repair its walls, to brush the white-ants from the posts if they appear, and in every reasonable way to protect their temporary home from injury and to preserve its wholesomeness.

About 50 yards outside the grove, two spaces, each 10 yards square, should be fenced off with grass screens and utilized as latrines—one for males, the other for females and children.

A sweeper provided with a spade must be placed in charge of these enclosures, and it should be his duty to dig a trench a foot deep and a foot wide every evening from end to end of each enclosure, throwing the earth to one side of the trench only. The inmates of the poor-house should be required to frequent these trenches only as a retiring place, the resulting impurities being covered with earth by the sweeper, as often during the day as may be necessary to prevent any continued unpleasantness there; the trench to be filled up and levelled in the evening after the new trench has been dug. When the surface of the enclosures has been trenched all across, new enclosures must be formed by moving the screens.

Urinals I do not think would be likely to be frequented if provided, but it should be ruled that no adult person, boy or girl, can be permitted to make water anywhere within the shelter of the grove.

With regard to children, and especially infants, I think some special arrangement is necessary. I have noticed in poor-houses that the mothers, or women in charge, are, as a rule, very solicitous about preventing anything of permanent unpleasantness arising from the presence of the children, scraping earth over moist places and removing with the aid of sticks or leaves or rags the more solid impurities to throw them behind the habited site. I think a good-sized basket should be placed at intervals in the centre of the women's enclosure, and the mothers be encouraged to mix such impurities with earth and throw them into the basket for daily removal to the latrine trench by the sweeper.

From what I know of the people who come or are sent to a poor-house, I do not think any difficulty is likely to arise by reason of caste or religious prejudices. Their previous distress has been too real to leave any considerable anxiety on that score upon their minds. In most cases they have eaten, from any person's hand, food prepared in any way, and not even refuse skins of fruits, or scraps that have been in other persons' mouths. I have seen a line of perhaps a hundred such persons eager to take food from my hand, ready to scramble for bread off my plate; have known such persons to pounce upon and devour skins of mangoes or oranges thrown out of a tent or house.

In time of hunger I think caste feelings are in abeyance for the hungry; and, indeed, the vast majority of those who are brought so low by distress as to require admittance to a poor-house are persons to whom caste observances are of little importance at the best of times.

Yet, believing this, I think it would be well, as a thing likely to be remembered with gratitude, that, in the management of a poor-house, something of attention should be given to this matter, extending at least to the ordering of the inmates, so that Muhammadans may inhabit the same compartments and eat and drink together. Hindus of caste position above and including Kahars should be in like manner encouraged to keep together. For the rest, caste may be allowed to manage itself without fear of trouble, provided always that mehters are lodged and fed apart, and that food is cooked and served out by Brahmans.

The maximum number of inmates in a poor-house should be 1,000 persons—men, women, boys, and girls. Infants or very small children, who sleep with the mother, not to be counted, excepting in the case of a mother with more than two children; the mother then to be counted as two persons and allowed two adjoining berth places. For the accommodation of 1,000 persons a running length of 500 yards of shed, 10 feet wide, will be required.

I do not think a poor-house can be properly managed on the principle of keeping families together.

The women, girls, and children must be separated from the men and boys; and I believe the husbands would rather have it so ordered, provided that their wives and children are near enough for occasional observation.

Mr. Metcalfe. — The administration of relief on a very large scale, through poorhouses, is unsuited to any but the poorest and lowest class of the community. No high caste person will, in my experience, partake of cooked food within the enclosure of a poor-house, even though that food be cooked by a Brahmin. I have the very strongest prejudice against poor-houses,* except for the class I have referred to in paragraph 11. The argument for their establishment is that it is a good test of proverty and that only persons really starving will accept food in a poor-house; but the persons who advance these arguments entirely overlook the fact that in famine times it is the class of respectable agriculturists who suffer as well as the professional beggar and the daily labourer, and it has always seemed to me a monstrous doctrine that the administration of relief should be accompanied by terms which are so humiliating to the starving family of the higher castes that its members prefer death to accepting the Government dole of charity.

The argument that liberal charity demoralizes the population is not borne out by the experiences of the Behar famine. It will be found that it is not the officers whose duties bring them face to face with the work of feeding a starving population who express fears of demoralizing persons, and who suggest all kinds of preventive measures against the bugbear of demoralization, but writers who draw their conclusions from theories. I respectfully offer my opinion that relief through a poor-house, *i.e.*, in an enclosure, in which at stated times cooked food is served out, although suited for beggars, lepers, worn-out prostitutes, and the very lowest castes, is wholly unsuited to meet the requirements of an extensive famine. Dharmsallas and the daily grant of doles are institutions well known in every part of India, but they are resorted to* by the most abject of the population; in other words, by those persons who, having no means of subsistence whatever, step by step have become more and more reduced during the period of their worldly declension and have become gradually habituated to the idea of receiving ***bhik***.

To offer an agricultural labourer, reduced through the pressure of a famine, the prolongation of his life on the same terms on which the dregs of the population ordinarily live is to offer him terms which are most humiliating to him, and which he will probably reject. It may be that in some parts of India prejudices are less strong against this form of relief. My views are based on the popular feelings on this side of India.

As regards locating many thousands of distressed persons in pauper villages, conceive the expenditure necessary for the erection of huts over a whole province afflicted by famine, the waste of force in classifying a population into castes, in separating sexes, in billeting persons, in inquiring into applications for admission. All such arrangements signify large supervising establishments, *i.e.*, money. I ask which is best, that money should be spent in establishments or in food; in building houses, when persons have houses; in imposing conditions, when whole families are appealing for food. The questions stated in No. 25 are tantamount to enforcing the humiliation of poor-house relief on a starving population through legislative enactments. The whole of the suggestions contained in the questions from paragraphs 23 to 29 are in my opinion—(*a*) unsuitable to the circumstances of the country; (*b*) unnecessary on the grounds of being most economical to the State; (*c*) far more expensive than village relief; (*d*) equally demoralizing to the population if they become demoralized at all.

If it be asked if poor-houses are objectionable, how then (question 31) are the sick, the infirm, the cripples and bedridden folk, the orphans and deserted children, the wanderers without house or village, to be cared for? the answer is this—the sick, the infirm, the cripples, must be cared for in their own villages. The orphans and castaways should be sent to central nurseries, which should be placed under the charge of ladies, if any be available, with a native medical officer in attendance; and as for the castaways, temporary sheds near the civil officer's quarters are sufficient, the wanderers being employed in making baskets or in some other work. If it be asked—Describe the system then under which village relief can reach the classes referred to? the answer is—assume a tract of a famine-stricken country, famine-stricken in the sense that there exists no available food for the mass of the people. Divide that tract into circles, each containing from 50 to 200 villages under a Government officer. Subdivide the circle into village groups. Appoint a relief officer, a native, with a writer to each village group. Prepare lists of all able-bodied labourers, and separate lists for the sick and infirm. Village group officers report daily to the central officer the condition of the villagers. On receipt of orders they draft the able-bodied to works which have been designated in the orders, and place the sick and infirm on rations; granaries are formed at convenient places in charge of special officers who comply with indents from village group officers, and these granaries again are supplied from central granaries.

The village group officer's report informs the central officer of the state of each village, and, if necessary, of the state of each person every 24 hours. The circle officer has it then in his power to pass distinct orders regarding the population of each village in accordance with its special requirements. His medical staff are constantly on the move from village to village. He himself is daily in the saddle, going from village to village, or work to work. The result sought to be attained is to keep everything as much in its ordinary groove as possible. The able-bodied labourers are kept together in village gangs. Soon they save up a little grain and send their families back to their homes, themselves remaining on the works and supplying their families, thereby rendering organization the easier by reducing the numbers on the works. Relief can be stopped, modified, or extended systematically.

Now which is the better system—an orderly village organization, the population well under control, or a system of relief under which crowds pour on to works, necessitating the introduction of labour tests and every kind of inquiry, the construction of poor-houses and armies of pauper cooks, the formation of hospital camps for the sick and the infirm, and a general bouleversement of all the ordinary conditions of life? What if a few poor sickly persons do sustain life for a few weeks without a labour test. Is it worth imperial consideration, for the sake of a principle, to disorganize the ordinary conditions of a province; to enforce humiliating conditions on a mass of helpless and starving persons?

Under this system little by little the able-bodied labourers have laid by a hoard of grain, and the sick and the infirm have also from their daily rations obtained a similar surplus store on which to sustain life till the next harvest is gathered; so that when the famine is declining and agricultural prospects are fair, the village being well under control, the circle officer by a simple purwanah orders the labouring gangs to be dissolved and sent back to their homes. The village group officer is ordered to suspend the issue of rations; the relieving staff still continuing at their posts for a few weeks more in case of any sudden drawback, and as soon as the district has reached its ordinary condition the establishments are withdrawn, the accounts closed, the circle officer's bungalow sold, and the famine operations concluded.

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* I, of course, exclude those dharmsallas, such as Bod Gya, at other places on main lines of road traversed by pilgrims where rice, salt, flour, and pulses are served out to all who ask for it.

a.III. Qn. 23.

BENGAL.

Mr. Kirkwood.—Gratuitous Relief.—I venture to concur in the opinion expressed by Sir John Strachey (1861), when writing of the Moradabad relief, that poor-houses, or kitchens, should not be opened extensively, but should be limited to the chief towns of a district where supervision is constant. But I do not concur in the opinion that in such a poor-house should be assembled all who may have no other means of support, and cannot be put on earthwork. In the Moradabad poor-house some 6,000 persons were assembled—men, women, and children forming, respectively, as nearly as possible one-third of the total. The majority of these it would, I conceive, have been better to relieve at their houses, either gratuitously or by such labour as the spinning and weaving reliefs. Nor am I able to concur in the somewhat harsh doctrine Sir John Strachey then adopted, that none should be relieved who refused to come to the poor-house—pardanashins alone, apparently, being excepted. But, perhaps, this doctrine had its origin in the peculiar circumstances of Moradabad, for it is reported that "while it is said that, in " some districts, the people of particular tribes have " preferred to die at their own houses rather than accept " the relief that has been held out to them, nothing of " this kind has been seen in Moradabad. The Goojurs, " of whom in particular this is reported to have been " the case, have suffered little in this district."

Huts were, I see, provided in Moradabad poor-house, and to each person was assigned a proper dwelling-place. Near each series of huts a space of ground was marked off with bamboos, and within it food was distributed. For each workshop also there was a separate enclosure. At the entrance to each enclosure was a board, showing the purpose to which it was devoted. A separate range of huts was provided for lepers. Sets of privies for each sort of people were provided near the main enclosure. The workhouse consisted of 13 sheds, besides two rope walks forming the sides of a quadrangle 700 feet long by 700 feet broad. Two sheds were allotted to spinning, three to string-making, one to storage of paper and string, one to *newar* rope and cloth-making, one to mat-making, one to storage of grain, and several sheds for the purpose of cleaning the grain. Hospital sheds and a roomy dispensary stood well aloof. The whole thing was situated on a spot, mostly waste land and mango tope, about 2,000 feet long by 1,500 feet broad.

These are arrangements which, if the necessity for a poor-house be admitted, recommend themselves strongly, the space and accommodation being varied according to numbers. I, however, demur altogether to the assembling of such numbers, and deem that almost all these persons should have been relieved in their homes, the poor-house being kept for those who had no homes or were fit subjects for medical treatment, and were unable to do any work except such as is comprised in the cleaning of the rice for their meals, or the occasional turning of a spinning-wheel. I am well aware that that theory is not in consonance with general practice.

In Orissa, in 1866, these cooked-food relief-houses were opened on every side, and formed through that year the great measure of relief. In March 1867 we still had on the cooked-food relief lists in Cuttack district above 32,000 persons. In 1866 the numbers had been larger. A new policy came into play in 1867, and by the end of May these numbers had been reduced to 10,000. After that they gradually fell off. In November 1873, Sir George Campbell, when preparing for the coming famine, wrote—"Meanwhile, " though as regards charitable relief we are not to " commence active operations, it is most necessary to " prepare all the necessary machinery for establishing " relief-houses," and he then proceeded to direct that district officers "must especially mark out the places " and sites at which the necessary sheds, godowns, and " other accommodation for relief-houses will be " required, if the scarcity should unhappily merge into " famine." In 1874, notwithstanding that the Governments of India and Bengal repeatedly recognized that it was most desirable to prevent the congregation of large masses of people away from their homes for the purposes of relief, this relief-house system was a very general method of affording relief. Arriving in the Bhagulpore district in March, I found that the system was being extensively introduced. Somewhere about 2,000 persons were then in receipt of cooked-food relief in hospitals and poor-houses (or relief centres). More poor-houses were to be opened. As soon as fresh organization for relief was started, I began to abolish this cooked-food relief. Within two months the numbers were reduced to 1,000, and by two months later fell to 500. The numbers thus relieved were kept at the lowest possible figure, and were mostly of the classes "homeless" and "undergoing medical treatment." But in some parts of Behar, I believe, the cooked-food system was in full swing.

Again, the system of poor-houses and cooked food was very extensively adopted in Madras and Bombay during 1877. In Madras, in the middle of May, there were 103,000 persons in relief-houses; at the end of May the number had increased to 116,000, and by the end of July to 207,000. Later on, I believe, the numbers rose still higher. In Mysore, at the end of April, the number gratuitously relieved at kitchens was 87,000, and was still increasing. In the present year (1878) this poor-house system of relief has also obtained in the North-Western Provinces. Some 24,000 persons were thus receiving relief by cooked food at the end of July.

At the same time (July 1878) more than half the 77,000 persons still gratuitously relieved in Madras were in poor-houses. These poor-houses each appear to have had several hundred occupants. Without the house-to-house and spinning and weaving relief systems, which I would advocate in supersession of poor-houses, there must be always great distress among multitudes who will only resort to the poor-house system of relief when it is almost too late to save life, and among still more who will not resort to it at all. Thus Dr. Harvey (on special duty with Sir Richard Temple) wrote at the end of March 1877—"The great majority of the people in the relief camps " at Madras itself were greatly emaciated and reduced, " and had evidently endured great suffering. Many of " the Madras people seen at my first visit were so far " reduced that death was inevitable. Most of these " poor people had not been employed on relief works " or been in receipt of relief until they arrived at the " camps. Occasional isolated cases of a similar nature " have been seen in almost every district." Here is another expression of opinion, this time by Sir George Campbell, in 1874, which points to the same conclusion. Sir George Campbell, in writing of the numerous emaciated children to be seen, stated—"The Lieutenant-" Governor has already explained the extreme difficulty " of saving such children, owing to the unwillingness " of the parents to bring them to our hospitals and poor-" houses. The mothers strongly resisted staying there, " in spite of every concession and arrangement that " could be made." Sir Richard Temple, writing on the 17th April 1877 of Salem, referred to the general orders of Government as being "to collect in large " camps all those destitute persons who could be col-" lected, and to sustain in their villages those who could " not be so collected." This is exactly the reverse of what I would advocate. I would say: "Sustain in " their villages all those destitute persons who have " homes and can be so sustained; collect into small " poor-houses and hospitals only those who have no " homes and cannot be so sustained." I think the orders of the Madras Government, issued at the end of August 1877, after some months of bitter experience, are more in accord with the correct course. They enjoined that "the ultimate object of these " relief camps, as receiving places only, for people here-" after to be drafted to works or to their homes, should " ever be kept in view." Also the Viceroy, in his Minute of the 31st August 1877, wrote:—"Such " (*i.e.* gratuitous) relief may be given in the shape of " grants-in-aid of private charity in the shape of cooked

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" or uncooked food, distributed at relief centres, at " camps, or poor-houses where the recipients of relief " are housed and cared for; or (if complete means of " supervision exist) in the shape of money alms dis-" tributed to paupers at their homes through village " agencies. One or other, often more than one, of " these forms of gratuitous relief must, sooner or later, " be dispensed in every famine tract. At large centres " of population relief camps are useful, for the inmates " are prevented from wandering about the streets and " starving for want of miscellaneous alms.

"On great roads and lines of traffic out-door relief " centres are more suitable. Where a good indigenous " village agency exists it is advisable to register and " relieve, at an early stage of a famine, the helpless " paupers in their villages, so that they may be pre-" vented from starving at home or from wandering forth " in quest of charity."

I look upon this latter declaration as a most important one. Under its influence I trust it may never in the future be said, as is now stated in the question before me, that the poor-house system is the "commonest mode of administering gratuitous relief." That it should be distinctly laid down that this system of house-to-house relief is to be initiated at an *early* stage of a famine is another great gain. It has been far too frequently urged that all operations connected with State gratuitous relief must be postponed until famine has reached an acute stage,—a doctrine which implies great disorganization, great waste, and great mortality.

Even if the poor-house cooked-food system were as good in other respects as the home relief, gratuitously or by spinning and weaving employment (how very far short it falls of that standard I will not here pause to recite), it should be condemned on the score of expense, and therefore should only be had resort to on the score of necessity. In Cuttack (1867) at these poor-houses (including hospitals) the average cost per person relieved for a month was Rs. 2-7-8. This was inclusive of the cost of buildings and establishments. This figure was more than double what the spinning and weaving reliefs or the light labour (earthwork) relief cost us. In Bhagulpore (excluding cost of establishments) the average cost per mensem for persons relieved in hospitals and poor-houses was Rs. 2-4-4—a figure likewise double what any other relief cost. In Jhansi (1869) the average cost per mensem of persons thus relieved in poor-houses was Rs. 2-3. In Allahabad (1869) it was about Rs. 3-10.

If one point stands out more clearly than any other in the history of the famines of 1861, of 1866–67, of 1869, and of 1877, I think it is this—that cooked-food distribution in relief-houses is the most baneful, most demoralizing, most extravagant shape which relief operations can assume. It is not a test of vagrancy; the idlest vagrants would always be those most ready to accept of relief in such a form; but it is a test, and a ruinous one, of respectability, character, and independence of feeling. These must all vanish before it becomes accepted; these it should at all times be the object of Government to foster; these, when preserved along with life, lead to a hundred economies, and, after the time of trial is over, bring out a population in no way debased. I do not think cooked-food relief is ever (as is stated in the Government of India Resolution of the 16th January 1877) "found a useful test of actual distress." Caste prejudice will preclude many of the most deserving applicants for relief from accepting it in this form. Cooked-food relief is, indeed, I think, devoid of a single good feature, and is excusable only when famine has unexpectedly reached such a height that people have already congregated in crowds so starving that they would eagerly devour the grain raw were it given to them in that state. Large relief-houses, with the concomitant of cooked food, can only be desirable when the immediate provision of shelter and the speediest way of conveying food into the bodies of the starving are the paramount requirements of the moment. Colonel Baird Smith was quite right when, in 1861, he wrote of "that mournful prostration so common among the helpless paupers of the relief-houses." The best managed of poor houses must, in a time of famine, teem with depressing sights and offensive smells. These sights and smells, and the demoralization of a life of indiscriminate crowding together of persons of both sexes, are incidental to all poor-houses. The only way to in any way obviate them is to give the people small huts to live in, instead of huddling them together in large common sheds. Greater privacy and diminished risk of demoralization would thus be secured at a cost but insignificant when compared with the result at stake. I would also substitute raw food for cooked food wherever such centralised relief may be necessary, except in hospitals. As to the huts, their number would be diminished in proportion to the early appreciation of the approaching calamity. For if the calamity be anticipated the mass of the people might be kept at home and their houses repaired for them, or they provided with money to do so. The expense that would be entailed in thus repairing their habitations would be trifling compared with the cost of providing them with shelter elsewhere, and the expense of feeding them in their homes would be infinitely less than that of feeding them elsewhere. This village relief, providing the neediest with support in their homes by a distribution to them near their homes of cash or grain, is, in my belief, the best form of gratuitous relief. I think the results of this village relief in Cuttack (1867) and in Bhagulpore (1874), although in neither place was it in every case administered faultlessly, are of a nature to warrant my regarding that as a primary canon of relief administration. Relief is thus offered in an acceptable form; the cost is much less, for the people in their homes make their supplies go twice as far; and, if there are trustworthy and efficient distributors, the cheating and waste inseparable from centralised relief and cooked-food distribution will be avoided. But, in any extreme famine, it is certain that some will become homeless, both from their eagerness to hasten where they suppose food to be more available, and also from being ejected by those members of their families with whom they have hitherto lived, but whose narrowed means have now compelled them to regard self-preservation as the first object. For these persons, then, I would have, in certain localities 10 to 20 miles apart, according to the severity of the famine, villages built—small first of all, and increasing in size if the people flock in—just as in the case of the labour gangs.

Mr. Macdonnell.—I believe that in a system of relief in India a poor-house should play a subordinate position. It should be a refuge—a temporary refuge, and nothing more—where wandering mendicants and similar famishing waifs and strays should be harboured until arrangements could be made to send them to their former homes.

In opposing in this decided manner the poor-house system of relief administration in India, I shall possibly be exceptional; but I confess I am strongly prejudiced against that system by the experience of it I have had. I believe it to be ill-adapted to the circumstances of the country. It is certainly opposed to the feelings of the people, rich and poor, in whom the belief is almost inbred that residence in a poor-house destroys caste as well as all feelings of self-respect. I shall probably be told that this is a delusion; that rules are enforced for the segregation of castes; and that labour is exacted, no doubt, with a view of preserving in the inmates some vestige of self-respect.

All this is true; but as far as poor-house labour is concerned, I still venture to say that as an attempt to maintain a self-reliant spirit in the inmates, or as a means of recouping the cost of their maintenance, it is practically worthless. While, as far as the observance of the best-framed rules goes, I believe the object in view, namely, the preservation of the caste status of the inmates, is never secured.

The poor-house system is admittedly inadequate to meet all the wants which gratuitous charity must relieve. Cases most deserving of help—respectable families reduced to want—are never helped by it. Every one at all acquainted with famine relief work must have met many instances where death was preferable to life on in-door relief terms. You must, then, if you adopt the poor-house system, of necessity have the other system existing side by side with it. Constant difficulties will crop up when you strive to draw the line between the sphere of action of each system. This of course is not an insuperable objection; but it is an inconvenience.

The only substantial argument on which, it seems to me, the poor-house system is based is the argument of economy. But if out-door relief were carefully administered, this argument ought to lose much of its force. The only extra cost which, under the system I advocate, must be incurred, and which is not incidental to the other system, is the cost of efficient supervision over the people in their villages. This extra expense would, I believe, be made up for by the benefits which the healthier system of relief would confer on its recipients.

In fine, the system of out-door relief is in keeping with that policy of retaining people near their homes, and of preserving the continuity of village life, which should be, in my belief, the central principle of famine policy—a principle which should be observed as closely as the state of the finances will permit. The poor-house system, on the other hand, seems an adjunct to the plan of drawing people away from their homes to large works—a plan which, in my belief, unduly concentrates attention on immediate economy. That does not seem to me to be a wise policy which, as long as human life is not absolutely lost through starvation, ignores the questions of subsequent pauperism and disorganised social conditions. It seems a more far-sighted policy to prefer a less grudging expenditure with the view to securing afterwards the immediate resumption by the people, impoverished no doubt, but not disorganised, scattered, or disheartened, of their usual wealth-producing avocations.

BOMBAY.

BOMBAY.

Mr. Hewlett.—Poor-houses should be established at the zillah station where there is a civil surgeon, and at large towns where there are dispensaries, and at other points where necessary: for example, at villages along the principal lines of communication leading into the district; but each principal poor-house requires an accessory hospital. I have already recommended a relief kitchen to be established at every large work. The poor-house should always be enclosed, and by a bauble bramble fence, if possible.

At Sholapur relief-house, kitchen or poor-house I had four grass sheds, of the dimensions given in the sketch, viz., 100 feet × 20 feet, erected for 200 inmates. (*See Diagram.*)

The latrines in this instance, as the ground was not suited for trenches, consisted of rows of earthen vessels, and a sweeper was kept constantly in attendance.

The men were placed in two of the huts, and the women and children in the other two.

The arrangement of the huts must depend on the space available, but there should only be one entrance to the enclosure, and if the number of applicants is very large, only the worst cases should be admitted for shelter. A large number of poor artisans who have their own houses, and strangers who find shelter in the dharamsalas of the town, can attend as externs for food, which they should eat within the enclosure, but all should be provided with tickets with distinctive colours:—

Red, to signify that the holder is to be fed once a day.

Blue, to signify that the holder is to be fed twice a day.

Yellow, to signify that the holder is to be fed three times a day.

This point requires the careful supervision of the medical officer, especially in the case of infants and children. The children and infants of externs should also be admitted within the enclosure and fed separately from their parents, this precaution being necessary, or else the parents will eat the children's allowance of food.

All infants and children living in the premises should be under the care and supervision of a *dhal* for the same reason.

Mr. Norman.—A poor-house should be erected within easy distance of a large town, where supplies can, without difficulty, be procured. The site should be somewhat elevated, with a good supply of water at hand. In this district it has not been found necessary to enclose the poor-houses, and the expenditure necessary to enclose so large a space sufficiently would be very heavy.

I think 4,000 or 5,000 persons might, with ease, be accommodated in one poor-house, provided the site were sufficiently spacious and the water supply good. The higher castes should be separated from the lower. Families should not be separated. People coming from the same village or district should be placed as much as possible together. Single women must be placed in separate huts. Nurseries should be established for orphan children, who should be taken care of by the older women. These arrangements can easily be carried out when the poor-house consists of a number of separate huts, as is the case under the Bombay system.

Mr. Spry.—If all the conditions are obtainable, the proper situation for a poor-house would be about a couple of miles from the town which is the head-quarters of a district or taluka, and on the banks of a running stream. If a grove of trees can be found all the better, but it is best that the surrounding country should be open, so as to admit of air and to prevent nuisances being committed behind the hedges, &c. Open country besides admits of expansion.

If a poor-house is at the distance I recommend from the town, there is no need for any general enclosure; the people are not likely to try and wander much to the town, and those that do can easily be relegated back. I did not myself adopt a general enclosure, as being inconvenient and shutting out ventilation. But there should be enclosures round the hospitals, the leper sheds, the cook and store rooms, and, above all, the feeding places. Posts and rails, with babool thorn branches affixed thickly along them, are the most effectual and easily run up. I cannot give any actual area that is desirable, only that there should be plenty of space between all the sheds. I do not recommend separate huts for families; the inmates of poor-houses are prone to filthiness in the extreme, and separate huts only impede conservancy. Long sheds with thatched roofs, and mud or rough stone walls going partly up to the roofs, so as to allow of a free current of air, are preferable. The latrines should be placed at a moderate distance off and away from the water supply. They should be tended by a special staff of sweepers and labourers and be on the dry-earth principle, fresh trenches being dug as old ones become utilized. Two thousand I think is the maximum number which can be properly looked after in one poor-house. Separate sheds might be kept for low caste paupers, as also for males and females not coming with families. For the rest I would let the people settle themselves down in the sheds, only preventing overcrowding. Too much petty interference only causes irritation and does no good.

Colonel Anderson.—Ordinarily it was found in Bombay in the last famine that the lower castes, who have few scruples, and children who at all times and especially in times of need are less tied by caste bonds than their elders, were the principal occupants of relief-houses. The able-bodied and adults remained at home or went on relief works.

MADRAS.

MADRAS.

Mr. Price.—The proper position for a poor-house is from a mile to two miles outside of a town.

INSTRUCTIONS FOR FORMING RELIEF CAMPS.

In selecting a site, it is necessary that it should be high and open and with an ample supply of water for drinking and bathing purposes. There should be facilities for drainage, and the neighbourhood of native villages should be avoided.

The camp should, in the case of a first class (to contain 500), be within a rectangular enclosure, measuring 250 × 250 yards, which should be surrounded by a trench 5 × 5 feet. This trench should be lined at the bottom with prickly-pear, or thorns where pear is not available, and the spoil bank put back and sloped, a berm of 3 feet being left and also covered with pear or thorns. Second-class camps should be half the size of the above.

The ground within the enclosure should be levelled, and all brushwood, loose stones, and thorns removed. If there are any trees, the lower branches should be lopped.

Huts to accommodate 500 should be provided in a first-class camp and to hold 250 in a second. The size of each hut should be 75 × 14 feet. The side walls should be composed of 3 feet tatties, leaving an open space of 1 foot between the top of the wall and eave. The tatties should be plastered with a mixture of equal parts of cow-dung and sand, on the inner side, over which there should be a coat of whitewash, which should be applied once a week. The centre posts should be 11 feet above the ground, and 9 feet apart. The roof should be of bamboo rafters placed 3 feet apart, with thin bamboos between and bamboo reapers placed across, and the whole covered with either palmyra leaves or mats placed twofold. Where mats are used for roofing, outside ties of split bamboo should be placed along the whole length and securely fastened to the rafters inside. Similar ties should be put at intervals down the roof.

There will be ten of these huts exclusive of observation and hospital sheds placed in *echelon* 75 feet apart, and they will face east so that the prevailing winds may have free passage through them.

The flooring of each hut should be raised 9 inches or 1 foot and should be well tamped, and a thin layer of about half an inch of fine sand should be laid on top. Three small bamboo baskets of open trellis work containing charcoal should be suspended from the roof of each hut.

Surface drains should run along the sides of the huts, leading to the trenches, and the latter should have outlets to carry away the rain water. The earth dug out of these drains should be piled up against the walls of the huts so as to prevent the wind sweeping over the floor of the hut with violence.

The cost of each hut should not exceed Rupees 1-8-0 per head.

The latrines should be in three trenches each 30 × 1 × ¾ feet joined together so as to form a triangle, and should be well provided with dry earth, which each person should be made to use, and which should be stored in a shed in the open space in the centre of the triangle formed by the three trenches. The night soil should be daily removed and buried in deep pits.

The latrines should be enclosed by a wall of tatties.

The hospital shed should be of the same size as the others, but higher, and the roof should be thatched.

There should be two sheds, one for males and the other for females. The flooring should be raised and well covered with light sand.

The cholera and small-pox sheds should be built outside the camp, and their positions must be a matter of careful consideration. The size of each shed should be 14 × 12. The flooring should be raised and the roof of double matting. They should be surrounded by a trench fenced with thorns or prickly-pear, and guarded by an entrance gate which should be kept locked.

The size of the cooking-shed should be 75 × 15 feet, with palmyra leaves or thatch roof. The cooking ovens should be placed in double rows along the centre of the hut, leaving sufficient space on either side for the cooks to work.

These buildings will be on either side of the entrance of the camp, each measuring 35 × 14 feet, with a raised floor and thatched roof. The front portion of the store-shed will be occupied by the police as a guard-room, and in like manner the front portion of the superintendent's quarters will be the office.

It may be necessary to build quarters for the medical attendant, and in that case a suitable site should be selected not far from the camp: a hut 20 × 14 feet will be ample.

Dr. Gray.—A *poor-house* should be situated if possible with the following advantages:—

(*a*) In as central a position as possible in a taluk or district;

(*b*) in a Kusba village the head-quarters of a deputy collector or tahsildar;

(*c*) it should be out of or next a village, *i.e.*, on the outskirts;

(*d*) near a canal or well or tank;

(*e*) near a railway station or on a grand trunk road.

The total area of the camp for 2,000 inmates should be 255,000 square feet.

Fence or Wall.—This is essentially necessary. The fence should consist of a trench 4 feet deep and 4 feet wide with a hedge of thorns on the outer side of the trench. The best thorns for the hedge are the *prickly-pear*. In the Chingleput District camps there were no trenches round the camp. The fences were therefore exceedingly defective. In the Peapali poor-house, Kurnool District, I find this system of trench and thorns exceedingly effectual in preventing people from escaping.

The shape and material of the sheds should be the same as that recommended for a working-camp hospital. Each inmate should have eighteen square feet of space. The arrangement of the sheds should be something like what I have recommended for a working-camp.

The latrines should be placed to leeward of the camp. They should be divided into *male* and *female*, and the same arrangements should be made as those proposed for a working-camp. Between the male and female latrines there should be a hut for the storing up of dry earth. One corner of the latrine should be paved with slabs of slate or granite where the paupers might cleanse themselves after defæcation.

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QUESTION 24.—CONDITIONS OF ADMISSION TO POOR-HOUSE RELIEF.

What should be the conditions of admission to relief in a poor-house? The usual conditions are (1) *inability to work on a relief work;* (2) *willingness to reside within the enclosure;* (3) *willingness to accept cooked food. Under what, if any, circumstances may these be relaxed, or may the food be distributed without residence, or may uncooked food be given? What arrangements should be made for the admission of applicants, and to whom should the duty of selection be assigned?*

Punjab.—Conditions stated are approved. Uncooked food might be given to those who can cook it in the poor-house.

North-Western Provinces.—The conditions stated in the question are on the whole approved, but there is an inclination to relax the condition as to cooked food to meet objections on account of caste, one officer would add vaccination. Poor-houses to be managed by committees, which should regulate admissions.

Bengal.—The conditions stated in the question are generally approved, but cooked food is objected to by some officers.

Bombay.—Inability to work and acceptance of cooked food essential. Residence within enclosure advisable, but not always feasible.

PUNJAB.

PUNJAB.

Mr. Nicholl.—The condition of admission stated should not be relaxed. Uncooked food might be given to those only who are able to cook it themselves *within the poor-house.* The duty of selection should be assigned to a Government official, or a respectable citizen.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—I can suggest no other than the three usual conditions, which should not be relaxed in any poor-house supported entirely by Government.

In towns in which the inhabitants raise subscriptions among themselves an equivalent should be given from Government and also from the municipal fund if there is one, and the sum thus raised might be expended in giving, without requiring residence in a poor-house, a small dole of uncooked food to any applicants belonging to the town or neighbourhood who might be considered to be deserving of such by a committee to be formed from the respectable residents of the town.

Applicants for admission to any poor-house should be passed by members of a poor-house committee, which should consist of as many European and Native gentlemen, official and non-official, as are willing to serve, as the larger the number the less irksome is the duty. During the hot weather and rains no applicants should be admitted who had not appeared in front of the entrance of the poor-house before 8 A.M. In the winter 9 A.M. might be fixed as the hour after which no applicant would be passed.

Any member of the committee or the superintendent of the poor-house should have power to order the admission at any time of any applicant whose case appeared to any of them sufficiently serious as not to admit of delay. Such an applicant should be duly passed by the committee on the following day.

Mr. Story.—Under all circumstances residence within the enclosure for at least 24 hours must be compulsory. I would not in cases of high-caste men insist upon their willingness to accept cooked food. Men of this class might be told off to assist in the cooking as a condition of getting uncooked food. Even if the little they were able to do was merely nominal it would be something towards earning a livelihood. If the famine was severe, admissions to the poor-house should be allowed at least twice a day, say 10 A.M. and 5 P.M.; exceptions to this rule allowed only in cases where the applicants were in a state of extreme exhaustion from want of food. Cases of this kind should be admitted at once and placed in a hospital under the charge of the native doctor. The committee of management of a poor-house should consist of at least eight or ten visitors, European and Native. It should be the duty of the visitors to undertake the admission of the applicants. None to be admitted without their permission, except in the special cases above referred to.

Mr. Stoker.—I would add two conditions to those specified in the question, viz.—

(1.) Vaccination of every applicant who had not been already vaccinated or had small-pox.

(2.) Segregation of the sexes.

The first will, I think, commend itself without any remark.

For the latter there are two reasons. It is a condition which will facilitate discipline and order, and at the same time render the poor-house less attractive, and these are the two points to be kept most prominently in view in imposing conditions of admission. The poor-house is not designed as a place of residence for people who have other means of support, but prefer a more dignified or comfortable maintenance at the hands of the State. And this is a precaution which would help to keep such people away. It is therefore worthy of adoption.

Mr. Lumsden.—Applicants should be examined every morning by the Civil Surgeon or Assistant Surgeon and passed on to the poor-house or sent on relief works.

Applicants arriving at the poor-house after the hours fixed for admission should be allowed to remain in an enclosure outside the poor-house until next morning, and any applicant in absolute want of food should get the usual ration; but no applicant should be brought on the poor-house register or admitted inside the poor-house proper except he has been passed on by Civil Surgeon or Assistant Surgeon.

BENGAL.

BENGAL.

Mr. Toynbee.—I would only retain the three conditions laid down in Question 24 in the case of very severe and widespread famine. If really trustworthy officers were available, and in sufficient numbers, I would supplement poor-house relief by a weekly distribution of uncooked food to those whose circumstances and position were such as to make them prefer death by starvation to the loss of caste and its consequences, which resort to the poor-house would involve. The mode to be pursued would be that adopted in Pooree district in 1867, and called " village relief," and described in the answer to Question 30 (see also Mr. Geddes' compilation, pages 201–208). The admission of applicants would, in the first instance, be made by the Darogah, Superintendent, Mohurir, or other officer in immediate charge of the poor-house. He would be guided by the conditions mentioned in Question 24, and by the physical appearance of the applicants, whose names should be entered in a register to be kept for the purpose. His judgment and honesty would be checked as often as possible by the relief officers of superior grades.

Mr. Marindin.—In my experience of famine relief in the Durbhunga district in 1874–75, poor-houses were principally provided for persons who had wandered from their homes, and either from extreme age, extreme youth, or debility, were unable to work on relief works. When practicable, such persons were sent on as soon as possible to their homes to be relieved in their villages. There was a native doctor in charge of the poor-houses in the circle under my charge who was competent to decide in the first instance if the applicant should be admitted to the poor-house or sent on to the works. Residence and the acceptance of cooked food by the inmates were insisted upon as a rule, the exception being in case of children in arms, whose mothers could and did work. When persons were found upon the works in an extreme state of debility, they were sent to the poor-house till they recovered strength. Women with especially emaciated children in arms were allowed to take them to the poor-house in the morning, before going to work, for some extra nourishment like sago and milk.

Mr. Kirkwood.—Although I fully admit that the circumstances which beset us in Orissa in 1866—the sudden recognition of a great calamity only when its crisis was reached, and the absolute deficiency of grain at our disposal—may be held as a justification for applying such a rough-and-ready test as cooked food to all those applicants for relief who could not afford to purchase at the scanty stores of grain we offered for sale, and also to justify a system of relief-houses which did not render residence compulsory, and where no test for admission to the meal was enforced beyond that afforded by emaciation and readiness to partake of the food offered, I cannot think that when, as now-a-days must be the case, a famine is foreseen, any such justification would exist. Generally, under such circumstances as those described by the Orissa Famine Commissioners, no tests for admission to relief can be appropriately applied; certainly not those of residence or of cooked food. But, if the supply of grain at the disposal of the afflicted district is absolutely inadequate, even by the most careful economy, to maintain the lives of the population, and an extreme stage of distress has been reached unawares, then, perhaps, until further supplies are made available and some establishments have been organized, the test of cooked food may be justifiable But I do not think that residence should under any ordinary circumstances be dispensed with, or cooked food be insisted on; for I look on these poor-houses (or relief villages) as things that should be designed solely for the reception of homeless wanderers. Moreover, I think that the opinion that cooked food is the means of giving gratuitous relief least liable to abuse is not supported by facts, and that, while noting that cooked food is a method of relief common in native charities, it would be well to bear in mind the degraded sort of people on whom that charity is in ordinary times bestowed, and the very much higher grades of social life which stand in need of gratuitous aid in time of a famine.

BOMBAY.

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Mr. Hewlett.—If there is a very large number of indigent people requiring food, it is in my opinion impracticable to provide shelter for all. As mentioned in the last paragraph, many of the artisan class whose occupation is temporarily in abeyance require food, but can get shelter in the town, and strangers can be largely accommodated in dharamsalas, but the worst cases, who cannot walk to the poor-house, should be admitted into sheds erected for them. I would make the acceptance of cooked food the condition of getting relief. All persons sent in from villages or picked up by the police, or who voluntarily come, should be received. On the visit of the medical officer these should be divided into classes: so many to go to the relief hospital, so many to be sent to the relief camp, and so many to be admitted into the poor-house until fit to go to the relief camp. This was the plan recommended at Sholapur. If the number of applicants at the poor-house will admit of the arrangement, I think all should be hutted inside the enclosure; and if there is no relief work near to which they could be sent, I think those able to work should be employed at such work as the improvement of the sanitary surroundings of the relief house and of the village or town, in planting clumps of trees, in filling in hollows, and levelling, either up or down, places requiring it, in cutting prickly-pear, in generally useful works to improve the neighbourhood, such as road making, deepening a tank, &c.; for others, not able to perform such work, cotton-spinning, rope-making, weaving, whilst others could be engaged in the service of the kitchen as cooks, or in grinding corn, in fetching water and wood, in washing clothes, in conservancy of the enclosure, &c. The non-workers would consist of the infirm, blind, crippled, and very old or very young. Some of these should be employed in taking care of children, &c.

Mr. Norman.—In my experience it has not been found necessary to relax any of the conditions mentioned except in the case of the very old and helpless who could not be moved to a poor-house and therefore had to be relieved in their own villages. In such cases, uncooked food had occasionally to be given, because arrangements could not be made at the smaller villages for cooking it. In future, however, I am of opinion that persons unable to move should be carried to the nearest poor-house and compelled to reside there. The acceptance of cooked food is most distasteful to the higher castes, but by no other means can the numbers on gratuitous relief be kept within bounds. To the superintendent of the poor-house must be assigned the duty of admitting applicants. They should be inspected every morning and at once classified. The able-bodied, if in need of food, must be fed and sent off to a relief work at once, arrangements being made for feeding them at certain fixed stations *en route*. This was done during the last famine. A few able-bodied men and women must be retained to do the work of the camp, and they should receive a slightly larger ration than the other inmates,

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Mr. Spry.—Inability to work on a relief work should be a *sine quâ non* for admission into a relief-house. If enclosures sufficient to accommodate all the people properly can be made, residence may be insisted on, but to erect sufficient enclosures in extreme famine would be tantamount to erecting several fresh towns and villages. Willingness to accept cooked food should be certainly insisted on under any circumstances. Morning and evening at an appointed spot, say the gate of the relief-house, the civil officer or manager of the relief-house should select out of the applicants those entitled to admission. If there is a Relief Committee, one or more members might also attend by rotation.

Mr. Symonds.—The ration in the relief-houses was in my opinion quite sufficient. At first we had open relief-houses as centres of circles of ten villages or so, without the condition of residence. Later on we had enclosed camps, which were much less satisfactory. At the small open relief-houses the people used to live in the central village and receive cooked food, which cost hardly anything more than the cost of the raw grain. They were under the patel, kulkarni, and village inspector. Those whom we could not move were relieved in their villages; the rest were sent, either on foot, or in carts if they could not walk, to the central relief-house. They would have much preferred to be in their villages, and it would have cost less to relieve them there, but then we should have lost the advantage of weeding them. Sometimes when a man had come his twelve miles to the central relief-house and satisfied us that he was really in want, we sent him back to his own village, knowing he would be happier there. It would be quite impossible to administer village relief without such a test, relying only on the patels and kulkarnis; we should be flooded with crowds of people who would be glad to get relief at home, but would not go any distance for it. At the present moment thousands of people would gladly accept village relief, and the patels would put them on it if left to themselves.

MADRAS.

MADRAS.

Mr. Price.—I do not know of any other qualifications than those named. They cover everything excepting, perhaps, dangerous emaciation, the existence of which necessitates one of two courses, viz., taking the individual into the poor-house whether willing or unwilling, or leaving him or her to die. I would not relax the conditions, excepting in the case of persons who have wandered a distance from home, or have straggled when bodies of coolies are marching, &c., and are finding their way back to their residences and cannot get employment. I do not approve of the distribution of cooked food without residence, or of uncooked food. Theoretically it may look possible, but practically it gives rise to so much fraud that such a step is unadvisable. If people choose to wander, they must, in my opinion, take what the State offers, and this in the case of poor-houses was, during the famine, good shelter, good food, and medical help, subject only to such rules and restrictions as were necessary in order to carry out sanitation and discipline.

The arrangements for admission in the Cuddapah District were that the superintendent and medical officer saw applicants who came to the camp and decided upon those to be received, and that all persons sent by the police, village magistrates, tahsildars, and relief officers were taken in. Where the relief officer looks properly after his superintendents they can be safely trusted.

Mr. Longley.—There are two classes of admittants—those voluntarily seeking it and those sent into camp as the only means of saving life. The conditions of admission should be those stated in the question, and will only affect the former class of admittants, the latter having no choice in the matter.

The first *two* conditions named in the question should, under no circumstances, be relaxed, but there may be exceptional cases where it is found desirable to give uncooked food. As a rule, however, the conditions should be enforced.

Applicants should be admitted at all hours of the day by the camp master who should reside at or in close proximity to the camp. The duty of selection should be assigned to the medical officer in charge of the camp.

Mr. Crole.—The only exception made is in regard to accepting cooked food. Paupers of the Brahmin and Veiesya castes receive the ration raw, and are allowed to prepare it themselves. Residence is never dispensed with. The rule could not be relaxed in this respect. It is a never-failing test.

MYSORE.

MYSORE.

Mr. Ricketts.—*Gratuitous Relief.*—The conditions of admission to relief in a poor house may be relaxed in the case of parents with large, and it may be weakly families; also where a family could struggle on if one or more weakly or perhaps useless members were helped, and without which aid the whole family as having to support said members must succumb ere long. Caste prejudices also prevent many persons entering a poorhouse on pain of being put out of caste, *i.e.*, social degradation, and worse in several cases to the sufferers than death. Again, many of the more respectable classes and gosha women prefer starvation to going to a poorhouse. In all such well-inquired-into cases raw food should be given without residence. If the poorhouse be of such a nature that due and feeling provision is made for caste and families, then this relaxation of condition of residence would only be exceptional, but more frequent where poorhouse inmates were more indiscrimately provided for. Applicants for admission should be looked to three times a day, or even oftener when necessary, by the superintendent, and his action should be supervised by the civil officers, *i.e.*, amildar, special relief officer, or assistant or deputy commissioner.

QUESTION 25.—COMPULSORY DETENTION IN POOR-HOUSE.

Under what circumstances does it appear desirable that entry into a poor-house should be made compulsory on persons who appear to be starving or to be in such a state of want as to show that relief in some form is essential to the preservation of their lives? and under what circumstances would you allow them the discretion of refusing to submit to this? If compulsion is used to take them in, what steps are required to ensure their stopping there? How should such a rule be applied to vagrants, and how to persons on relief-works, or seeking relief otherwise? Does it appear necessary or expedient to obtain legislative authority for such action as may be desirable in these respects? If so, suggest what seems most suitable. Would there be any special objections to such legislation, having in view the risk of exciting fears in the population, or for other reasons?

Punjab.—Starving people should be taken to the poor-house. Legislation not necessary.

North-Western Provinces.—Some officers are for compulsion in case of unprovided wanderers and beggars, others against it, and some approve of legislation, others disapprove.

Bengal.—Entrance into a poor-house may be made compulsory on wanderers and beggars, but not on respectable poor. The opinion is against legislation.

Bombay.—All vagrants and manifestly starving people should be compelled to go to poor-houses, and legislation on the subject is desirable.

PUNJAB.

PUNJAB.

Mr. Nicholl.—A person in a starving condition should be taken to the poor-house, unless some friend or relation came forward and engaged to support him; but once in the poor-house, he should not be allowed to leave till restored to strength; then he might be allowed to leave for a relief work, or discharged and allowed to shift for himself. It is a very easy matter to keep a starving man in an enclosure. With healthy vagrants and persons on relief works or mendicants the matter is different; these it is difficult to keep on works if they are inclined to leave. I do not think, however, that legislation is necessary.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Colvin.—I would allow no discretion to a starving incapable man of refusing poor-house relief, unless of the middle or upper classes. I treat all such as criminal lunatics, and bring them in by force. Once in, it requires force to eject them. Yes, I would certainly have legislative authority for the purpose. I see no risk or fear. All that is necessary is a discretion to the magistrate of the district to issue orders for the sending in of this class of people when in danger of starvation, if they belong to the labouring classes.

Vikar Ali Beg.—Starving people are always willing to be admitted into a poor-house, and for preservation of lives the police and tahsildars throughout the district should be ordered to send all such persons. It is not necessary to obtain legislative authority on this point, because I have seen, both in this district and Gorakhpur, that starving people consider it a great blessing to be admitted in our poor-houses, and if the poor-house was constructed as described in para. 23, there is very little or no fear of desertion, provided that one or two watchmen are employed in each direction.

Mr. Sandys.—All persons found wandering about and begging, as well as those who had come to the relief works and were too weak or young to perform even a light task (except in the case of very young children whose parents or relations were employed on the work, they should be sent to nurseries which should be opened at each work), should be compelled to go to a poor-house unless they agree to return at once to their homes, or if they consented to do so and did not go. A sufficient number of chaukidars must be entertained to ensure that those persons compelled to go to the poor-house, as well as the other inmates, remain there.

It is expedient that magistrates should have legislative authority to compel the persons mentioned above to go to a poor-house. A short Act might be passed authorising the Lieutenant-Governor to invest all magistrates with compulsory powers as soon as it was necessary to start a poor-house in any district. By such legislation there would be no risk of exciting the fear of the population of this district.

Persons in want who do not leave their villages should not be compelled to go to a poor-house unless they refused to obtain relief at the nearest relief camps. When the number of such becomes large, a system of village relief will have to be organized.

Mr. Kennedy.—It does not appear to me desirable under any circumstances to make residence in a poor-house compulsory. The paupers resident in a poor-house are practically demoralized, being rejected as outcasts by their neighbours, having cast off all sense of respectability or shame, demoralized by want of food, and the mental imbecility which attends starvation, and learning in the poor-house to disregard all ties of family; it is not desirable that persons should be compelled to enter such a place. In one case I directed a girl who had attempted to drown herself on account of hunger to be sent to the poor-house, but I can sympathise with the request made by her blind father and her miserable mother that she might be spared the indignity. It was for a long time believed in the district that all the inmates of a poor-house were to be first made Christians, and then transported beyond the seas. Even after this idea was dispelled, the mass of professional mendicants preferred their own independence with the prospect of starvation. There does not appear to me any object in compelling this class to enter the poor-house, and even if they were compelled to enter, it would be impossible to keep them there; thus the two classes of habitual mendicants and of respectable persons reduced to destitution are both unfit objects for compulsion. It would shock native morality less, and would perhaps be more feasible, to oblige mendicants to labour on the relief works. The only case, however, in which I should regard such a measure as allowable would be when the number of mendicants was so great that their presence began to demoralize the well-to-do population. The present method pursued in this district is to avoid compulsion and to open wards in the dispensaries for the worst cases.

NORTH-WESTERN PROVINCES.

Mr. Wall.—If compulsion be necessary for vagrants and others, which I doubt, there is I think no need whatever for legislation. Legislation would be a matter of delicacy, and a mistake altogether. I would use compulsion if necessary. A strolling beggar is not likely to bring an action for false confinement. Such confinement would not be looked upon as a hardship by the mass of the people. You would have public opinion on your side, even though you transgressed strict law. One ill effect of such legislation would be that it might be the beginning of a poor-law system—a matter to be shunned, not courted.

Mr. Lumsden.—I would certainly in famine times make entry into a poor-house compulsory in the case of anyone found in a manifestly starving condition, without any means of subsistence and unable to earn it on Government relief works. There seems to me to be no alternative. Government *cannot* undertake to provide the means of subsistence to starving people *scattered all over the face of the country.* Such people *must* be concentrated at convenient centres, relief camps, or poor-houses, to economise time, establishment, and cost of distributing relief. It is futile for Government to attempt to give relief to the starving poor at their homes in their villages. If Government is not prepared to make entering the poor-house compulsory in such cases as I have alluded to, it must be prepared to see many starve and die. I am distinctly of opinion that poor-house relief should only be given to non-residents in the case of indigent *parda-nashin* women, and perhaps a select few indigent native gentlemen in reduced circumstances.

I don't think legislative authority necessary; such legislation might have an unsettling effect on the native mind. It would be much better by an executive order to give the necessary authority to the local officers whenever the emergency arise.

BENGAL.

BENGAL.

Mr. Barlow.—I have, in my answer to Question 7, Chapter II., stated what, in my opinion, is the special field for "poor-houses," so called. I think it would be an unnecessary hardship to shut up every person in an essentially starving state in one of these places. I look to the establishment of "relief centres," which grant out-door relief, to preserve the lives of reduced persons, other than vagrants, and restore them to a condition when they may be drafted upon works. A multitude would be thus provided for who would probably resist going into the poor-house, and by so doing might provoke complications.

From relief administered to respectable persons in their homes by means of house-to-house visitation, down to relief centres and poor-houses, embraces a wide field; and taking into account also various kinds of relief works, it may fairly be said that no applicant could present himself for whom the relieving officer could not provide a means of relief that would be free from reasonable objection as regards the individual's circumstance and condition. The question asked seems to imply this point. If persons urgently need relief, but will not accept it upon the terms or in the form in which it is offered to them, as being suited to their case, what is to happen? Are they to be allowed to exercise their discretion of refusing, with the probable result that they will die? I think the answer to this view must be given in the affirmative. The burden which the State undertakes when it offers relief upon reasonable terms to all who will accept it is almost unmanageable. To recognize the principle that people may demand relief upon their own terms would make it unsupportable. It is probable that the latter plan might tend in the end to dissolve the whole system of relief by reason of the demoralization of the people, as well as the inability of the State resources to bear extravagance and waste. The only distinction as regards applying the rule of compulsion to vagrants that occurs to me is the possibility that in the times of distress large bodies of these people congregated in towns might refuse relief, and by plying their trade of begging become a public nuisance. I do not think experience shows that there is any great risk of such a state of affairs really happening. Government officers would be active to prevent it. The public would certainly support their efforts, and vagrants as a rule are found willing to accept relief. There seems to be no necessity for legislation on the subject.

Mr. Hodgkinson.—Professional beggars and vagrants who appear to be starving should be made to enter the poor-house whether they like it or not. As a rule they are too willing to resort to it; few will require watching to keep them there. Members of the lower castes may also be similarly treated in extreme cases, and invariably when abandoned by their friends. The real difficulty is with paupers of the respectable classes, who will not apply for relief in any stage; they must be sought for and relief brought to them. To force such persons, particularly females, to a poor-house would be simply to ensure the death of many of them. There are also many who come to relief works who of themselves would decline the poor-house, although physically unfit for work and requiring attention and nursing. The objection would be often removed if a complete distinction was made between a poor-house and a hospital. It would be often easy, with very little compulsion, to induce a person to go and remain gladly in a hospital who would shrink and take the first opportunity of escaping from the poor-house. Legislation is unnecessary. In trying times the law must be relaxed, and it is on the whole far better to leave it to the discretion of the officers responsible for the completeness of the relief to decide how far compulsion may be used, than by legislation to lay down hard and fast rules which cannot possibly be suitable to the whole of the country, or review all the possible circumstances which may arise.

Mr. Toynbee.—I would only make entry into a poor-house compulsory in the case of starving persons found wandering about the country, away from their homes. If the poor-houses already established were managed with due regard to caste prejudices, as far as such regard could reasonably be shown without pampering the inmates, no vagrant found in a weak or starving condition could have any reasonable ground of refusal to go to them. At first I would make each case of refusal a subject of special inquiry and orders. If such cases began to increase I should take it as a sign of the increase of distress, and should conclude that the time was come for the introduction, as far as possible, of the village relief mentioned in the answer to the previous question, with a view of keeping people of the better classes at their homes, and of preventing overcrowding at the poor-houses. It would be extremely difficult, if not impossible, to compel such persons to remain at any poor-house against their will. Either the enclosures would have to be very large or a large and separate watch and ward establishment would have to be kept up. In Pooree, in 1867, it was found quite impossible to check the wandering habits of paupers. The only form of compulsion practicable would be for relief officers and the police to take to the nearest poor-house every person found wandering about begging or otherwise seeking relief and incapable of labour. Legislative action is not, as far as my experience goes, necessary. Compulsion beyond the point indicated above, and forced detention in a poor-house, if it were practicable, would, in my opinion, be unnecessary, as tending to alarm the people and to carry State interference beyond a point justified by any circumstances that ever have arisen or are likely to arise. It would lead to the utter demoralization of the people, and the financial ruin of the Government, if the distressed classes were to be allowed to dictate, or to appear in any way to dictate, the form of relief to be given to them.

Mr. Marindin.—When poor-houses are only established for the reception of wandering beggars unfit for work I do not think compulsion would ever be required to induce persons to accept relief at them. I never remember any such case. To keep them inside the poor-house until it was thought proper to let them go might require compulsion in some cases, but any such person refusing to remain might be legitimately treated as a vagrant, and dealt with as such by the nearest magistrate.

Compulsion upon the people generally should not be resorted to unless their refusal injuriously affects the rest of the public. For instance, a large number of persons begging about among the relief camps would tend to throw the burden of supporting them upon persons who might barely be able to support themselves, or to introduce sickness into the camp, or expose it to thefts. I should deal with such persons as vagrants, and offer them the choice of accepting relief in the poor-house or being sent to prison. This seems a matter with which the local authorities are competent to deal under the law as it exists without special legislation.

Supposing, however, poor-houses to be the only channel of gratuitous relief, should the starving population unfit to work be compelled to enter them? I think not; under the existing law it would be illegal. If special legislation were resorted to, circumstances might arise in which it would be very difficult, if not impossible, for the local authorities to put the law in force. The measure would seem a tyrannical one to many who, from feelings of self-respect or other motives, had held back from entering the poor-house; and the knowledge that they could be compelled to do so would make even those hitherto willing to enter the poor-house hesitate. Such feelings, especially when a Government order is concerned, are very infectious, and it is quite likely that so many of the population would determine to disobey the law that it would be impossible to enforce it against them. There are many persons who would in time of severe famine be in need of gratuitous relief, and, without belonging to the highest castes, might very properly shrink from the degradation of entering the poor-house. To compel such persons to enter a poor-house against their will would be an act of despotism which I cannot see any justification for. Such legislation would show that Government had adopted a mode of relief from which a large portion of the population were naturally excluded, and that, to save the scandal of numbers of such dying of starvation, they were to be compelled by a penal law to accept a form of relief they would otherwise refuse.

How are the authorities to determine when recusants are sufficiently near starvation to be fit objects of compulsion? and supposing they refuse to eat when within the poor-house, how are they to be dealt with then? There is ample scope for oppression by petty native officials under such a law. The legislation proposed is objectionable on all or any of these grounds, viz., that the measure is one it might be impossible to carry out at all; under favourable circumstances even it would be very difficult in its application; it would be tyrannical towards those whom it is intended to benefit, give opportunities for great oppression, and be virtually an acknowledgment by Government that their system is not adapted to save the life of a very large class among the people.

Mr. Kirkwood.—I would never make entry into a poor-house compulsory except in the case of emaciated homeless persons, who have no friends to take them in, and who are evidently starving because they fail to procure sufficient sustenance elsewhere. These, when they have regained sufficient strength, should be sent on to the nearest suitable relief work. All orphan or deserted children under 12 years of age should be sent to orphanages whether they like it or not; but they should be restored on any person appearing to claim them, who may show a good title and may have the means of affording them support. I certainly do not recommend any law being passed, such as is suggested in this question; that is, generally speaking. But I should like a provision which would render it unnecessary to restore a deserted or orphan child to any prostitute or person of notoriously immoral life who may establish a claim to it as a relative.

BOMBAY.

Mr. Hewlett.—I think all persons found in villages in a state of starvation should be sent to the nearest relief-house, and kept there until the medical officer decides whether they should be admitted into hospital, sent to work, or kept in the poor-house. *Legislative action will be necessary for this.* District officers were in some cases averse to exercise force not given them by law. I believe that all reasonable people would approve of this action, as it is simply taken to preserve life.

Mr. Spry.—However desirable it may be for their own preservation to compel people to go to relief-houses or to works, the doing so is scarcely justifiable without legislative authority, where the objection to accept such relief arises from what we look upon as caste prejudice, but what the people consider a matter of religion. I think any legal enactment would be regarded with great mistrust. But where the objection springs from indolence, apathy, or such causes, a compulsory law would be of advantage, and I think generally appreciated. Without a law no one can be detained on relief, but with it the matter would be easy.

Mr. Charles.—I do not think it would be advisable to insist on anyone going to the poor-house who had scruples (well founded) as to his caste and position being lost by going, even though their lives were endangered by not going.

But, on the other hand, all vagrants, and persons such as labourers who object chiefly because they dislike the food and discipline of a poor-house, should be compelled to go, as their lying about in a helpless condition leads to disorganization among the other labourers.

It seems certainly expedient and necessary to obtain legislative authority. Much difficulty was felt in the late famine for want of legal power to deal with obstinate and lazy persons, who repeatedly gave trouble by leaving works, and being found so reduced that they had to be fed up in poor-houses before they could be sent to works again. The only solution found for such cases was that officers had to take upon themselves the responsibility of keeping such persons in what was practically illegal confinement.

The provisions necessary are—

(1.) Power to detain all persons whom the civil officers may think unable to maintain themselves, under a guard, or, if necessary, in a building or inclosure.

(2.) Power to punish incorrigibly idle and badly behaved or insolent persons, by summary punishment of a few stripes with a light stick without any trial by the civil officer. A certificate or order by some person acquainted with the previous desertions of work, &c. by the person to be confined, might perhaps be required before he could be put into the class of persons to whom the provisions of the law should apply.

Colonel Anderson.—When once a state of famine is proclaimed, no discretion should be allowed to manifestly starving people; they should be kept within an enclosure by force. All vagrants and persons without subsistence should be interned by compulsion. Legislation should be provided to meet any difficulties unprovided for in the present state of the law. Such might be made to come into force specially at any time and till any time notified by Government. There would be no fear excited by such legislation if it occurred in quiet times in anticipation of being required.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.—As long as we have the responsibility of using our individual discretion, executive officers will act promptly, effectively for the saving of life, the mitigation of suffering, and the public welfare, and discreetly; and any trifling mistakes we might make would no doubt be condoned by public opinion and by our superiors. But legislative limitations of his discretionary powers might place a zealous officer intent on saving life and mitigating suffering, at a time when his whole energy and time and care should be devoted to these objects, at the mercy of any pettifogging pleader or beggar.

I would rather stand on my responsibility to my superiors, and to public opinion, than be hampered with laws and rules.

If legislative action is necessary (and I think it is necessary), it would be in the direction of allowing the impressment of labour and carriage for food supplies or for the sick and infirm. I have seen the best efforts of officers thwarted to a grievous extent, by the haggling of cart-owners and the like for shamefully extravagant rates, at a time when the saving of human life was the object aimed at. In the marching of troops, when the destroying, not the saving of life is in view, the requisite powers are given to us. At present, when an emergency arises, cart-owners know that the public officers must assent to any degree of extortion on their part. Between special correspondents and shrieking but foolish arm-chair newspaper philantrophists, insisting that executive officers are to be held personally responsible for any deaths from starvation, and those who, from greed, combine to extort public money under this pressure, the position of a district officer is far from being an enviable one.

MADRAS.

MADRAS.

Mr. Crole.—When the lives of paupers are endangered owing to their neglecting or refusing to have recourse to the relief-camps, they must and they actually are taken there by force. The fences are impervious, and there are police and camp peons, who would prevent escapes. Such cases are, however, not numerous, and mostly occur in clearing towns of beggars, who prefer loafing about on the chance of picking up something, however little, to living in a relief-camp. Their condition, of course, goes from bad to worse, until the time comes when it is necessary to preserve their lives in spite of themselves.

Mr. Longley.—Entry into a poor-house should be compulsory in the case of all persons unfit for labor through starvation or disease, and who have no homes or relatives able to support them, and who have no ostensible means of livelihood. No discretion should be allowed to such persons of refusing to submit to this.

All camps or poor-houses should be *fenced* to prevent the escape of the inmates. Suitable guards should also be appointed—police for the entrance, and paid watchmen or taliaries to guard the enclosure.

This rule should apply to vagrants in the event of their being unable to travel, in which case they should be retained in the camp until either fit for labor or to return to their villages.

It should only apply to persons on relief works, who either fall sick or become too weak for work, and should not apply to persons seeking labor-relief.

Legislative authority for such action is quite unnecessary. The want of it has not been felt throughout this famine. The existence of such an authority would, beside exciting fear in the population, also lead to abuse on the part of subordinate officials.

Mr. Price.—The question raised is one entirely of State policy. I think that where the Government enter into relief operations on a wide scale, and with the professed intention of saving as many lives as possible, persons whose condition obviously shows that they are in want of careful watching, feeding, and medical attendance ought to be forced to enter poor-houses. There can be no other means of saving their lives. Village relief will be of no avail. These cases comprise those of what I should call dangerous emaciation. I would allow others, not in a dangerous state, who were unfit to work, to receive relief in their villages. The only steps necessary to take in order to prevent paupers escaping when once put into a poor-house is to enclose it properly, have as few outlets as possible, and keep these well guarded. We lost exceedingly few from the Cuddapah camps, and when an escape took place it was more the result of a sleepy watchman than anything else. I think that the dangerously emaciated only should be *forced* to go to a poor-house. This was our rule in Cuddapah. When inspections of gangs on works were made, the "very bad" were all sent into the relief-camps. Doing this was of course illegal but highly necessary. I consider that a short Act should be passed rendering it lawful for the local government, when the condition of the country is such that poor-houses are necessary, to empower any magistrate or other official or person as may seem fit to, at his discretion, cause any individual whom he may consider to be in a dangerous state of emaciation, but who is unwilling to enter a poor-house, to be forcibly removed thither and detained until sufficiently recovered to allow of his discharge. I do not think that there would be any objections to legislation of this sort. I believe that the people, excepting the agitators, would not trouble themselves in the least about it.

Mr. Oldham.—I do not advocate any systematised or legalised compulsion, nor do I see the necessity for any legislative enactment. At present the vagrant stragglers who are picked up in the bazaars are carried off to the relief-camps by a show of authority if not by actual force. They would prefer an uncertain existence by roaming about the bazaar, and stealing and begging, to the discipline of the camp. But then there is always the power existent to arrest such persons under the law as vagrants, and nowhere in India or elsewhere that I know of is there any difficulty in dealing with this class as they are now dealt with.

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Madras.

Captain Awdry.—With regard to making it compulsory for a starving man to enter a poor-house or relief-camp I would recommend legislation in regard to the vagrant and professional beggar class, and if any such are found begging they should, I think, be shut up in a closed camp and fed on the barest subsistence.

With regard to other than professional beggars, I think it would be a mistake to *compel* any man to live by coming to camp; in all such cases the individual should be most carefully warned of the relief which he can obtain if he chooses to live, but as famine may in a certain sense be considered as an effort of nature to get rid of over-population it appears to be straining philanthropy a little far, perhaps to the detriment of others, to shut a man up compulsorily and *make* him live where he refuses to do a simple act by which means of life are placed before him by Government.

Major Baynes.—The absence of a Vagrant Act affecting natives renders legislation regarding the treatment of these classes most urgent; it was impossible to legally carry out the orders of Government during the last famine. Officers were told that such a person must do this and such an one must do that, but the proverb anent taking the horse to the water holds good, and we were obliged to take the most arbitrary steps to save people against themselves.

MYSORE.

Mysore.

Mr. Ricketts.—The answering of the first part of this question depends in a measure upon what consideration is shown to families and caste prejudices in the poorhouse. I think, however, on the whole that only persuasion short of actual compulsion should be used. I have been myself told by sufferers that, if sent to a poorhouse, they would run away from it, and I do not see how this is to be prevented, save by a system of guards and inclosures as expensive as feeding such persons outside of the poorhouse would be. Regular vagrants I would not deal so tenderly with, and legislative authority should be invoked authorizing a magistrate or bench of magistrates to make an order for their residence in a poorhouse when convicted of vagrancy. The term "vagrancy" should, of course, be first legally defined. As regards "habitual deserters" from relief works, I have already recommended legislative interference; here, too, properly defining the term.

In the two cases above put there would be no special objections to such legislation, having in view the risk of exciting fears in the population.

QUESTION 26.—RATIONS.

Ch. III. Qn. 2

What ration should be given to the ordinary inmates of a poor-house, and what special diet to those who are much reduced by innutrition? Have you any experience of the effects of the ration for adults which consists of 1 *lb. of raw flour with condiments? What is the proper quantity of condiments? State the results of your experience as fully as possible, whether this ration has or has not shown itself sufficient to support life.*

Replies not summarised.

PUNJAB.

Punjab.

Mr. Nicholl.—Persons reduced by innutrition should be treated exceptionally on a diet of milk, rice and dál till their strength is restored. One lb. of raw flour with two or three ounces of dál or vegetable and ¼ ounce salt is, in my opinion, ample to support such persons as would seek the shelter of the poorhouse, who would have little or no labour to perform. My experience tells me that a native will live for a considerable time on from 8 to 10 ounces parched gram.

Mr. Benton.—The quantity of food given at the Karnál Municipality poor-house is as follows:—

Per Man	-	8 chittacks of atta	together with a little salt.
„ Woman	-	6 „	
„ Child	-	4 „	

As the recipients take it away and consume it at their own homes, it is impossible to speak as to its efficiency or otherwise.

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Dr. Jackson.—In the Sahàranpur poorhouse, which was open in April and May, the following was the scale of allowance of food:—

		Flour.	Dál.
To adults of both sexes		8 chittacks,	1½ chittack.
Children above 10	-	6 „	1½ „
„ below „	-	4 „	1 „
„ in arms	-	2 „	1 „

Experience proved that this allowance was ample in the case of the weakly paupers, from whom only a very small modicum of labour, and that of the lightest character, could be exacted. The problem was not to establish a scale of dietary by which emaciated human beings might be fattened in the quickest manner, but to fix a minimum scale to avert the worst consequences of famine, and to put the inmates in such a bodily

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condition as to permit of their being draughted to the relief works or employed on agricultural labour, should a demand spring up. The scale was sufficient for this purpose, as from time to time those who had visibly picked up were eliminated by myself from the poor-house. I have no statistics to prove this fact, but it was patent to all the gentlemen who were engaged in the supervision.

Mr. Sandys.—The rations at present allowed by the Government of these provinces are, I think, quite sufficient. I visited the poor-house daily between 17th September to 16th October 1877, and again when re-opened between 17th December 1877 and 7th April 1878, when not in camp. The rations were then—

	Flour. Ch.	Dál. Ch.
For working adults of both sexes.	10	2
Non-working adults of both sexes.	8	1½
Children above 10 years -	6	1½
Ditto below ditto -	4	1
Ditto in arms - -	2	1

Those who were not very emaciated before coming into the poor-house improved slowly on this ration.

The number of paupers discharged was—

Men.	Women.	Children.	Total.
1,755	1,900	1,845	5,500

Dr. Hilson.—The ration suitable for an ordinary non-labouring inmate of a poor-house ought to consist of—

Atta made into chappatis -	8 chittacks,
Dál - - - - -	2 chittacks,

with condiments.

This has been found sufficient to maintain in health an adult in the Agra poor-house. Vegetables (6 chittacks) and oil ought to be substituted for the dál three times a week.

Those much reduced by innutrition ought to be sent to hospital if possible, and fed on the above diet with the addition of kichri (4 chittacks) mixed with *ghi.* They ought to have two meals at least every day, and if much reduced, it will be found advantageous to increase the number to four.

But in every case it should be ascertained whether the pauper be suffering from diarrhœa, because, if so, the above diet is unsuitable and ought not to be given.

The undersigned has had no experience of the ration which consists of 1 lb. of raw flour with condiments; but it may safely be said to be insufficient to maintain a pauper in health for a prolonged period, even when firewood is supplied with it.

In the jails of the North-Western Provinces 100 grains of salt are given to each adult prisoner, and this has been found quite sufficient when the diet consists chiefly of wheat or barley.

But if a rice diet be given this quantity must be largely increased.

In addition to the salt one chilli per diem should be given to each pauper, and the addition of a few spices to the dál renders it more digestible.

Dr. Fasken.—My experience is, that men can work and remain fairly well on the ration of one pound of flour with condiment. All prisoners sentenced to one month receive this diet. They leave the jail well enough, but have generally lost weight. Women in jail always have this amount of atta, and keep their health. Prisoners sentenced to more than a month and up to three months also get this diet, provided they are not employed on very hard work. As the result of my experience in jails for the past year, of the ration of 1 lb. of raw flour with condiments, my opinion is that such a ration is sufficient to support life. About half a tola of salt and one chilli would be a sufficient quantity of condiments.

Mr. Story.—The rations given in the poor-house at Orai are according to the Government scale.

Whilst employed at hard work.	Without labour.
Adult men or women, 10 chittacks flour.	8 chittacks.
Children not in arms under 12 years, 5 chittacks flour.	4 do.
Infants in arms, 2 chittacks	2 do.

Where the infant is unable to eat, and being suckled by the mother, this allowance is given to the mother. I think this a liberal allowance and the people rapidly improved on it. Persons much reduced by innutrition were treated medically in the hospital, where they received rice, arrowroot, sago, corn-flour, and such things as the doctor deems necessary.

It has been found in the poor-house that one pound of raw flour with condiments is quite sufficient to support life; in fact the people pick up with that allowance. Amount of condiments given is 1½ chittacks dál, about a pice weight salt, and once a week vegetables, 1½ chittacks adult, 1 chittack child.

Dr. Freyer.—The ration for adult non-labouring paupers should consist of—

Flour - - -	16 ozs.
Dál - - - - -	4 „
Salt - - -	150 grains.

When vegetables are procurable, they should be supplied two or three times a week, each pauper being allowed 8 ozs. It would be well also to allow each person one or two chillies every day. This diet I consider sufficient to sustain life in non-labouring paupers. But when labour is exacted from the inmates of a poor-house, it will be necessary to allow them at least 4 ozs. more of flour; and when the labour is hard, even 8 ozs. I think, however, that it is a mistake to have factories in a temporary poor-house, such as that which is required in connection with famine. When people are strong enough to work they should be drafted to various public works in the district. No persons, save those who are absolutely unable to work, should be allowed to remain in a poor-house.

For those who are very much reduced by innutrition it will be necessary to prescribe a diet of the following kind :—

Rice - - -	12 ozs.
Milk - - - -	2 lbs.

and this they should have in two meals, one in the morning and the other in the evening. From personal observation I have ascertained that when weak and infirm persons come into a poor-house in a very reduced state of health, and are then fed on the ordinary chapatis, being unable to digest this food, diarrhœa soon sets in, the food passing through the gut in an undigested condition, and in many cases death supervenes. Persons of this description are more fitted for the hospital than the ordinary wards of a poor-house, and I think it would be an excellent plan to keep them in a separate portion of the poor-house, and that the hospital assistant in charge should be directed to pay particular attention to them, and see that they do not suffer from the kind of diet allowed them.

Dr. Mulvany.—Attached is a proposed diet scale. This is a slight modification of that laid down in Sir John Strachey's minute on poor-houses, and also slightly differs from that employed in the Rae Bareli poor-house. Diet No. 1 is for males going through really hard bodily labour. This includes water-carriers, wood-cutters, buriers of the dead, kneaders of dough, &c. It has been found necessary to keep a limited number of strong men for these purposes, and less than 12 chittacks is not sufficient for them. Besides, this is the allowance for men doing not harder labour on the roads. The number getting this ration should, of course, be strictly limited to the requirements of the poor-house.

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PROPOSED DIET SCALE for PAUPERS.

Name of Article.	1. Adult males on hard labour.	2. Adult females labouring, suckling mothers, and temporarily enfeebled males, non-labouring.	3. Permanently disabled adults including old, blind, idiots, lepers, &c., of both sexes, and children from 10 to 15, labouring.	4. Children from 10 to 15, without labour, and children under 10, labouring.	5. Childrem from 1½ to 10 years, without labour.	6. Children under 1½ years (to be eaten by mothers if children be too small to eat).	7. Suckling children if mothers' milk be scanty.	REMARKS.
	Chittacks.	Chittacks.	Chittacks.	Chittacks.	Chittacks.	Chittacks.	Chittacks.	The flour should be of pure wheat only, as a rule. Flour made of coarser grains causes diarrhoea. Very little, if any, bran need be removed; it does no harm if ground finely. The flour to be cooked into cakes, the dry constituents of which weigh *two* chittacks each. Two chittacks dry become 3¼ to 3½ chittacks by mixing with water. The dough for each *cake* should be *weighed separately*, and should be about 3⅜ chittacks. This when cooked should weigh three chittacks. The hospital diet scale employed in the jails of the North-Western Provinces and Oudh ought to answer well for poor-house hospitals. Those "much reduced by innutrition" should be taken into hospital and get this diet.
Flour -	12	10	8	6	4	2	—	
Dál -	2	2	1½	1½	1	1	—	
Salt -	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{20}$	$\frac{1}{20}$	—	
Firewood	7	7	7	7	7	7	—	
Milk -	—	—	—	—	—	—	3	

No. 2 diet is for (1st) labouring females, to whom the same remarks apply as to labouring males; (2nd) suckling mothers, for whom a fairly generous diet is obviously necessary; (3rd) temporarily enfeebled adult males, non-labouring. Of these latter it is particularly necessary to speak. They come into the poor-house in a reduced state, yet not so bad as to require treatment in hospital. They are too weak to be sent on the relief works. The 1 lb. ration is not enough for these men, and they are slow in showing an improvement under it. They do, no doubt, gradually, as a rule, improve, but it would be more economical to give them 10 chittacks and get rid of them more quickly. They could then give some return by labouring on the roads, and besides make room for others in the poor-house.

No. 3 diet (*i.e.*, the 1 lb. ration with condiments) is sufficient for the class of people noted, viz., the permanently disabled. There is no chance of getting rid of such people until they choose to go themselves, and the 1 lb. ration is sufficient to secure their lives. This ration is also sufficient for children from 10 to 15, labouring. Boys of this age able to labour should seldom or ever be kept in a poor-house, so the diet will generally be applicable to young girls only. Rations Nos. 4, 5, 6, and 7 are those which have been in use in the Rae Bareli poor-house. They are sufficient, but not excessive. Children, as a rule, thrive well on these allowances. Sick children, of course, require special diet in hospital.

The quantity of dál and salt noted in diet scale A. is quite sufficient.

Seven chittacks of firewood all round for adults and children is an ample allowance. In fact, the entire of this quantity is never expended.

These should be treated in hospital, and the hospital diet scale in use in the jails of the North-Western Provinces should be allowed them.

I have had experience of the 1 lb. ration, both in the jail and poor-house, for the last ten months. The condiments noted under No. 3 diet in scale A. are sufficient.

(*a.*) *Experience in the Jail.*

Here the prisoners get 2 instead of 1½ chittack dál, but that is the only difference from the poor-house diet.

All male prisoners of one month's term and less have been on this diet since 1st November 1877. Also all female prisoners of whatever term. Of the latter it is sufficient to say that I have seen no bad effects from the diet. I have more particularly noted the effects on the male prisoners, and I shall speak of them. A special register of the weight and health on admission and discharge of these latter has been kept, and the result is shown in the following form:—

RETURN of PRISONERS of One Month's Term and under on 1 lb. Ration.

Period of Observation.	Total Number.		Health on						Numbers.		
			Admission.			Discharge.					
	Admitted.	Discharged.	Good.	Indifferent.	Bad.	Good.	Indifferent.	Bad.	Gained in weight.	Last weight.	No change in weight.
Nov. 1877 to June 1878 -	553	529	353	127	73	384	112	33	224	104	201

This return shows an improvement both in health and in weight. The prisoners on this diet get only very light labour. A large proportion were in bad or indifferent health on admission, and even many of those whose health was noted as good had somewhat suffered in health from privation. In ordinary years the improvement in health and weight would not, I think, be so marked; indeed, more probably the reverse would occur. It is obvious that a man who has been accustomed to ¾ lb. of flour outside will improve to a certain extent in the jail where he gets 1 lb., while with a man who gets 1½—2 lbs. outside the reverse will occur. On the whole, however, it may, at the least, safely be concluded, so far as experience up to the present shows, that prisoners on light labour may be kept on this ration for one month without injury to health, and that in some cases the health improves.

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(b.) Experience in Poor-houses.

In poor-houses two main objects must be kept in view: (1st), to support life and maintain such a degree of health that the pauper's constitution will not permanently suffer; (2nd), to support life and restore the pauper's strength so as to render him fit for labour on relief works. To secure the first object I think the 1 lb. ration is sufficient, but for reasons sufficiently indicated above it should be confined to the *permanently disabled* amongst full-grown people. Other adults will be either suckling mothers, labouring paupers, or paupers temporarily enfeebled, who require to be strengthened before being sent on the relief works. For none of these latter is the 1 lb. ration sufficient, according to my experience.

For old, infirm paupers (the permanently disabled) I think 1 lb. is sufficient to maintain them in their usual health. Many of these paupers died in the cold weather, but the ration was in no way to blame. Hundreds who survive are as well as they probably have been for years and show no signs of failing health. About twenty paupers belonged to the permanent poor-house before the famine, and used then to get 1¼ lb. None of these have suffered in health by the reduced diet.

Dr. Bonavia.—I am of opinion that the ordinary diet of inmates of a poor-house should not be less than that of non-labouring prisoners. It should be remembered that the latter, in addition, are better sheltered, well clothed, and have a blanket if they require it at night and their cots are raised from the ground; while starving paupers would, as a rule, be in rags, with no blanket, and lying on a "chatái" on the ground, which, in the rains, would necessarily be more or less damp. An individual emaciated from want of food requires food enough to—

(1.) Keep him alive.

(2.) To keep him warm.

(3.) To restore his organs to a comparatively healthy working state.

A large proportion of food goes to keep the *body warm* which can *never* be shown as *additional* weight. A man warmly clad and lying between blankets can do with much less food than a naked or imperfectly clad man.

The *best* diet for those who are much reduced by innutrition, and especially for those also suffering from diarrhœa or dysentery, is pounded *raw* meat. There is nothing to be compared with this. A much reduced man, or child, from starvation has no blood, and therefore no means of elaborating secretions for digesting *any ordinary food*. Raw meat makes blood at once with the *slightest* digestion. In a comparatively short time the individual so treated is enabled to digest coarser food. This is Weisse's treatment, endorsed by Trousseau and others. But as it is probably hopeless to get natives to submit to it, then small quantities of milk with ground rice boiled in it, with sugar and salt, every four hours, I think, would be the best diet, with stimulants and blankets. When the individual is found to digest this diet, ground *flour well sifted* should be substituted for the ground rice.

Dr. Planck.—The rations I would give to the ordinary inmates of a poor-house are for an adult male above 10 years of age, and for a woman with a suckling infant:—

No. 1 - 10 chittacks of wheat flour.
2 chittacks of dál.
¼ chittack of salt.
½ seer of firewood.

For an adult female above 10 years of age:—

No. 2 - 8 chittacks of wheat flour.
1½ chittack of dál.
¼ chittack of salt.
1 seer of firewood.

For children, male and female, under 10 years of age:—

No. 3 - 4 chittacks of wheat flour.
1 chittack of dál.
⅛ chittack of salt.
½ seer of firewood.

For those by whom, from prolonged innutrition, I believed the ordinary diet could not be digested, I would have a diet of boiled rice and ground dál as follows:—

No. 4 - 6 chittacks of dry rice.
2 chittacks of ground dál.
¼ chittack of salt.
1 chittack of ghi.
1 seer of firewood.

No. 5 - Half of No. 4.

The rice to be boiled, when it should weigh not less than 20 chittacks; the ground dál and salt to be made into gruel and poured over the rice; the diet to be divided into two meals; the ghi to be rubbed into the skin. If I thought it advisable, I would supplement this diet with a chittack of gur.

But, in truth, a man greatly emaciated from prolonged innutrition is in a diseased condition approaching to death, and even with the most careful treatment and dietetic management many such must die. It is the deaths of persons admitted in this condition which swell the mortality of a poor-house,—a mortality which has, as a rule, reached to between 10 and 12 per cent. of those admitted in the poor-houses where I have made inquiry. That is the result of many months' management; at first the deaths have occurred in greater ratio. But even with the best results of 10 per cent., the meaning of the ratio is that out of every 10,000 persons who passed through the work-house (many come and go daily) 1,000 have died there.

One poor-house I have carefully inspected, where the ordinary diet consisted of one pound of barley bread. The general condition of the inmates was deplorable, the mortality had been excessive, and several persons were seen there who would certainly die before many days had passed. In another, where the diet at the time of my inspection had been increased, I received ample testimony that the former diet of one pound of wheat and barley flour mixed had been found insufficient, an excessive mortality accompanying its continuance.

I do not think any person of common sense, certainly no person who has given thought to the subject, will accept the conclusion that a pound of raw flour with condiments, which I take to mean salt, is a sufficient diet for a man for 24 hours. I feel sure that the inmates of a poor-house so dieted cannot be kept there. They will come no doubt to receive their ration of bread, but will beg or search in the day-time for additional food. If forcibly detained in the poor-house night and day, the generally bad condition of the people on admission will not give way to a general improvement, and the mortality will be excessive. I have seen a poor-house where this pound a day system was in force, in which the part called the "*hospital*" approached in extent and population to the part called the "*poor-house*."

Mr. T. Stoker.—The poor-house was open from the 26th March to the 9th June 1874; during that time distributions of uncooked food were made daily to all applicants unable to labour on the relief works. The numbers were latterly about 100 per diem.

The rations were:—

Adults - 6 chittacks rice and 2 chittacks dál.
Juveniles - 3 " " 1 "

that is, 8 chittacks uncooked food to adults and 4 chittacks to juveniles. Each person received in addition a little salt, and on a few occasions a little turmeric was given to each.

The recipients were left to their own devices to cook their food as they liked best, and were at liberty to do what they pleased during the day. They belonged mostly to the class of professional beggars, and being one and

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all quite unfit for work, could not have added to this ration by labour. Mendicancy was certainly open to them, but under the circumstances, very few of them could have gained anything by resort to it. There was no one to beg from except a few baniyas, and in the presence of the organized State relief, these men refrained from any private charity, referring all applicants to the works or the poor-house.

As the same persons continued receiving gratuitous relief during the whole time the poor-house was open, I am able to affirm that they not only remained in good health, but visibly improved on the half seer ration.

On the 7th June cooked food was substituted for uncooked, but the amount of the ration remained the same. A ration of uncooked grain having been weighed, was separately cooked, and then weighed or rather measured again, and the other rations apportioned accordingly. On the 9th June, the relief works having been closed, the workhouse was opened, and the paupers were confined within its limits and set to some sorts of light work. During the remainder of the time I was in charge of the workhouse, till 13th July, the condition of the inmates remained, so far as I could judge, unimpaired.

The only complaints I heard were not against the quantity of the food, but against the monotony of the diet and the practice of allowing only one meal in the day.

It may be broadly put down that the whole of these inmates were non-workers, as the amount of labour they did was so trifling as not to be worth taking into calculation.

I do not think the half-seer ration would be sufficient for adults who had to perform any real labour I would place the proper allowance for them at 10 chittacks, which I would divide into an evening meal of 8 chittacks and a midday or morning meal of 2 chittacks of chabena or some parched grain.

But for persons who have no work to do, I think (and I am justified by experience in thinking) that a 1 lb. ration is sufficient to maintain them in health.

BENGAL.

BENGAL.

Mr. Kirkwood.—In Moradabad (1861) I see, the poor-house ration was—

Adults, 8 chittacks flour, 1½ chittacks dhall.
Children above 10, 6 chittacks flour, 1½ chittacks dhall.
Children below 10, 4 chittacks flour, 1 chittack dhall.
Children in arms, 2 chittacks flour, 1 chittack dhall.

That was the allowance for those who did no work. Adult inmates of the poor-house who did some work received two chittacks of flour and half a chittack of dhall more.

In the months of July, August, and September, in the Cuttack district, the allowance, at first I think eight chittacks of rice, was increased to 10 chittacks. From the 1st October 1866 to December 1867, when operations closed, the rice allowance was 13 chittacks, or 1⅝ lb. The allowance was increased up to this standard, because it was found that, though the lesser allowances might serve to maintain life, the people did not improve upon them. The effect of the larger allowance in causing a material improvement soon became apparent. It was deemed poor economy to keep these unhappy creatures on a diet so low as only to admit of their lingering on in the same condition. As the Famine Commissioners (1866) remarked, however, light meals must be given to a fresh arrival starved and emaciated. The enfeebled digestion cannot then dispose of a full meal, and death often resulted from recklessness in this matter, albeit a recklessness that had its source in a humane and deeply-moved sympathy.

Together with the allowance of 13 chittacks of rice to an adult (given in two meals) we gave ⅓ chittack of oil and ⅓ chittack of salt. The allowance for a child was 8 chittacks of rice, and similar condiments. Further, each adult was allowed 1¼ chittacks dall, and each child ¾ chittack. Whenever fish was obtainable it used to be given in substitution for dhall on two days in the week. Ghee was also originally given in small quantities, but was discontinued when we got more ahead of the distress. Ooriyas are much given to smoking cheroots (made in their own villages), and during the damp and chill of the rains of 1866, when the poor things were in a very starved, diseased, and despondent state, the adults eating in our relief-houses had two cheroots per diem served out to them. This was found of great service in warming them and reviving their spirits. In the majority of cases no portion of the daily allowance was so eagerly looked for as the cheroots. With rice-eating population salt is, I believe, of special importance in keeping the people in a healthy state of body. In the hospitals extra luxuries were given, such as the medical officers saw fit to direct.

I cannot call to mind the precise allowance given in Bhagulpore. It consisted of rice, dhall, salt, and (I think) oil. The rice allowance was not so large as in Cuttack, for the people were not so reduced, and matters were more in hand from the commencement. I think it was 10 chittacks per adult. There is no doubt that our allowance of 13 chittacks in Cuttack was somewhat excessive; but it was thought better to be on the side of excess than of deficiency, and a margin was deliberately allowed for peculations by subordinates which we were practically unable to prevent. It was thought much better that these peculations should come out of the excess thus allowed than that they should reduce a subsistence allowance to something which was not even bare subsistence.

In Bhagulpore I was the subject of much good-natured ridicule because I supplied the famine hospitals each with a few tins of Liebig's extract, and two or three bottles of wines and spirits. But these were, as I knew would be the case, found very serviceable, and being taken as medicine, were not objected to. A little warm soup used to be a great thing for a fresh arrival, and kids were not always procurable.

At Ajmere (1869) the allowance to adults appears to have been 1¼ lb. of mixed rice and dall, or bajra and dall, or bread and dall; ¾ lb. appears to have been the allowance for every child above five years of age, and ¼ lb. to children below that.

In Cuddapah (March 1877) the food given was cholum and raggi mixed. Two meals were given daily, at 10 a.m. and 5 p.m., each meal consisting of ¾ lb. of the above grain for an adult male; women and children received less. Condiments were given besides No betel-nut being given was one reason why the paupers disliked being detained in the camp.

At Dhurumpooree, in Salem (April 1877), many of the 1,000 occupants of the relief camp were in no way thriving. The ration of rice was consequently raised from 1 lb. to 1¼ lb. for adults.

Summing up, then, I would say, for the non-working occupants of a poor-house, the daily allowance should be as follows:—

Adults - -	1¼ lb. of rice or equally nutritious food. 2½ ounces of dhall. Where fish is procurable, it should once or twice a week be given in lieu of dhall. Fresh vegetable curry should every now and then be given in lieu of the dhall. ⅔ ounce of salt. ⅔ „ of oil.

H. III. Qn. 26.

BENGAL.

Children between 15 and 10 years of age.	1 lb. of rice. 2 ounces of dhall. ⅔ ounce of salt. ⅔ ,, of oil.
Children between 10 and 5 years of age.	¾ lb. of rice. 1½ ounces of dhall. ½ ounce of salt. ½ ,, of oil.
Children below 5 years, but no longer suckling infants.	⅜ lb. of rice. 1 ounce of dhall. ⅛ ,, of salt.

The above is the weight of the food when cleaned and uncooked. Inmates of the poor-house who do some appreciable amount of work should receive quarter of an anna in cash besides; or, which would be still better, should be remunerated by piece-work for the work they do, whether it be spinning, or weaving, or rice-husking, &c. The rates for such piece-work should be fixed so as to yield on the average quarter of an anna a day; slightly more to those who really exert themselves, and slightly less to those who are given to be lazy. This money should be in addition to the daily food, and the recipients should be allowed to expend it as they may desire.

If the food ration is distributed cooked, it should be given in two meals, one about 10 a.m. and the other about 5 p.m. If (as I strongly recommend when such evils as poor-houses are necessary, and the recipients are not at the time actually starving) it is given uncooked, a weekly or fortnightly distribution would, I believe, suffice; at any rate, it need not then be more frequent than once a day. In the case of uncooked food, a small supply of fuel would have to be issued with the food ration.

I do not think the 1 lb. ration sufficient to revive people who have sunk into a low condition, though it may just suffice to keep body and soul together when no work is required.

The oil might, perhaps, if medical opinion is not opposed, be omitted or reduced to two or three times a week. In hospitals or in the case of people much reduced, milk, soup, and such like nourishment should be given. Rice water and sago have also been found of service in such cases.

BOMBAY.

BOMBAY.

Mr. Hewlett.—The question of what food is best to be given must depend on circumstances. During a great part of the famine, milk, which is undoubtedly the best food for infants, children, and persons so reduced as to be unable to retain solid food, was not procurable over a large portion of the Southern Maratha country. *The milch cattle had died*, or had been driven away to find pasture. Goats' and asses' milk was not procurable, for want of fodder to feed them.

The following ration was given at Belgaum to persons attending the poor-house, which they did once a day—each man received three *bhakarees* made of jowari flour, each woman received two *bhakarees* made of jowari flour, each child over ten years received one and a half *bhakarees*, each child under 10 years received one.

The weight of each *bhakaree* was six ounces, so that—

	lb.	oz.
A man received -	1	2
A woman received -	0	12
Children over 10 received -	0	9½
Do. under 10 received -	0	6

In addition, a ladle (about nine ounces) of mussoor dhall soup was served with the bread.

For the children about a pint of gruel was added, and after they were served, what remained was divided among the adults. Onions also were given.

Milk was served to sick children. To every twelve seers of the mussoor dhall after boiling, two seers of currystuff and one and a half seers of salt were added.

The above ration afforded, it was stated, an ample meal; and certainly, when I saw the people (upwards of one thousand) fed, they appeared to me to be thriving on it. This ration, under the energetic supervision of Mr. Shaw, the Zillah judge, saved the lives of large numbers. Mr. Shaw's report* on the management of this poor-house will well repay perusal.

At Bijapur Dr. Wall, Deputy Sanitary Commissioner, drew up a scale for children and mothers, which was adopted when possible in the Kaladgi zillah, and which answered well.

It was as follows:—

Children.

Morning Meal.

Porridge - - grain, 6 oz.; milk, 4 ,,; sugar, 4 drs.

Evening Meal.

1 bread - - - 6 ozs. grain.
½ pint dhall soup.

Mothers.

Morning Meal.

1 bread - - 6 ozs. grain.
½ pint dhall soup.

Evening Meal.

2 breads - - 12 ozs.
Porridge - - 6 ,,
½ pint dhall soup.

This was for suckling mothers, with children at the breast.

The various local committees generally adopted Mr. Shaw's scale for all outdoor patients. I think 16 ozs. of jowari or bajri (not rice) flour, 3 ozs. of dhall for soup, 3 ozs. vegetables, 6 drs. of salt, 4 drs. of condiments, 2† ozs. of sweet oil, would be an ample ration for the inmates of a poor-house. This diet would, with the exception of 4† ounces of sweet oil, allowed instead of two ounces, be identical with what in all jails in Western India has for the last seven years been the diet for prisoners sentenced to hard labour *for three months and under*, and it has thus been found sufficient; and this diet, I think, might be given to working paupers, Mr. Shaw's diet scale being adopted for non-workers.

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* A copy provided.

† Qy. drachms.

MADRAS.

Mr. Grose.—I am disposed to think the ration finally fixed by Government sufficient for paupers leading a completely idle life in a relief-camp. It seemed to me enough to support life, and even to produce a gradual improvement. The larger ration which was given for some time caused sickness, and the smaller ration was obviously insufficient. The ration finally fixed was as follows :—

20 oz. raw rice.
2 „ dholl.
1 „ salt.
½ „ tamarind.
¼ oz. ghee or oil.
$\frac{7}{16}$ „ curry-powder.
½ „ onions.
¼ „ garlic.

I think that the garlic might be omitted, that ¼ oz. oil would be enough, and that it would be better to give a little dry fish (or sometimes meat) and a few vegetables than dholl, which is less liked and less digestive. It is essential that there should be precisely the same rations and the same sort of cooking at all camps, or some will be more attractive than others.

As regards the special ration to be given to patients in hospital, Government prescribed a 24-ounce rice ration with meat; but I think the amount by which it exceeds the ordinary ration was seldom eaten, except by the hospital attendants. Milk, arrowroot, &c., and even meat should be given, but only in special cases and under the orders of a medical man. I have no experience of a 1-pound ration, but I am sure it would be insufficient.

Mr. Crole.—As regards ration, I have found the following sufficient for ordinary adult paupers :—

1 lb. raw grain.
¾ oz. dholl or 4 oz. vegetables or 2 oz. salt-fish.
½ „ salt.
½ „ tamarind.
½ „ chillies.
A leaf or two of tobacco.
„ „ betel.
½ an areca nut.

When dholl is given, it must be triturated and then boiled slowly in water with the chillies, salt, and tamarind; thus forming a "char" or curry. If not given so, it causes diarrhœa.

With reference to this matter please refer to answer to Question 6, Section I. of Chapter III. It must be remembered that in a relief camp the cleanliness, regularity, and freedom from exposure or exhausting labor add to the recuperative qualities of diet.

The ration now in force under G.O., No. 2,372, dated 24th July 1877, is as follows; and I think it unnecessarily high except for special diet paupers :—

Ordinary.

		Per diem. oz.	dr.
(1) For adults and children of twelve years and upwards.	Raw grain -	20	0
	Dholl -	2	0
	Salt -	0	12
	Tamarind -	0	8
	Chillies -	0	8
(2) For children under twelve years.	Half the above rations.		

Special.

		Per diem. oz.	dr.
(1) For adults and children of twelve years and upwards.	Raw grain -	24	0
	Vegetables -	4	0
	Dholl -	2	0
	Meat or fish (thrice a week) -	3	0
	Salt -	1	0
	Tamarind -	0	8
	Ghee or oil -	0	8
	Curry-powder -	0	7
	Onions -	0	8
	Garlic -	0	4
(2) For children under twelve years.	Half the above rations.		

Between May and July 1877, there was the undermentioned much higher scale, under G.O., No. 1,648, dated 5th May 1877.

Ordinary.

		Per diem. lb.	oz.	dr.
To all classes in camps - -	Rice - - - -	1	8	0
	Vegetables - - -	0	4	0
	Dholl - - - -	0	2	0
	Mutton, excluding bone, or equivalent in fish three times per week -	0	3	0
	Salt - - - -	0	1	0
	Tamarind - - -	0	0	8
	Ghee or oil - - -	0	0	8
	Curry-powder - -	0	0	7
	Onions - - - -	0	0	8
	Garlic - - - -	0	0	4

Children under twelve years were given half of the above rations.

Note.—I find this to be the same as that of special diet under G.O. of 24th July.

In my opinion these quantities were much too large and overtasked the digestive powers of persons reduced by long-continued privation. I have not observed that these larger rations caused the same improvement as the diet first mentioned, and which I introduced and worked for some time before Government laid down any rules on this subject.

Dr. Gray.—Since the great controversy between Sir R. Temple and Dr. Cornish, I have regarded the 1 lb. ration and half an anna as ruinous to health; but since I came into this district I have been at pains to ascertain what a laborer usually eats *per diem*, and I find that, in the majority of instances, a man very seldom gets more than half a seer, or 1 lb. of grain to eat. I have over and over again questioned people as to their daily wages and the number of people they have to feed at home, and I found that invariably the man cannot afford to eat more than 1 lb. grain a day.

To prove that 1 lb. of grain with half an anna was either insufficient or sufficient I, on the 26th August, got together four madigas—*i.e.*, four men of the chuckler caste—and placed them on the Temple ration. On the 26th, 27th, and 28th they did no work. On the 29th they carried big stones from a hill two furlongs away and placed them round my hut. This was a good day's work. On the 30th and 31st August and 1st September I made them dig a trench round my shed. I superintended their work and can certify that they worked as hard as any cooly employed by the Department of Public Works. The annexed table will show their weights on the days mentioned, also their ages and heights :—

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MADRAS.

Results of placing men on the 1 lb. rations and half an anna.

Name.	Age.	Height.		Weight.									Remarks.
				26th Aug.	27th Aug.	28th Aug.	29th Aug.	30th Aug.	31st Aug.	1st Sept.	2nd Sept.	9th Sept.	
	yrs.	ft.	in.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	I weighed them again a week after, on the 9th September, and found that they gained a few pounds. This diet will support life and keep a man in fair condition, but not in a splendid condition of health.
Mathigadu	30	5	5	110½	107½	108	109	108	106½	106½	106½	108¼	
Kumbadu	35	5	8	107	104	103	103¾	104	103	104¼	104	107	
Obigadu	19	5	2	92¾	91	91	91	92	91	92½	...	92	
Loduganadu	17	5	0	78	75½	76	76½	77½	76	76¼	77	79	

From these investigations I am of opinion that 1 lb. of grain and half an anna is quite sufficient to keep a person in fair condition of health. These men received 1 lb. of rice each with half an anna; out of the money they purchased three pies worth of dried fish (small) and three pies curry-stuff; these weighed respectively 1½ oz. and 3¼ oz.

I can certify to the fact that they ate nothing else. My shed was nearly a mile from the village and one-third of a mile from the relief-camp, so that it was difficult for these men to leave us unobserved. I had a peon watching over them day and night. Whenever I awoke at night I would see if they were present sleeping in my verandah. Besides this supervision they were promised rewards if they strictly abided by my instructions. After the eight days were over they told me that if they were always sure of 1 lb. (half seer) of rice and half an anna they would be quite content.

Dr. McNally.—The following observations occur in my first report on the Cuddapah relief-camp (poor-house) on 29th April 1877:—

"The universal complaint was 'give us meat or let us go away.' The present ration (cholum or ragi 1¼ lb., dhall 1¼ oz., with vegetables and condiments) may perhaps be sufficient to support existence in an individual not previously reduced by starvation to the lowest ebb, but it is, without the slightest doubt, inadequate for bringing starved people back to working condition. The proof of this is the miserable state of the people who have remained in the camp since it was first opened. Every one knows that a horse in bad condition cannot be *restored* to working order without a much more liberal allowance than shall be required merely to *keep* him in good condition."

For people already much reduced by famine an easily-digested diet containing a fair proportion of albuminate, either in the form of meat, milk, or leguminous grain, and oil is necessary. The scale of poor-house diet introduced in May 1877 on the recommendation of Surgeons-General Gordon and Smith, was sufficient to restore the condition of people who had not been reduced too far and who had recovered from famine-diarrhœa.

In consequence apparently of the rapid improvement of people on this scale of diet, and the tendency of paupers to refer it to an insufficient scale of village-relief, an order (Madras G.O., No. 2,372, of 24th July 1877) was passed restricting it "to persons receiving special treatment under medical care," and directing for the other inmates of relief-camps (poor-houses) "a diet not exceeding 20 oz. of raw grain and 2 oz. of dhall." G.O., No. 2,473, of 8th August, added to this the necessary condiments.

This double scale of diet had only just been introduced when I was obliged to leave, but what I did observe of it led me to the belief that its introduction in the manner directed was not judicious. A second (lower) scale of poor-house diet would be proper *only* for such inmates as had regained fair condition but could not be drafted to relief-works. This class would comprise children too young to work, gosha women, cripples, and lunatics. *All others* should be retained on the superior scale as long as they are kept in a poor-house, that is, until they have been restored to working condition; then they should be sent to earn their living at relief-works or elsewhere.

During the height of famine there are frequent admissions to poor-houses of persons in an almost moribund state. These can only be rescued by medical treatment and special diet in hospital. This should be left to the discretion of the medical officer.

I have no certain experience of the effects of the ration for adults, which consists of 1 lb. of raw flour with condiments, beyond what may be gathered from inspections of the physical condition of individuals who had previously been subject to it. Regular reports of these were forwarded to the Sanitary Commissioner, and, as far as they went, they were decidedly unfavorable. Single inspections of this kind, however, cannot be regarded as conclusive, but may be taken to corroborate the more direct evidence of officers who, being stationary, had opportunities of watching the effect of the different rations upon the same individuals.

The query does not specify any particular kind of flour, but it should not be ignored that wheat and most other food-grains have a much higher nutritive value than rice.

In relation to this question it may be noticed that the relief wage was calculated on the price of rice, whereas in most places ragi and cholum, which are the ordinary food of the people, were considerably cheaper than rice. The period of greatest distress was at the time when the stocks of cholum and ragi had been eaten up and imported rice was the only grain obtainable.

Major Baynes.—We do not use flour in Southern India; but on a ration of 1 lb. of raw rice, adults in good condition deteriorate sooner or later, and if its issue had been maintained in the poor-house, the mortality would have been greater than it was; it did not seem to even temporarily allay craving for food in the case of adults recovering from the effects of previous privation.

N.B.—A ration is taken to represent the daily maximum of food and divided into two issues.

Of course it will sustain life for a short time, that is to say, a middle-aged healthy adult who gets it will live longer than one who gets nothing; but I have never seen a healthy one in prime of life maintain his condition on it, nor have I ever seen an emaciated one recover on it; in my experience the effect of 1 lb. of rice in such cases is simply to postpone death by starvation.

MYSORE.

Mr. Ricketts.—On the Mysore scale of food and condiments people have been known to improve in condition, and in fact thrive; but I think this is the exception rather than the rule. The ration referred to has been sufficient to support life; but in order to induce recovery and promote physical strength more change in the condiment part of the diet is necessary, especially as regards ghee, oil, sugar, and even meat occasionally. A much emaciated man, woman, and two children, on my own premises are now fully restored to their pristine health and vigor, and this is mainly, I think, owing to their getting scraps of meat, bread, and milk, besides rice and condiments. The woman thus fed was delivered two months after receiving her of a fairly healthy child, now well and thriving, and thus it may be that a generous diet saved the mother's life as well as that of the child.

NOTE on the quantity of FOOD required for the support of LABOURERS employed on PUBLIC WORKS in time of Famine.

The principal data for guiding the decision of the Famine Commission on this subject are—

1. The dietary which has been sufficient for prisoners in jail:
2. The reports of the Sanitary Commissioners in the provinces recently afflicted with famine:
3. The statistics showing the ordinary consumption of the labouring population.

First, as to Jail Dietaries. The Report of the "Indian Jail Conference" appointed under the orders of the Governor-General in Council to consider this, among other questions relating to jail administration, was sent up in May 1877. The following are the resolutions arrived at on the question of the prison diet:—

RESOLUTION I.—That labouring prisoners sentenced for terms not exceeding three months should receive less than labouring prisoners sentenced for longer terms. Opinions were too conflicting to admit of our coming to any resolution as to the amount of reduction.

RESOLUTION II.—That the following scale be laid down as a maximum for adult male prisoners sentenced to hard labour—

1. Grain, 28 oz. (including 4 oz. pulse) in the form of sifted flour, or 26 oz. in the case of wheat, rice, or barley.
2. Green vegetables, 6 oz.
3. Fatty matter, ¼ oz.
4. Salt, ½ oz.
5. Condiments, ¼ oz. pepper.
6. Firewood, 1 lb.

A reference to the table in the Appendix (p. lxxiii.) shows that the diet scale existing at this time varied for labouring prisoners from 24 to 29·3 oz. of cereals and pulses in different provinces. The lowest rate was one of 24 oz. of rice alone in Burmah; the highest was one of 22·8 oz. of millets and 6·5 of pulses in the North-Western Provinces.

In 1879 the following diet scale was fixed for the North-Western Provinces and Oudh for adult labouring prisoners:—

Articles.	SCALE I. Males sentenced to more than 3 Months.	SCALE II. Males sentenced from 1 to 3 Months, and all Adult Females sentenced to more than 3 Months.	SCALE III. Males sentenced to 1 Month and under, Females sentenced to 3 Months and under.
Flour of mixed cereals mostly of the coarser millets.	$22\frac{6}{7}$ oz.	$22\frac{6}{7}$ oz.	$18\frac{6}{7}$ oz.
Pulse - - -	$6\frac{4}{7}$ oz.	$1\frac{1}{7}$ oz.	$1\frac{1}{7}$ oz.
Vegetables - -	$5\frac{1}{7}$ oz.	$5\frac{1}{7}$ oz.	$5\frac{1}{7}$ oz.
Oil - - -	$\frac{2}{25}$ oz.	$\frac{2}{25}$ oz.	$\frac{2}{25}$ oz.
Salt - - -	100 grains	100 grains	100 grains
Pepper - - -	1 chili	1 chili	1 chili
Firewood - -	12 oz.	12 oz.	12 oz.

The evidence of the jail superintendents (medical men) shows that prisoners doing light work thrive on Scale III., and Dr. Walker, Inspector General of Jails, after a careful discussion of the chemical constituents of food, writes: "My conclusion is, therefore, that if "even a moderate day's labour is exacted, the wage "test should be fixed so as to enable a full-grown "man to purchase a daily diet containing not less "nutrition than—

"Wheat flour, 20 oz.
"Pulse, 4 oz.

"The value of the above articles of diet may be "stated at—

"Nitrogen, 255 grains.
"Carbon, 4082 „

"And I am of opinion that men will be able to do "a moderate day's labour on this diet, with the usual "allowance of condiments and firewood." He further goes on to say that if coarse flour (barley or millets) be given instead of wheat flour, 20 oz. of it will still be sufficient, "because natives will be able to supplement the allowance with articles of food pressed "into service under difficulties, although not ordinarily regarded as food; and because I believe that "in most cases labour on the relief works is very "moderate indeed."

In Bombay the jail diet for prisoners sentenced to 3 months' imprisonment and under is—

Flour of millets and wheat mixed, 19 oz.
Pulse, 3 oz.

with 6 oz. of vegetables daily, and other condiments.

Dr. Hewlett, the Sanitary Commissioner for Bombay, writes: "The standard diet scales for prisoners in jails "are very good guides as to the quantities of food to "be given to labourers."

Secondly, our next set of data consists of the opinions recorded by the different Sanitary Commissioners and high medical officers who acquired experience on this subject in the recent famine.

Dr. Cornish, the Sanitary Commissioner of Madras, writes as follows: "In regard to calculations regarding "average grain consumption, it may be assumed that "two-thirds of the people require a full average "ration, and of the remaining third, half will require "a half ration, and the other half a quarter. These "are rough calculations, but founded on the relative "ages; the number above and below 10 years of age, "and of the latter, taking a separate account of those "from 0 to 5. Assuming, therefore, that 24 oz. of "cereal grain represent the average consumption of "an adult, the following quantities will be required "for the daily sustenance of a population of 100 "persons:—

		Lbs. of grain.
66 adults (above 10 years)	-	99
17 children (from 5 to 10 years)	-	12·75
17 „ (from 0 to 5 years)	-	6·37
Total	- -	118·2

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Mysore.

“It would be safe to allow a margin on this calculation, and to reckon that each 100 of the population require from 120 to 125 lbs. of grain per diem, say 1½ lbs. per head all round. The ration for a working adult, doing a fair day's work, which I recommend, is (*a*) the value of 1½ lbs. of grain, *i.e.*, the grain usually consumed by him, either rice, cholan, &c., (*b*) money to provide about 1 oz. of fat, 2 ozs. of pulse, and the usual condiments, chilies, coriander, turmeric, &c.”

Dr. Henderson, Civil Surgeon of Bangalore, states in his evidence that, “for those who are to work harder” (*i.e.* harder than people in relief camps) “the lowest labour scale would answer, or its equivalent in money;” that scale providing, for prisoners sentenced for six months and under, a daily ration of 24 oz. of rice and millets and 3 oz. of pulse.

Dr. J. B. Lyon, Chemical Analyst, who has bestowed especial attention on the questions of the values of different grains in nitrogen and carbon, and the relation of the requisite food to the weight of the individual and the labour performed, considers that a “fair wage for men averaging in weight 105 lbs., on relief works under Public Works superintendence would be the value of 1½ lbs. of grain, plus three pie for contingencies, for seven days in the week, supposing him to do the Bombay task. A woman should get $\frac{9}{10}$ths of a man's wage. A boy or girl of from 7 to 12 should get half as much as an adult.” For light labour the value of 1¼ lbs. a day, plus three pie, would be a sufficient wage for an adult male.

In the North-Western Provinces and Oudh, in the famine of 1877-78, the Government fixed the ration of an adult labourer at 20 oz. of wheat flour and 4 oz. of fat; and Dr. C. Planck, the Sanitary Commissioner of the province, states in his reply to the inquiries of the Famine Commission that he thinks that ration was sufficient.

The third class of data are those which are afforded by the agricultural statistics. In each province an effort has been made to estimate the annual ordinary out-turn of food grain on the one hand, and on the other, the annual requirements of the province, among which the most important is the ordinary consumption of food by the population. The officers charged with the task of preparing these figures have, in each case, taken great pains to ascertain the figure which may fairly be taken to represent the normal quantity of food that each individual on an average consumes; and they have consulted the best and most experienced authorities, Native and English, and their estimates are in consequence of great value in determining the question. This is especially the case when it is seen that there is considerable convergence between those made by several independent authorities in different parts of India. They are as follows:—

	Annual Average Consumption of Food per Head in lbs.
Estimate for the Punjab -	456
North-Western Provinces and Oudh	460
Bengal - - - -	480
Central Provinces - - -	411
Berar - - - -	400
Madras - - - -	460

In the four large provinces the estimate is about 460 lbs. per head, and in two smaller provinces it is less. Now 460 lbs. is almost equivalent to 1¼ lbs. a day, and this represents the somewhat luxurious living of ordinary years, from which a slight deduction can safely be made to show the restricted consumption of a time of famine. It seems, therefore, reasonable to deduce from these figures that a sufficient ration would be composed as follows:—

1 adult male - - -	1½ lbs.
1 adult female - - -	1¼ lbs.
1 child (a half ration) - -	¾ lb.

Total for three persons 3½ lbs. daily. As adult males and females are nearly equal in number, and are together about 66 per cent. of the population, the above ration would amount to 1$\frac{1}{6}$ lbs. a day, or 426 lbs. a year per head of the population; which is only slightly below the estimated consumption for the population in ordinary years when too high prices do not act as a restraint on their diet.

To sum up. The Jail Conference decided that for an adult male, doing such work as an ordinary relief labourer would do, a ration of 1¾ lbs. per day is too much; but they could not decide how much too much. In the North-Western Provinces and Oudh a ration of 1½ lbs. is in force for such cases, and has been found sufficient. The opinions of the two Sanitary Commissioners most experienced in such matters, and of the Chemical Analyst of Bombay, agree that 24 oz. of food is a sufficient ration; and the compilers of the agricultural statistics of the different provinces agree that 1¼ lbs. a day is as much as, or more than, the ordinary average consumption of individuals of all ages and sexes; from which it can be deduced that the ration of 1½ lbs. for a man, 1¼ for a woman, and ¾ for a child corresponds closely to what may be estimated as the slightly restricted consumption of a time of scarcity.

C. A. E.

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QUESTION 27.—ORGANIZATION OF A POOR-HOUSE.

Give as fully as possible your views as to the organization of a poor-house. State how the food should be purchased and stored, what stock-register of it should be kept, and by whom, how given out to be ground, what the grinding task should be, how it should be received back and tested when ground, how given out to the cooking department; how information is to be given to the storekeeper or the head of the cooking department as to the number of rations required for adults and children, for ordinary, special, or sick paupers; in what way and in what vessels the food should be cooked, with how much water and fuel, what the weight of the cooked ration should be, whose duty it should be to test it, how it should be served out to the people, what discipline should be enforced among them while it is being served out and eaten? What precautions should be taken to see that it is eaten when received and not sold or exchanged, and that the children's portions are not taken from them by their parents or other adults? Under what circumstances should warm clothing be given, of what description, and at what probable cost per head? State what the rules of the poor-house should be as to the hours of rising, ablution, calling the roll-call, distributing food, going to and returning from work, and going to sleep? What arrangements should be made for personal ablution and washing clothes? What supervision is necessary to separate and take in time to hospital those who begin to sicken, or to distribute medicine to such as require it *but are not sick enough for hospital? State what work the paupers can be set to, what is most suitable for what cases, and how labour is to be enforced. What establishment is required (per hundred paupers) for cooking, grinding, sweeping the enclosures, cleaning the latrines, maintaining discipline, fetching water or wood or grass for thatching, removing the sick to hospital, or carrying out and burying the dead? To what extent may such duties be performed by the stronger of the paupers, and in case suitable persons cannot conveniently be obtained from among them, how should the necessary establishment be paid? What amount of general supervision is necessary? What registers should be kept up as to cash outgoings, stores in stock and issued, daily number fed, and daily expenditure of food, sickness, and death?*

Replies not summarised.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. A. Colvin.—The general arrangement of the Bijnor poor-house in 1877–78 is given below, but I must remark that though the arrangements were found to be well suited to this district, it is quite possible that they might be found unsuitable to the circumstances of others. For instance, thatching grass and bamboos are very plentiful and cheap here; in other districts it might be found impossible, or at any rate too expensive, to collect sufficient materials.

I.—General place and position of poor-house.—The poor-house was for most of the time in a large grove outside the town of Bijnor. For a short period it was in an open space, and this is no doubt the best position for it in mild weather. When the weather is either extremely hot or extremely cold the position is too exposed. It was considered preferable to have one central poor-house for the whole district, rather than a number of small poor-houses at out-stations, on account of the facilities for more complete European supervision. The best shape for the poor-house was found to be a rectangular one; this form of poor-house could be added to indefinitely. The poor-house was divided into barracks, each containing 16 huts, and each hut containing from 16 to 25 paupers according to the season of the year.

The huts consisted simply of two thatches set up in the form of an inverted "V." They cost Rs. 3-5-4 each. The whole poor-house was surrounded by a trellis of light bamboos bound together with string. The height varied from 3 feet to 8 feet according as the place fenced required more or less strict guarding. The latrines consisted of two enclosures fenced in by chatai matting, one being for men and one for women. Two sweepers were attached to each, and the filth was buried in trenches, which when nearly full were filled up with dry earth.

II.—Establishment.—The poor-house was under the general supervision of the Collector's assistants.

To aid in the work and to superintend the feeding of the paupers a committee of native gentlemen and other respectable persons was formed.

The paid officials of the poor-house were as follows:—

(1.) A munsarim on Rs. 50 per month, who resided on the spot.

(2.) Two (or when the number of paupers was small, one) muharrirs on Rs. 7 each. One of them was in charge of the stores kept at the poor-house, and of the accounts and returns connected with labour; and the other's duty was to prepare all returns and accounts not connected with labour.

(3.) A chaprasi on Rs. 3 per month, in addition to his food (the same quantity as was given to paupers), was appointed to the charge of each barrack.

One chaprasi was appointed to enter the names of fresh admissions in the general register.

One chaprasi was attached to the separate enclosure for lepers, and one to the hospital.

(4.) The establishment of chaukidars was liable to variation with the numbers in the poor-house.

(5.) For Hindus a cook and a kahâr were employed.

(6.) Bhistis and sweepers were appointed according to the numbers in the poor-house.

(7.) For assistance in guarding the place seven constables and one head-constable were supplied by the District Superintendent, Police.

III.—Rules for admissions.—Paupers were either those sent in from out-stations or those who came of their own accord for admission.

The regular time for admissions being early in the morning, those who arrived from out-stations later in the day were put into a separate enclosure and then fed and left for inspection by the Assistant Magistrate next morning.

Those who were found to be ill or very weak were sent to the hospital.

All admissions were made by the Assistant Magistrate assisted by a member of the committee. The applicants for admission were sorted by him into two enclosures, one for those who were considered in a fit condition for admission, the other for those who were to be drafted on to the roads. The chaprasi entered the names of all new admissions in a register kept in the subjoined form:—

Date of admission.	Serial number.	Name.	Caste.	Residence.	Class, *i.e.*, whether adult or child, and if child, whether over or under 10 years or in arms.	Remarks.

To each pauper was given a wooden ticket with his serial number on it. When all the new admissions had been entered in the register, received their tickets, and been fed in the admission enclosure, they were distributed amongst the different barracks of the poor-house. New admissions on being drafted into a barrack were assigned to a hut or huts; a separate register of the names and classes of the inmate of each hut was kept by the chaprasi. The names of new admissions were entered in the register of the hut to which they were assigned. Those applicants who were set aside to be drafted on to the roads received their food for the day, and were then sent off under a guard to the works which they were able to reach next morning.

All dismissals from the poor-house were also made by the Assistant Magistrate or, occasionally, by the Civil Surgeon.

The Assistant Magistrate (if possible) examined the inmates of about one-seventh of the poor-house each day so as to bring the whole place under inspection once a week.

No hard and fast rules could be laid down for admissions and dismissals, but the following principles were generally observed in the case of able-bodied adults accompanied by children unable to work.

(1.) An able-bodied adult with one child, of whatever age in good condition, was supposed to be able to support himself or herself and the child on the works.

(2.) When he or she was accompanied by more than one child it was considered that for the family to be self-supporting there must be at least one child over 10 to each child under 10.

These rules even, however, were liable to variation according to the severity of the distress. The lepers

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were kept in a separate enclosure at some distance from the poor-house.

IV.—Food.—The food for Muhammadans and those who were indifferent as to the caste of the cook, was cooked by contract at the rate of Rs. 0. 4. 6. per maund of flour cooked. This included the cooking of the dál proportionate to the amount of flour, firewood, the use of iron vessels for cooking dál, and in fact everything except the cost of carriage of water, the construction of cook-houses, and that of the ovens in which the bread was baked.

The bread was baked in cakes containing each two chittacks of flour.

The flour was at first one-third gram and two-thirds wheat, but when gram became dearer than wheat the latter alone was used.

It was found by experiment that one maund of wheat flour produced 1½ maunds bread. When one-third gram flour was used, only one maund, 17½ seers of bread was produced.

The flour was brought ready ground in the Bijnor market from contractors at the regular market rate.

This was found cheaper than grinding grain in the poor-house, where it would have been very difficult to prevent heavy loss by theft and wastage. The flour was weighed in presence of the munsarim and made over to the cooking contractor, who was bound to produce the weight of bread corresponding to the amount of flour on the calculation above given. The different kinds of dál used were (1) gram, (2) urd, (3) masúr, (4) moth.

Chillies were cooked in the dál at the rate of ¼ seer per maund of dál. When vegetables were procurable they were given twice a week or (if possible) every other day in place of dál, but in double quantity.

The ordinary diet allowed was as follows:—

Class I.—Adults of either sex 8 chittacks flour (4 cakes) and 2 chittacks dál.

Class II.—Children between 10 and 15 years 6 chittacks flour (3 cakes) and 1½ chittacks dál.

Class III.—Children between 3 and 10 years 4 chittacks flour (2 cakes) and 1 chittack of dál.

Class IV.—Children at the breast one cake and ¾ chittack extra dál given to the mother.

Each class had a zinc ticket corresponding to it of a different shape for each class. Every morning the names of the paupers were called over in each barrack according to the chaprasi's list. This was done in the presence of a member of the committee appointed to distribute food tickets. To those who answered their names a zinc ticket corresponding to their class was given. The names of those who failed to answer were struck off, and they had to go through the processes of re-admission before they could obtain a meal.

When the zinc tickets had been distributed by the members of the committee told off for that duty, the food was taken round by other members, who gave to each person the amount of food represented by his zinc ticket, which he took from him and again returned to the ticket distributing members for re-distribution next day. The bread before distribution to the barracks was weighed in presence of a member, a maund at a time. The number of cakes was also counted: one maund of bread should contain 226 cakes.

Those who required, on account of extreme emaciation, an extra or special diet were kept in a separate barrack. They were selected by the Civil Surgeon.

The chaprasi in charge of this barrack always kept a supply of milk and *khichri* for persons arriving in a specially exhausted condition.

V.—Hospital.—A separate enclosure was made for the hospital at a distance of 200 or 300 yards from the poor-house.

It was under the charge of the Civil Surgeon, who visited it daily.

A compounder resided on the spot. The shelter provided was similar to that in the poor-house.

The diet for the patients was prescribed by the Civil Surgeon.

During the prevalence of small-pox a separate hospital was set apart for persons suffering from it.

On the appearance of a disease at all resembling cholera, another separate hospital was set up at a considerable distance for the reception of all suspicious cases; one section of it being for such cases while under observation, and the other for declared cases.

VI.—Labour.—The kinds of labour at which the paupers were employed were—

(1.) Spinning cotton thread.

(2.) Making bán rope from Bhabár grass.

(3.) Weaving cloth from thread made in the poor-house.

(4.) Sprinkling dry earth and other conservancy work in the poor-house.

(5.) Occasionally at filling tanks, digging drains, &c., in the neighbourhood.

Raw material was purchased through the tahsíldar, by whom it was given out to the muharrirs of the poor-house.

The muharrirs distributed to the chaprasi of each barrack the amount of raw material required, taking a receipt from him. In the evening the chaprasi returned to the muharrir the thread or rope prepared, and got a receipt for the amount returned.

Prepared material was then sent up to the Collector's office, where it was kept for sale under the charge of a special muharrir.

Daily stock returns supported by receipts were submitted by the tahsíldar, poor-house muharrir, and sadar godown muharrir.

VII.—Miscellaneous.—1. During the cold weather "razais" of cloth stuffed with rags were supplied to the more naked paupers at a cost of 4½ annas each.

Clothes were also prepared from the cloth woven in the poor-house. The clothes were stamped to prevent their being sold, but paupers on leaving were allowed to take their poor-house clothes with them.

2. Smoking and the use of fire were strictly prohibited in the poor-house.

3. The punishments inflicted for breach of discipline were—

1. Confinement during the day (with extra work) in the lock-up.

2. Short allowance of food for one or more days to those who could bear it.

3. Ejection from the poor-house for those who were in fit condition.

Mr. Sandys.—The quantity of flour, dál, and salt required was supplied daily by a dealer and made over by the tahsíldar or peshkar to the cooking department. No grain was stored or made over to the inmates of the poor-house to be ground. Most of the paupers were so much reduced before they applied for admission that they would at once have eaten unground any grain that might have been given them to grind.

For Muhammadans the cooking was done by contractors, and for Hindus by Brahman and Kahár cooks.

The number of chapáttis prepared and dál cooked had to be regulated by the number of inmates at the time in the poor-house and number of applicants on the previous day, and the quantity, if any, not distributed on the former day. The tahsíldar or peshkar informed the contractor and the cooks as to the amount of food required and kept an account of the quantity of flour and dál supplied. To infants and those who were much emaciated, milk was given, and those who were sick with the exception of those who were suffering from small-pox or were lepers, were sent to the dispensary for treatment. It was assumed that every seer of flour produced 1½ seer weight of cooked food. The weight was every second or third day tested by the tahsíldar. The paupers were required to sit down in lines within their enclosures, and the food was given to each one of them and eaten at once by them, the tahsíldar or peshkar and one or more of the members of the committee being always present at the distribution, and taking care that proper discipline was maintained, and that the food was eaten, or at least most of it, at the time, and that the children received their own portions. During the severe cold the larger number of the paupers slept at night inside brick buildings or enclosed verandahs; a few were supplied with the ordinary clothes worn by natives of this country and of their class at a cost of Rs. 24-10-6. The cost of the cheapest blanket procurable in this district is Re. 1-8-0, and a large number could not be purchased quickly or be made up very rapidly.

No hour was fixed for the rising of the paupers. They were usually up soon after sunrise and were almost all too weak and emaciated to wash or bathe, to which the class who came to the poor-house are not addicted at the best of times. By about 10 a.m., and before, when the numbers lessened, the entries in the registers had been compared with the numbers and names on the tickets, by the several muharrirs, and after this, distribution of the food commenced. No work was carried on outside the poor-house enclosure, but those who were able were employed in making about half a seer of rope or in the manufacture of three to four yards of cloth daily, and the women in spinning one chittack of cotton daily or assisting at the looms; such children as were able to do any work assisted their parents. The poor-house was visited by the Civil Surgeon, and the sick, when not ill enough to be sent to the dispensary, were treated by a Native Doctor deputed by the Deputy Surgeon-General, and whose services were paid for from the poor-house fund. When the largest numbers were in the poor-house, viz., 1,548, the following establishment was entertained for cooking, sweeping, cleaning the latrines, maintaining discipline :—

3 Brahman cooks	@ 1½ anna a day.
1 Kahár	ditto.
3 Bhishtis	ditto.
4 Sweepers	ditto.
3 Chaukidars	ditto.
1 Muharrir	@ Rs. 10 per month.
1 Native Doctor	@ Rs. 20 ditto.

The municipal police also assisted in maintaining order and the municipal conservancy carts were employed in removing the filth from the latrines when the poor-house was opened in a block of empty buildings within the boundaries of the municipality. No establishment was kept up for sending the sick to the dispensary, and carrying out and burying the dead; charges on such accounts were defrayed from the poor-house fund. Paupers were employed in burying dead.

A superintendent, drawing not less than Rs. 30 per mensem, should be appointed to each poor-house.

A register showing the receipts and expenditure should be kept up at the Collector's office. It has not been found necessary to make payments more than once a week.

At the poor-house a register should be kept up showing the quantity of flour, dál, vegetable, and salt purchased and expended daily, and also a register in the form prescribed in Rule 6, Chapter II. of North-Western Provinces Government Circular No. 51A., dated 11th May 1878. The Native Doctor in charge of the hospital should be required to submit a daily return to Collector, showing the number of patients in hospital, the diseases from which they are suffering, and also the number of the inmates treated but not bad enough to be sent to the hospital, and nature of their complaints.

Mr. J. Kennedy.—An official member of committee, secretary to municipality if possible, should purchase food through contractors, and direct a supply for three days in advance to be sent in and stored in the godown; weighed on receipt by stock-keeper in presence of member of committee, who should make out a receipt, to be signed by stockkeeper, initialed by committee man (this receipt will be a voucher which the contractor should give in for payment).

The amount of grain thus to be entered in stock register kept in this form by the daffadar or stock-keeper :—

Date and month.	Wheat	Gram.	Barley.	Flour of Wheat.	Flour of Gram.	Flour of Bijra.	Bijra.	Dál, arhar.	Dál, múng.	Salt.	Chillies.	Oil.	Rice.	Sugar.	Milk.	Tobacco.

The grain given out for grinding should be weighed by stock-keeper in the early morning.

At rate of five seers per head, or half a maund per mill, four women grinding at each mill, sifting, &c. It should in the evening be received back (a special chaprasi and assistant writer looking after the people at work) and weighed.

Bran, loss, &c., recorded in following form :—

Date and month.	Number of mills.	Grain given.	Received.			Remarks.
			Flour.	Bran.	Loss.	

In the morning at daybreak, sufficient quantity should be weighed by stock-keeper, two cooks and assistant writer in charge cook-rooms to enable them to commence kneading, and balance of the amount required should be afterwards shown to the stock-keeper by the darogah or superintendent, who should obtain information necessary and keep a detailed diet book, of which an extract of one day at Sháhjaháupur poor-house is given as a specimen.

Each assistant writer (mate muharrir) calculates his required amount after calling the roll.

The darogah, with assistance of head writer and member of committee, calculates and checks the totals, and the day's entry is initialed by native member of committee for the day.

For sick and infirm the native doctor receives the meal, &c., which should be of wheat only, he having given a separate voucher.

The food should be kneaded in wooden or iron troughs and cooked on iron plates, similar to those used by Sikhs for Hindus, and in underground ovens for Muhammadans and Chamars; the dál or vegetables boiled in brass vessels or degs.

Thirty seers fuel are required per maund meal, with its proportion of dál or vegetables.

The weight of cooked rations should be 1½ times that of meal. The weight is tested by the special mate muharrir in charge of cook-rooms in presence of native member of committee, who presides over the distribution and indeed generally distributes with his own hands according to the scale noted on the wooden ticket of each pauper; the paupers all being seated on the ground in their inclosure according to the roll on the minor register kept by the mate muharrir in charge of the section, who calls over the names as food is given.

The people sit down and eat on the spot from 12 noon to 2 p.m.

All should rise at daybreak, have roll called before 8 a.m., have food distributed between 12 and 2.

Those working do so from 7 a.m. to 12, the afternoon being given for ablution, rest, washing clothes, &c.

In sections a pauper mate is told off for every 25, he assists in conveying to hospital those observed to be ailing, and to separate those requiring medicine only.

The work suitable to paupers is grinding corn for women blind and lame, making thread, weaving (the class of weavers, both Hindu and Muhammadan, being very poor, and furnishing many inmates), sprinkling earth about the inclosures suitable for children. One of the paupers to 20 or 25 told off as a mate, and expected to look after the others, under authority of mate muharrir over his section.

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Labour can only be enforced by a threat to turn out a disobedient or idle inmate, or to withold portion of food. The establishment required is—

One paid cook and one pauper cook, Brahman, for 200 paupers can knead and cook one maund.
One kahár paid, 1 pauper } for 500 paupers.
One bhisti or waterman }
One barber - " "
One sweeper (paid) for two inclosures - " "

And besides the 12 for the latrines (paid), *viz.*, two men and one woman for each of the four latrines.

A party of Chamár inmates, about 2 per cent., told off for burying the dead, carrying the sick and new admissions to hospital. Grinding corn done by paupers 4 per cent. of population.

Also this establishment—	Rs.
One darogah or superintendent per mensem @	25
One muharrir head writer - - -	15
One jamadar stock-keeper - -	12
One assistant writer - - - -	8

Assistant muharrirs 1 to 200 paupers, Rs. 5 each.

The large number of applications for posts at Rs. 5 a month showed how much educated persons fall out of employ, and need a kind of relief in times of pressure and famine.

The following registers are necessary, the forms given appended:—

I.—General register.
II.—Minor (for each section).
III.—Detail diet-book.
IV.—Diet register.
V.—Stock book, grain, &c.
VI.—Inventory poor-house property, cooking pots, &c.
VII.—Mill book.
VIII.—Establishment acquaintance.
IX.—Factory.
X.—Order book, committee and manager.
XI.—Superintendent's journal or roznamcha.
XII.—Superintendent's petty cash book.
XIII.—Nominal roll of deaths.
XIV.—Burial charges account.
XV.—Clothing register.
XVI.—Account of bran, &c.

General.

XVII.—Grain account.
XVIII.—Cash account.
XIX.—Ledger.

Hospital.

I.—Register.
II.—Daily morning state.
III.—Diet account.
IV.—Nominal roll of deaths.
V.—Monthly return of sick.

House relief would undoubtedly be popular, but it would be liable to great abuse. It was the only mode of relief which was largely sought for last year. I have already stated in para. 25 the grounds of the popular prejudice against poor-houses; part of this prejudice is undoubtedly well founded, part is based upon absurd suspicion of the designs of Government. At first last year no paupers would come to the poor-house in the Jalálabád tahsíl; afterwards by unfortunate arrangements for relief works the poor-house became overcrowded, having over 5,500 persons in it at one time.

Dr. Freyer.—The management of poor-houses should be entrusted to local committees. At the sudder station the committee would consist of the European and Native gentlemen of the place, with the Magistrate as chairman, who being under the orders of the Commissioner of the division, would communicate from time to time to the committee the views of the Supreme Government. The poor-houses at out-stations in the district should be managed also by local committees, but the tahsíldar or a Deputy Magistrate should be held responsible for its proper working. At the sudder station the poor-house should be visited daily by one of the members of committee at a certain hour in the morning, when he should decide as to the persons that are to be admitted and rejected respectively. He should visit every part of the poor-house, hear and decide complaints, inspect the cook-house, test the bread as to quality and weight, and notice particularly the sanitary state of every part of the poor-house. The Magistrate and Civil Surgeon should visit the poor-house at uncertain hours as frequently as practicable. It would be well that they should do so together once a week, so that in consultation on the spot they might introduce any changes that might seem necessary with reference to sanitation, food, &c.

The poor-houses at the out-stations should be managed in the same way if possible. They should be inspected once a month at least by the Civil Surgeon and one of the Magistrate's assistants; when practicable more frequently.

One of the most important points in the organization of a poor-house is to obtain an honest and trustworthy man to place in charge, who should live on the spot and carry into effect the orders of the committee. Such a man as this should be of a respectable family and of good caste and character, and should be allowed a liberal salary.

As a poor-house will always be established in the vicinity of a town of more or less importance, food-grains should not be purchased and stored. A contract should be entered into with one of the most respectable grain dealers in the place, who should be required to deliver the quantity of flour required daily at the poor-house. He should be informed daily of the probable quantity of flour that will be required. The muharrir in charge of the poor-house can always supply this information, as well as the number of diets required for adults, children, &c. The Hospital Assistant can supply information as to the number and kinds of diets required for the sick.

The bread should be baked in chapatis, each containing 2 chittacks; this is best and most economically effected in ovens (tandúrs). Fuel should be allowed at the rate of 6 chittacks per adult for cooking purposes. One seer of flour should weigh about one seer and a half when baked into bread. The bread should be tested by the muharrir in charge, and also by the Hospital Assistant, and daily by the member of committee who attends. The Civil Surgeon should also test the bread at his visits.

Whilst the bread is being served out and eaten, the paupers should be made to sit in rows along the sides of the squares which they occupy and arranged in groups of 25. There should be one of the warders always present to see that each person eats the portion of food allotted to him, and that the children are not deprived of their portions.

Persons who come to the poor-house in a naked or ragged condition should be supplied with clothing. The description and quantity will vary according to the season of the year. In the hot weather very little clothing will suffice, but in the cold weather it will be necessary to supply each person with a warm blanket jacket, and in addition one blanket should be allowed to each inmate. The cost of clothing, omitting the blanket, will be about one rupee per head, including women and children. Each blanket will cost about one rupee.

In the hot weather the inmates of the poor-house should rise at 6 a.m and go to sleep at 6 p.m. In the cold weather these hours should be altered to 7 a.m. and 5 p.m.

All the paupers should be made to bathe at least twice a week. This may be effected within the poor-house enclosure by the construction of small reservoirs, in which the water should be changed as frequently as possible. They will, of course, have to be situated near the wells or tanks from which the water-supply is obtained. If, however, there are tanks or a river in the neighbourhood of the poor-house, it would be an excellent plan to have the paupers led out in gangs daily for ablution purposes.

The roll should be called at 6 a.m. and at 6 p.m., and also at the distribution of food. I consider that the tickets with which the paupers should be supplied should be collected in the evening and again distributed in the morning. In this way the paupers will be prevented from doing as I have frequently observed, namely, retiring to the nearest bazaar in the evening, carrying the ticket with them, and returning again in the morning at 10 or 11 a.m. Should the ticket be collected at 6 p.m. and distributed at 6 a.m., this practice will be effectually prevented.

The Hospital Assistant in charge should inspect all the inmates of the poor-house two or three times daily and see that persons who require it are taken to hospital at once. Those who are suffering from trifling ailments may be treated in their respective huts; and the Hospital Assistant, who should reside within the poor-house enclosure, should have a small dispensary at which to dispense medicines to the paupers on application for medical relief. The dispensary should be placed in a hut near that in which the Hospital Assistant resides.

The establishment required per hundred paupers is as follows:—

For cooking - - -	2
Sweeping and cleaning latrines -	2
Maintaining discipline - -	1
Fetching water - - - -	1

The other duties mentioned, such as removing the sick, carrying out and burying the dead, &c., may be done by persons selected from amongst the paupers.

Dr. Planck.—One very important point in regard to this question is the necessity of determining who shall be the superintendent of the poor-house.

I think wherever a poor-house is in existence, whether permanent or temporary, the civil surgeon of the district should be its superintendent. It has often occurred to me that that portion of the duty of a civil surgeon for which he receives his salary proper has never been definitely ruled. If it ever is ruled, I think the duty of working for the relief of distress amongst the people should be strongly insisted on, and especially the duty of accepting the superintendence of the local poor-house, and of organizing and superintending all temporary poor-houses established during any period of famine prevalence.

In many of the important cities and towns permanent poor-houses are in existence, and I think I have seen all of them. In ordinary times the inmates are principally lepers and blind persons, but paupers found in a starving condition anywhere in the district are admitted to these poor-houses by order of the magistrates. In times of famine prevalence they are overcrowded, especially at the commencement of the period of distress before temporary poor-houses are established and towards the end of the period, when the temporary poor-houses are broken up.

I do not think any of these permanent establishments are well managed. I have noticed often that such of the inmates as can move about beg in the day-time in the neighbouring town. The diet is insufficient, the sexes are not divided, there is no orderly arrangement of inmates at night-time; sometimes as many as 10 persons may be found sleeping in a space which would be considered fit only for one or two in a prison; the inmates indeed huddling together, as a common custom, for warmth's sake, in cold nights. The generally extremely insanitary nature of the management, at times when the poor-house is overcrowded, may best be seen by an unexpected visit at early dawn, while the inmates still sleep.

The result of such visit to any educated observer is likely to be a penetrating belief in the real misery of a destitute pauper's life in India, and a lasting desire that something real should be effected towards its relief.

I think the Government should take a more decided part in the management of these permanent institutions; that money should be set apart for their better maintenance. I think inquiry will show that something of this nature was attempted by the native Governments which preceded our own. I think a record of perfect statistics in connection with these institutions should be insisted on, so that the Government may be reliably informed as to who these destitute people are, what has brought them to destitution, what has been done for their relief, and its results. In thus expressing my opinion I wish to specially guard against the idea that anything of extended poor relief after the English fashion is intended. Nothing of that sort could be attempted in this country of many poor. On the contrary, I think that admission to such poor-houses as I have in mind should only be by order of a magistrate, in favour only of destitute homeless persons threatened by death from starvation.

That all the important statistical and other information on this subject, which I think ought to be recorded, should be presented to Government in a convenient shape, easy of immediate comprehension, I think an inspector of poor-houses should be appointed, to whom authority should be given to require the submission of monthly returns from the superintendents of poor-houses, to inspect the poor-houses, and point out any necessary improvements in the management; and who should be required to submit an annual report to Government on poor relief generally, containing a history of poverty for the year; an account of the classes of the people found destitute; an account of the poor-houses, of the management and condition of their inmates, of the results of the management. The report to conclude with the statistics of the institutions for the year.

I think that, better managed, these permanent institutions might form a nucleus from which effectively administered relief might expand in times of famine prevalence.

Certainly they would teach what relief must be to save the maximum of life in persons who have gradually passed through the condition of distress which ends in starvation threatening death; would teach how a considerable company of such persons may be brought together and managed, so as not to sadden the good desire of relief, with a shade of doubt as to the reality of any good effected by the means employed. Efficient poor relief may seem an easy thing to those who look on the surface of the matter only, but in reality it is a difficult business. Special knowledge of the poor concerned is necessary, their habits and peculiarities. Much practice in management is necessary, and above all a knowledge of what constitutes life in health, how it is attained to when lost, on what its maintenance depends.

I think a temporary poor-house established in a grove, as before described, should be managed by a superintendent, who should visit the poor-house at least once a day. The superintendent should appoint a darogah or *master* to the poor-house; the darogah, if possible, to be a man who has had experience in the management of distressed poor. The darogah to reside at the poor-house in a hut made for him, and not to be absent without leave. Two paid chaprasis or assistants to be placed under the darogah's orders.

Admissions to the temporary poor-house should be made by the superintendent at his daily visit, and a register of admissions and particulars of discharge should be kept by the darogah in the following form:—

REGISTER of ADMISSIONS to the Poor-house at ——— with particulars of discharge.

Admissions.									Particulars of Discharge.			
Number.	Date.	Name.	Caste.	Age.	Weight in Seers.	Village.	Immediate cause of Destitution.	Diet ordered.	Date of Discharge.	Weight on Discharge.	Date of Death.	Date of Absconding.
1												
2												
3												
&c.												

NOTE.—The particulars of admission should be entered at the time of admission. The particulars of discharge on the day of discharge, death, or absconding.

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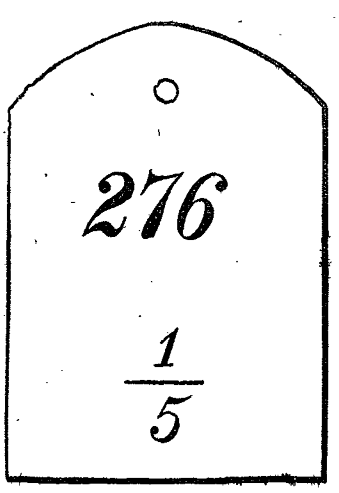
Each person on admission should receive a wooden number ticket, showing register number and date of admission thus:—



The figures to be branded on the ticket, which is to hang round the pauper's neck at all times.

The principal points to be attended to in the conduct of a poor-house are:—

1st.—The careful division of the sexes.

2nd.—Orderly arrangement of the paupers by day and night.

3rd.—The careful preparation and distribution of the food, the supply of good drinking water.

4th.—The maintenance of perfect cleanliness in and around the poor-house.

5th.—The division of the sick from the healthy.

As shown in the plan previously given, I think every poor-house should consist of a male and a female side; men and boys to inhabit the former; women, girls, and children the latter. It is true that a thin grass wall does not provide a very reliable means of division; but when the women and girls are kept together they can take care of themselves very well if they wish to do so, and to give them that opportunity is all that can be practically attempted in this direction.

The orderly management of the inmates in the day-time depends in great measure upon their employment in some useful way. At first much employment may be found for them in the improvement of their temporary home and its site. Always a considerable amount of employment will be provided by the daily necessities of the situation: sweeping for cleanliness; washing with clay water of compartment floors and diet places for smoothness, permanence, and wholesomeness; repairs of walls and roofs; and some of the inmates will be employed in ministering to the wants of the more feeble or emaciated, feeding them, rubbing them with the ghi of No. 4 diet, and otherwise helping towards their recovery.

Other of the inmates will be employed for the maintenance of order generally, and as assistants to the darogah. The preparation of the diets and their distribution, the proper collection and care of the drinking water, will provide employment for several persons. For I think that, managed by a competent darogah, no money for wages at all, excepting for himself and his chaprasis, would have to be expended in a poor-house. If the diet is good of its kind and sufficient, the people will not desire to evade employment in return for it. Of course if no mehters or kahars or bhistis can be found amongst the inmates it will be necessary to employ one mehter and one water-carrier for each side of the house, but not otherwise. The corn grinding will employ many women.

But when all these necessities have been arranged for, there will assuredly remain a considerable company of persons without employment, whereas employment in some form or other, lasting over several hours of the day, is essential for good management; and something of useful employment must be devised for the idle ones. I think there are two forms of employment very suitable for the inmates of a poor-house: the making of *múnj* string, and the manufacture of coarse cloth or *garrah*. The making of *múnj* string is the best of the two, if sufficient *múnj* can be obtained in the neighbourhood. Every native of common sense can make it; and if fairly well made, it will command a sale everywhere. But I think a certain number of the inmates may be usefully employed to make *garrah*, not for sale, but for distribution to such of the inmates as are nearly naked. The women and old men will spin raw cotton into thread; and on the men's side, either Hindu or Muhammadan weavers are pretty sure to be found who will weave it into *garrah*. By selecting, if possible, weavers who have wives and children on the female side, the weaving is likely to be well and expeditiously done, and the superintendent will then find himself in a position to remedy in some measure, at a cheap rate, the condition of nakedness so common amongst the inmates of a poor-house on first admission.

Hemp may be spun into string, coarse mats may be made from the leaves of the date-palm, baskets may be made from broom stalks, and in other ways employment may be provided, so that no capable person shall be quite idle all the day. But whatever is effected in this way should result from encouragement on one hand, and good feeling on the other, more than from any exacting of task-work. If that is found necessary the task must be light. Much in respect to the success of the endeavour to promote useful employment will depend upon the goodness and fulness of the diet given.

Orderly management in the night-time will depend entirely upon the sufficiency of the accommodation provided, and the division of the floors of the compartments into berth places, a berth place being allotted to each inmate. Strenuous endeavours should be made to ensure the reality of this allotment, and to ensure that an inmate lies in his or her allotted place during every night passed in the poor-house.

A trustworthy inmate of each compartment should be encouraged to report to the superintendent any infringement of the rule, provided that only 24 persons shall sleep in the compartment.

The fulness, careful preparation, and orderly distribution of the diet are *the* essential elements of successful management in a poor-house; upon it hinges the success, in every direction, of the endeavour; the willingness of the distressed people to stay, and be brought back to a condition of health and strength, their orderly behaviour, their willingness to accept employment—in greatest measure the lightness of the ratio of mortality amongst the inmates depends upon it; and if nowhere else, at least here the management must be thorough. In a previous section of this report I have entered certain diet scales which contain, I think, the necessary food elements to maintain life in health for persons of different ages, and to recover to health and fair condition persons of the ages mentioned who are emaciated from innutrition.

In considering this matter it is essential to bear in mind, and not only so, but to ensure the practical effect of such knowledge, that these diet scales are not food scales. The matter is of such importance as to necessitate detailed consideration.

The diet scale contains wheat flour, pulse, and salt so carefully and economically apportioned that, if food containing one-fifth less of any ingredient, certainly of either of the two first ingredients of the scale, should be habitually consumed, the person consuming such lessened allowance would be more likely to lose than gain weight after many days' experience of it. The important question then is—what amount of food will contain the *full* amount of the scale ingredients?

Any person who pleases may buy four chittacks of wheat flour and have it made into two cakes of well-cooked bread such as natives eat; and weighing the cakes he will find they weigh either a little more

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or a little less than six chittacks, according to the amount of cooking they have received; but six chittacks is the general average. It follows that ten chittacks of wheat flour will be contained in 15 chittacks of bread.

The established method of preparing dál, or pulse, for food is as follows:—To two chittacks of split dál, placed in a brass lota or narrow-mouthed vessel, eight chittacks of cold water are added. The water and dál are slowly boiled together until about one-third of the water has evaporated. There remains a thick gruel of dál to be eaten, which will weigh seven chittacks, and about fill a *half-pint measure.* Salt is stirred into this gruel, and it is eaten with bread broken into convenient pieces, to serve as spoons to lift the gruel. It follows that two chittacks of dál will be contained in seven chittacks, or half a pint of gruel.

One chittack of dry rice, when boiled, will weigh about three and a half chittacks. It follows that the six chittacks of dry rice of No. 4 diet, when cooked, will weigh 20 chittacks.

The diet scales then, when arranged as food scales, will have this appearance:—

No. 1 food diet	15 chittacks of wheaten bread.
	7 „ „ dál gruel.
	¼ chittack „ salt.
No. 2 food diet	12 chittacks „ wheaten bread.
	5½ „ „ dál gruel.
	¼ chittack „ salt.
No. 3 food diet	6 chittacks „ wheaten bread.
	3½ „ „ dál gruel.
	⅛ chittack „ salt.
No. 4 food diet	20 chittacks of boiled rice.
	6 „ „ dál gruel.
	¼ chittack „ salt.
No. 5 food diet	10 chittacks „ boiled rice.
	3 „ „ dál gruel.
	⅛ chittack „ salt.

For the proper cooking of the food it is necessary that the bread should be made into round cakes weighing about three chittacks each when cooked, and measuring not less than six inches across. Eight inches is the best width.

The dál should not be cooked in too large quantities together; a vessel for every four messes, or 96 adult persons, will at least be necessary, and it will have to be large enough to hold 72 pints (nine gallons) of water, in which 12 seers of dál will have to be boiled until 48 pints (six gallons) of dál and water remain. When the boiling is finished, 24 chittacks of salt will have to be stirred into the 48 pints.

Before the distribution of the food commences every inmate should be seated in his diet space, and silence should be maintained. Two cooks, one having two assistants carrying bread, and the other two carrying the vessel of dál, will pass along the central passage of the diet spaces. The first cook should weigh out, with rough scales, 15 chittacks of bread to each adult inmate, and the second cook should measure a full half pint of dál gruel to each, using for the purpose of measurement a stout vessel of that capacity attached to a long handle; and the dál should be stirred before each measurement from the bottom upwards.

When necessary, a pauper should be furnished with an earthen cup to hold his portion of dál.

The diets of the women and children should be distributed in the same manner.

In some poor-houses I have seen the bread served out in full quantity, that is, 12 chittacks of bread, when the diet allowed was eight chittacks of flour. But I have never yet seen a poor-house in which the dál was being distributed in full quantity. It is certainly not easy to ensure that this most important item of diet is being given in full quantity, because of the necessity of boiling it with much water. But it may be laid down as a rule worthy of dependence that if half a pint, or a tumbler full, of the gruel weighs seven chittacks, it will contain two chittacks of cooked dál.

To ensure that the food is eaten when received, and not sold or exchanged, a rule must be observed that no inmate should leave his diet space until he has eaten the food given to him, or until all the diets have been distributed and eaten. A diet space must be allotted to every person, great or small, entitled to a separate diet; and the diet spaces of the children should be separate from those of the women, so that all the children may be dieted together. Amongst the children will be many orphans, and for their management at all times, and the general control of the children at meal times, two well-disposed women inmates, who have no children, should be placed in charge of the children's diet spaces, to note that the children eat their food, and to help such as cannot properly feed themselves.

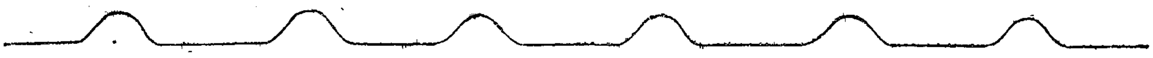
In connection with a temporary poor-house it will be necessary to request a certain number of native gentlemen to assume the position of visitors to the poor-house, and the Collector should make the necessary arrangements to ensure that two of these gentlemen are present, one on each side of the house, every day at meal times, to closely watch the proper distribution of the food. The superintendent, the darogah, and the chaprasis will all help in the same direction. And it should be ruled that the distribution of the food cannot be commenced until a visitor or officer of the institution is present to watch its distribution. Much valuable help in many ways may be rendered by the native gentlemen visitors, who should be encouraged to take an interest in the proceedings generally, and to express their views and opinions freely to the superintendent.

The clothing of the inmates of a temporary poor-house is an important matter, for clothing, next to food, is a necessity of healthful life, but its satisfactory accomplishment is a matter entailing much vexation.

Many of the inmates by stress of misery have become sly thieves; many have lost all the better feelings of mankind; the population is ever changing. I have in mind a poor-house which at no time contained more than 1,200 inmates, and yet in six months about 17,000 admissions were recorded.

To supply clothing to a fluctuating population of this description with anything like satisfactory results, it is necessary that it should cost little, be difficult to sell, hard to run away with, hardly worth stealing.

The subject divides itself into night clothing and day clothing. For night clothing or covering I would trust principally to a thick thatch overhead and to the good repair and perfection of the grass wall at the back of the sleeping shed. I would give every inmate a palm-leaf mat to sleep on, and during the cold season from November to March inclusive, would cover the floors of the compartments with a considerable quantity of dry grass, straw, or cane leaf spread over the mats; and in this case the margins of the compartment would have to be bounded by a mud wall about two feet high, and the divisions of the berth places be a raised ridge of earth about six inches high and round at the top, thus—



For day clothing I would undertake to give only *garrah* cloth, and that only to persons whose clothes were quite worn out; a *garrah* dhoti to a man or boy, and a *garrah* petticoat to a woman or girl.

I have seen cloth distributed in this way to the inmates of a poor-house, and noticed that, as a rule, it was plain *garrah* torn into strips of scanty length, narrow width, and poor substance.

The cloth should be specially woven for the purpose with a brown line down the centre and at each

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end of every piece; a dhoti piece being 10 feet long and 20 inches wide, a petticoat piece seven feet long and two and a half feet wide.

It is necessary to refer to the question of blanket distribution. I think it likely that many of the medical officers who answer these questions will counsel such distribution, and there can be no doubt that a blanket is a good thing for a distressed man, and the gift of a blanket to all such of the inmates of a poor-house as have none would be likely to benefit them greatly. I think it may be argued that blankets are given to prisoners; then why not to distressed paupers? If, as in the case of prisoners, it could be ensured that the pauper would retain his new blanket for any length of time, then I think blankets might be distributed with hope of conferring benefit commensurate with the great expense incurred; but as things are, I do not think the general distribution of blankets advisable. For warmth at night I would trust to the measures above detailed, spending a reasonable amount of money to make them thorough, on the grounds specially that, by their thoroughness, the great expense of general blanket distribution was saved. In a case of extreme distress, and resulting great emaciation or debility, I would give the pauper a blanket, leaving the determination of such cases to the superintendent.

I think the inmates of a poor-house should not be required to rise in the morning until sunrise; many will rise earlier, and should not be hindered in doing so.

I think, after they have got up, they should muster in the feeding spaces, and be counted by the darogah As the paupers' names would not be known, I do not see how a roll-call could be effected. Arranged in batches of 24, the counting of the inmates would be easy; and at the time of counting the darogah should note the results in a morning statement, thus—

MORNING STATE of the POOR-HOUSE

at __________ on the __________ 187 .

—	MALE SIDE.			FEMALE SIDE.						Total of both sides.	Total of previous day.
	Men.	Boys.	Total.	Suckling women with infants.	Women.	Girls.	Children below ten years. Female.	Children below ten years. Male.	Total.		
Able - -	152	136	288	24	201	106	72	83	486	774	750
Infirm - -	2	7	9	—	3	6	2	8	19	28	28
Total -	154	143	297	24	204	112	74	91	505	802	778

ABSTRACT of DIETS required.

No. 1.		No. 2.		No. 3.		No. 4.		No. 5.	
Men - -	152	Women,	201	Male children	72	Men -	2	Male children	2
Boys - -	136	Girls	106	Female children	83	Boys -	7	Female children	8
Suckling women,	24	—		—		Women	3		
						Girls -	6		
Total -	312	Total -	307	Total -	155	Total -	18	Total -	10

After the inmates have been counted they should be dismissed to their several employments for the day, principally, as I have before indicated, for the performance of a light task of weaving, string-making, &c., or for domestic occupations connected with the poor-house itself, grinding wheat and dál, cooking, sweeping, &c. I have seen a poor-house managed in this way, and it appeared to be well managed. A head cook for each side of the house might be necessary on first starting the institution; but poor Brahmans who will cook for a subsistence allowance of food are easily found. The hour for distributing the food should be that between 4 and 5 p.m., and every pauper should be lying down on his berth place by 8 p.m.

DAILY DIET REGISTER of the POOR-HOUSE at , on the 18 .

MONTH AND DATE.	No. 1 DIET.					No. 2 DIET.					No. 3 DIET.					No. 4 DIET.						No. 5 DIET.						TOTAL OF ALL.					
	Number of diets.	Wheat at 10 chittacks.	Dal at 2 chittacks.	Salt at ¼ chittack.	Wood at 1 seer.	Number of diets.	Wheat at 8 chittacks.	Dal at 1½ chittacks.	Salt at ¼ chittack.	Wood at 1 seer.	Number of diets.	Wheat at 4 chittacks.	Dal at 1 chittack.	Salt at ⅓ chittack.	Wood at ½ seer.	Number of diets.	Rice at 6 chittacks.	Dal at 2 chittacks.	Salt at ¼ chittack.	Ghi at 1 chittack.	Wood at 1 seer.	Number of diets.	Rice at 3 chittacks.	Dal at 1 chittack.	Salt at ⅓ chittack.	Ghi at ⅓ chittack.	Wood at ⅓ seer.	Wheat.	Dal.	Rice.	Salt.	Ghi.	Wood.
		M.s.c.	M.s.c.	M.s.c.	M.s.c.		M.s.c.	M. s. c.	M. s. c.	M.s.c.		M. s. c.	M.s.c.	M.s.c.	M.s.c.		M.s.c.	M.s.c.	M.s.c.	M.s.c.	M.s.c.		M.s.c.	M.s.c.	M.s.c.	M.s.c.	M.s.c.	M. s. c.	M. s. c.	M. s. c.	M. s. c.	M. s. c.	M. s. c.
1st August - -	312	4 35 0	0 39 0	0 4 14	7 32 0	307	3 33 8	0 28 12½	0 4 12¾	7 27 0	155	0 38 12	0 9 11	0 1 3½	1 37 8	18	0 6 12	0 2 4	0 0 4½	0 1 2	0 18 0	10	0 1 14	0 0 10	0 0 1¼	0 0 5	0 5 0	9 27 4	2 0 5½	0 8 10	0 11 4	0 1 7	17 39 8
2nd „ - -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

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A well for ablution purposes and for the washing of clothing should be set apart; it should be near to the poor-house, and four good-sized tubs, two on each side of the well, should be provided to hold the water necessary for these purposes. The mouth of the well should be covered with a grating; a wheel, bucket, and cord should be provided, and two paupers told off to keep the tubs constantly replenished with water. A good-sized slab of wood or stone should lie on the ground in front of each tub. The tubs on one side of the well should be for men, on the other for women and children. So much of arrangement for this important requisite of health should certainly be made, and the paupers should be encouraged to wash themselves, and wash and dry their clothes, during the midday hours of warmth. But in practice it will be found very difficult, if not impossible, to effect the personal cleanliness of the inmates, until they have recovered something of strength from good diet, or have obtained the essentials of clothing, in lieu of the rags they generally wear on first admission. For, as a rule, people in bad condition, the result of innutrition, or people badly clothed, do not wash, because experience has taught them that washing adds to their discomfort, and may, in their case, become a cause of disease.

On each side of every poor-house there should be a portion called the infirmary, and the assistant surgeon of the district civil hospital should have medical charge of the infirmaries, acting under the orders of the superintendent. The assistant surgeon should visit the infirmaries daily.

In the infirmary of a poor-house only cases of extreme emaciation, threatening life, should be admitted. All cases of disease proper, both in applicants for admission to the poor-house, or happening amongst the inmates, should be taken to the civil hospital for treatment, extra accommodation there being provided, if necessary. I think the darogah should be required to take note of any case of disease coming to his notice, and to call the attention of the superintendent to it at his daily visit. The superintendent to deal with the case as he thinks fit. The persons believed to be sick by the darogah should be required to sit in line at the infirmary at the time of superintendent's or assistant surgeon's visit. A supply of the commoner medicines, or mixtures of pills, should be kept in a box at the infirmary for administration by the assistant surgeon to inmates suffering from trifling ailment, but all cases of grave disease should be removed to the civil hospital.

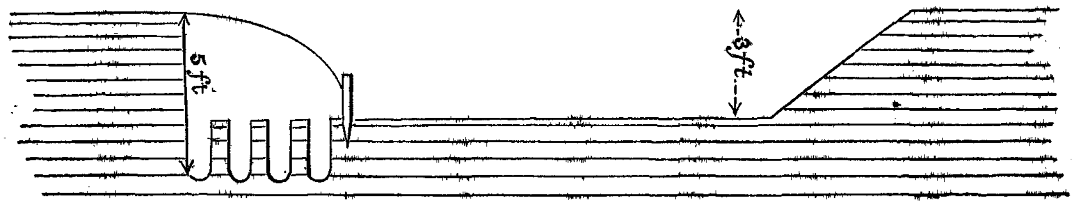
These sick persons should all be counted as belonging to the poor-house, and should carry their number tickets with them to hospital. In case of recovery they should come back to the poor-house. In case of death the word "dead" and date of death should be written on the ticket, which should be returned to the darogah, who will make the necessary entry in the register.

Inmates of the infirmary should receive No. 4 diet in two meals, and the ticket of every emaciated inmate dying in the infirmary should be returned to the darogah for the entry of the date of death in the register. Poor-house inmates of the civil hospital will be dieted in accordance with the rules of that establishment.

It is sad to write, but I know its truth, that, especially at its first opening, deaths are likely to be numerous amongst the inmates. In a well-managed poor-house these deaths should only happen in the infirmary portion or in the civil hospital. When the inmate of a poor-house dies, I think a great amount of consideration should be given to the decent interment of the remains. In the majority of instances death has been the last tribute paid to distress—that has been the sole cause, unavoidable distress; and the dead from such cause merit consideration.

I have seen many dying from this cause, and several dead; have noted the procedure in regard to their burial; have visited the burial places. The result has never been satisfactory.

I think the body of an inmate of a poor-house should be laid at full length soon after death. It should be carried on a short-legged charpoy from the place of death to the place of interment, covered with a coarse sheet of tát permanently attached to one side of the charpoy and attachable by strings to the other. The body should not be tumbled into the grave, but carefully let down, so that it may lie at full length, face upwards; and for this purpose the grave should be long enough to permit a man to stand in it at the head, and a man to stand in it at the feet of the corpse. It will probably be found very difficult, if not impossible, to provide a separate grave for each corpse; but, at least, every corpse should have a separate cell in the common grave. A waste piece of land in the neighbourhood of the poor-house should be selected as the burial ground, and a party of the inmates should be employed to dig a trench eight feet wide and three feet deep, the full length of the burial ground, and the bodies should be buried side by side in this trench, each in a separate cell dug two feet deep and six feet long in the floor of the trench, one foot in width of earth being left undug between each cell. Prepared in this way, a section of the common grave will have this appearance—



In a trench grave of this description the burials may be effected with a decency and reality difficult to accomplish with separate deep graves. The trench should slope at one end, so that the bearers may carry the charpoy into it without difficulty.

I need scarcely say that no Hindu, and very few Muhammadans, will touch the dead body of a stranger. It is absolutely essential for the success of this undertaking that two strong well-paid mehters of middle age should be appointed to prepare the corpse for burial, to place it on the charpoy, to lift and carry it to the trench, to dig the cell, place the body in it, and fill the cell in with earth well pressed down and levelled.

The portion of the trench utilized for burials in any day, having been marked off by a movable shutter or hurdle, should be as much as possible filled in with earth by the evening of that day. The people who dig the trench will fill it in, if the mehters have done their duty well in regard to the cell-interment in the floor of the trench.

It is likely that in any poor-house there may be several mehter inmates. If that should be the case, they should be employed to fill the trench and otherwise help towards the decent interment of the dead. But this important work of burial, which to my knowledge greatly needs improvement, cannot be left entirely in the hands of the pauper inmates, or in the hands of the police. It must be controlled by at least one trustworthy mehter, who should be encouraged in his office to such extent as to make it plain to his mind that the authorities attach great importance to the matter; do really desire, and have determined, that a person palpably dead of distress, or indeed from

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any other cause, shall have decent burial in a grave which jackals and other wild animals cannot disturb.

Every inmate at the time of receiving his or her number ticket should be cautioned to take care of it. It should be hung about the neck by a string, be described as Government property not to be thrown away, absconded with, or exchanged. Every day at meal time the inmates when assembled to receive their food should sit with the ticket hanging in front of the neck, and an inmate without a ticket should not receive his food without the express order of the darogah, who will refer to the register and issue a new ticket, if necessary. Only one thing should be required of inmates who wish to leave the poor-house, and that is, that they should present their number ticket to the darogah before leaving.

Whenever many of the inmates have recovered condition and strength, a considerable proportion of those recovered persons should be discharged from the poor-house to be received as labourers on the most conveniently situated famine relief work. The superintendent should select persons for discharge, and at the time of discharge the darogah should receive their number tickets.

The number tickets of inmates who leave or are discharged should be marked accordingly and placed in a box in the darogah's office; and in the evening the darogah will make the necessary entries in the register, guided by the tickets.

Carefully worked, I think this system of number tickets will necessitate the keeping of only one register of admissions, discharges, and deaths.

A register of food issued will be required. It may be kept in the following form :—

(*See table on page* 260.)

It will be observed that wheat, and not wheat-flour, is entered in the diet register. The loss of weight, resulting from the grinding of wheat into flour, averages about one seer in the maund, or one-fortieth part, which upon a diet of ten chittacks would be about ¼ of a chittack. I do not think any harm would result from so small a loss, but to rectify the trifling error, an increase of one-fortieth may be added to the total amount of wheat charged for in each day, which, for the day of example given above, would be 9 seers 8⅓ chittacks.

There is much advantage in entering wheat, and not flour, in the register, as then the total of the diet scales represents exactly the quantity of each article of food to be purchased of the grain merchant for each day.

The wheat will of course have to be ground into flour by the inmates of the poor-house, and much attention must be given to this important work. A compartment must be set apart as a grinding room. Its roof and walls must be good enough to keep out wind and rain, and its floor well beaten down, levelled, and often washed over with clay water. A sufficiency of grindstones of good quality must be provided, set out in order on the floor, and, as corn-grinding falls by established custom in this country to the lot of the women, the grinding room should be on the female side of the establishment.

Two women, sitting together at the stone, will grind 15 and even 20 seers a day at contract rates for a baniya in the bazaar, but I do not think more than 10 seers a day should be required in return for a subsistence allowance of food.

At that rate for the grinding of the 9 maunds 36 seers 12 chittacks of the entry for wheat in the diet register above, equal 397 seers, 40 pairs of grindstones would be required, and the grinding would give occupation to 80 women.

The task exacted from two women may appear light, but I have noticed that if a heavy grinding task is exacted the wheat is badly ground, and there is much delay in the grinding; whereas for the full advantage of the work it is necessary that the wheat should be very well ground, and the grinding completed early in the day, so that the cooks may not be hurried in the bread-making.

Concerning the supply of food articles, I think that should be arranged for with the most respectable baniya of the neighbouring town; certainly as regards all the articles of the diet scales of comparatively small quantity. In regard to wheat, the superintendent might be allowed to exercise his judgment as to the market from which it should be purchased, and it might be advantageous to keep a considerable store of wheat for poor-house use. But a weather-tight store-house must be provided, the wheat should be packed in bags containing a maund in weight each, and a police guard would probably be necessary.

Bengal.

BENGAL.

Mr. Kirkwood.—This question as to the organization of a poor-house has been somewhat touched on in answering Questions 24 and 25.

If Government has not imported grain, the grain required for a poor-house should be purchased wherever the largest stores are available within reach. It should be stored on *machans* (raised platforms) in a store-house erected for the purpose within the precincts of the poor-house. There should always be a month's supply in hand. Condiments, such as dall, fish, salt, oil, vegetables, and such miscellaneous articles as might be required should be purchased by the superintendent of the poor-house from an advance made for that purpose. He should purchase in the cheapest market near at hand. With a view of making him do so, the chief relief officer in each district or portion of a district should, on the 20th of each month, circulate to all poor-house superintendents a list of rates, above which charges will not be passed during the ensuing month. This list should be made up from the average of the prices current in the cheapest local markets.

The stock account of the grain should be kept as follows :—

Register (*A.*)—*Grain stock account*,—(1) name of poor-house, (2) month and date, (3) balance in hand, (4) quantity of any receipts during day as per chullan and whence received, (5) amount of short weight, (6) net amount received by superintendent, (7) quantity expended during the day, (8) balance in store at close of the day, (9) remarks.

N.B.—The "quantity" should always set forth both the number of bags and the weight of the grain, including the weight of bags.

The details of column 7 should be as follows :—

(*a.*) Weight of grain issued in cooked food.
(*b.*) Weight handed over to the hospital.
(*c.*) Weight distributed uncooked.
(*d.*) Any other expenditure of grain.
(*e.*) Weight of broken rice resulting from cleaning.
(*f.*) Weight of husk ditto ditto.
(*g.*) Weight of the bags in which the grain (*a.*) to (*f.*) was contained.

This register should be kept up daily by the poor-house superintendent.

If rice, the grain should be cleaned in a shed close to the store-house. It should be cleaned by poor-house labour. The total weight of (*a.*), (*e.*), and (*f.*) as above should equal the weight given to be cleaned. From this cleaning department the cleaned grain should be handed over to the cooking department. The storekeeper (who would be the poor-house superintendent) should make his issues to the cooking department in accordance with the numbers present at the last meal, unless he knows either of considerable admissions into, or of considerable numbers drafted out from, the poor-house in the interim. Such circumstances, of which he, being the superintendent, will of course be cognizant, should be taken into consideration. The feeding of the hospital (*i.e.* the sick) paupers should be entirely in the hands of the native doctor in charge of the hospital, and beyond issuing to him such grain as he may require, the superintendent would have nothing to do with their feeding. In the superintendent's own department no person should be getting special food unless under written orders from the native doctor of the hospital. That written order should be filed with the accounts; it should state the amount and nature of diet to be given. Any alteration in, or withdrawal of, this diet should be notified by another written order, also to be filed. Any surplus of food from one meal should be utilized at the next meal.

The food should be cooked in earthen pots. I do not know the necessary quantity of water or fuel. If rice, the cooked ration would be in bulk just about treble that of the uncooked clean grain. If dall, the cooked ration would be in bulk about eight times that of the uncooked. It should be the duty of the superintendent to test the food. It should be served out to the people in earthenware measures. The measures should be such as just to contain the cooked ration. Thus, whenever for a district the ration is decided on, the amount of the ration should be cooked in the presence of a trustworthy officer. Earthen pots (separately of course for grain, dall, &c.) should then be prepared of a size which will just hold the cooked ration. Several pots of each of these sizes having been prepared, some 50 of each size should be sent to each poor-house. They should bear distinctive marks (to be made while they are being baked), so that they may not be changed at the poor-house. Smaller salt and oil measures should be likewise made and supplied. In default of earthenware, tin should be used; but tin is objectionable on the score of caste. Otherwise than under special circumstances, I have already said that I would not have cooked food distribution anywhere except in hospitals (and of course in orphanages). I would have the poor-house a settlement of detached huts; and the food when cleaned should be served out uncooked, the superintendent going round each day (if necessary; I think somewhat less frequently would be equally efficacious) at a fixed hour to each hut, and serving out the allowances in bulk for the hut, allowing the occupants of the hut to divide it amongst themselves. One of the hut fraternity or sisterhood should be selected as the head of each hut, responsible in a great measure for its goings-on, and bound to render immediate information to the superintendent about absences or illnesses, and to report laziness at work, &c. This person should receive the food and should subdivide it; but if the denizens of the hut so request, it should be meted out to them individually. The fuel for cooking should at the same time be given in bulk for the hut, the occupants making their own arrangements for its distribution. The issues of food and fuel should be taken round in a cart, the necessary subordinates attending to weigh or measure them out.

If the food is given out cooked, and the people are not thus located in huts, there should be separate feeding enclosures (*a*) for special diet (*b*) for workers on ordinary diet, (*c*) for non-workers on ordinary diet Each of these should be subdivided into (1) an enclosure for Mahomedans and others not particular on the score of caste, (2) an enclosure for Hindus of the more respectable castes.

Each of these pens should be again subdivided into separate partitions (*w*) for men, (*x*) for women and children under five years of age, (*y*) for children between 10 and 15 years of age, (*z*) for children betweeen five and 10 years of age. Thus (omitting those on special diet) there should be 16 separate feeding compartments. These compartments should be in one block, and should be separated by partitions of mats or split bamboos about five feet high so as to prevent a person seeing from one into another. At the gate of each compartment a poor-house peon should be stationed to see that only those who should enter that compartment do so, and to prevent any disturbances without or within the enclosures. Every person should on admission be given a special seat in his compartment and should always at meal time sit there during his residence in a poor-house, subject, of course, to a change of compartment on a change of the class to which the person may belong. There should be six bricks placed flat in two rows of three each as a seat for each recipient. These pedestals should be at distances of three feet apart. On them the recipients should sit while taking their meal. This will prevent undue crowding and will tend to order. The superintendent or his assistant will then take the register of names (*vide* Question 24) and see, compartment by compartment, who is present and who is absent. As he proceeds along each compartment the cooks serving out the food should follow him, distributing as they go. Supposing that, as I have recommended, the numbers of any one poor-house are not allowed to exceed 500, this operation would take perhaps about an hour or a little more. It would, however, be better to have distribution going on in two places at once, the superintendent taking one-half with one set of cooks, and his assistant the other half with another set of cooks. The operation might then, together with due time allowed for eating, take one hour. The food should be first served out to the children, then to the women, and then to the men. The meal times should be twice a day, 10 a.m. and 5 p.m. If the weather is rainy it will be necessary to watch for a break in order to make the distribution. Indeed, it would be better then to make the distribution under cover, if there is any suitable spot. No talking above a whisper should be allowed while the meal is going on, except in answer to questions from the authorities. The cooks should bring from the cook-shed in baskets or (in the case of dall) in pots the cooked food of each compartment, and should set it down in an appropriate place in the compartment, whence it should be taken round in smaller receptacles by the distributing cooks, who should finally measure it out to the paupers in the approved ration measures, one taking the rice, one the dall, &c. Each pauper on coming into the poor-house should be given an earthen pot for rice, one for oil, one for dall, and one for water. These will not be replenished while he is in the poor-house, except for some special reason. When he leaves, he will be allowed to take these pots with him. The paupers will always bring these pots with them into the feeding enclosure. They will ordinarily provide themselves with drinking water, unless for sanitary reasons it may be thought better that watermen should be entertained to serve out drinking water to them at meal times. A stock of leaf-platters should be kept, and on these the meal should be served out to persons who may have broken or lost their pots. When the hour allotted for feeding has elapsed, the paupers should file out of the feeding compartments as they may wish. Non-residents should not, except on special permission, be allowed to take away any portion of their meal. Residents in the poor-house should be allowed to take with them any portion of their meal remaining. All should have left the feeding enclosure within half an hour of the conclusion of the distribution. A gong should then sound. I do not think food will be exchanged or sold if the distribution is thus managed and the recipients reside in the poor-house. I do not think that even the non-residents *i.e.* the persons who only come for the meal (a course to be allowed only when the famine is extreme and inadequate provision has been made to meet it), would to any considerable extent barter away the food thus obtained. The children will obtain sufficient protection against the danger of their food being purloined by the course above advocated. Except when the pangs of actual starvation have taken possession of a woman, I do not think she will rob her infant child eating by her side. I should say that, if she did so,

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there would be good grounds for an inquiry as to whether her own meal was not inadequate for her support.

Clothes will have to be supplied to each resident in the poor-house who may be in need of them. Blankets also will have to be issued for the rains and cold weather. If they can get an opportunity of bartering away their clothes and blankets, the paupers will frequently do so. Especially will the non-residents be transgressors in this respect, if such are allowed on the poor-house books. The only plan for checking such acts is steadily to refuse any further clothing to the person so acting, at all-events for some little time, and also (if the person is a male and physically capable of standing it) to administer a slight castigation. If the circumstances of out-door recipients are such that clothes and blankets must be given them, the distribution should be a single and final one. The clothes and blankets issued should, if possible, be of a special and easily recognizable pattern.

I cannot say exactly what the cost of such clothing would be, but I should imagine that it would not fall short on an average, for adults and children taken together, of two annas per mensem for each person. Clothes and blankets once issued should not be withdrawn when a person leaves the poor-house.

The inmates of a poor-house should rise at or before 6 a.m. in summer and 7 a.m. in winter. From rising time to 8 a.m. they should be induced to frequent the latrines with regularity. There should be separate latrines for men and women. They should be situated about 100 yards from any other part of the buildings. At 8 a.m, the paupers should be mustered and each person should have a certain quantity of oil poured on his or her head. This acts like soap, but if given into their hands is too apt to be used as food. From the head the oil is gradually rubbed over the rest of the body. After being thus anointed each person should move off to bathe, the peons of the establishment seeing that they do so. At the feeding time, when the superintendent goes round, any person who without cause is very filthy in appearance and does not appear to have bathed should be cut half the ration for that meal. There should be another muster at 9.30 a.m., in time for the paupers to be seated in their feeding enclosures by 10 a.m. After meal time the non-labourers should have the rest of the day to themselves, until the evening muster, which should be at 4.30 p.m., preparatory to the 5 p.m. meal. The people should wash their own clothes at the time of their bathing. In hospitals a special washerman will have to be entertained for washing the clothes. Wherever possible, a river should be used in preference to a tank for bathing and washing purposes. The workers in a poor-house should be called over at 7 a.m. and should work from 7 to 8.30 a.m., when they should muster for bathing. They should rest after their meal till 1 p.m., and should work again till 4.30 p.m., when they should muster for the evening meal. No work should be subsequently transacted. If the people are housed in large sheds, every such shed should be furnished with an oil lamp hung in the centre. In each shed one of the poor-house warders should sleep to maintain order and, so far as may be, decency. The people should retire for the night at any time they like before 8 p.m. At 8 p.m all should be quiet for the night. Each sleeping shed should be furnished with a *machân* of bamboos covered with earth. This *machân* should be about two feet from the floor. It should run round the sides of the building, and should be seven feet broad. Along the centre of the building there should be a passage about 10 feet broad. On this *machân* the people should sleep; it will be drier than the earth floor. Sleeping sheds should (where they are used) be about 24 feet broad and as long as may be required. The plinth of the earth floor should be two feet above the level of the ground. The shed should be thatched and have sides of mat or of bamboos or brushwood plastered over with mud. It should have one door. The ventilation should be at the top of the end walls and by a gap of about one and a half feet between the side walls and the thatch, which gap should have lattice work over it. A strip of gunny seven feet long, with a straw-stuffed roll at the end for a pillow, is recommended for bedding. The workers should have separate sleeping sheds from the non-workers, and males from females. Children should sleep in the women's sleeping shed, unless the relative in charge of them is a man. A person on first arrival should be allotted a sleeping place and should make resort thereto regularly. This place should, as far as possible, be amongst relatives or fellow castemen.

In a poor-house of separate huts and uncooked food, such as I have recommended, the only daily parade desirable would be a bathing parade; but after dark no person should be allowed outside the enclosure of his or her hut. But where that plan is not adopted, the gong calls during the day should be as follows: 6 a.m. getting up; 7 a.m. workers' roll-call; 8 a.m. bathing roll-call; 9.30 a.m. main roll-call preparatory to meal; 11.30 a.m. close of meal; 1 p.m. workers' roll-call; 4.30 p.m. roll-call for evening meal; 6.30 p.m. conclusion of meal; 8 p.m. quiet and sleep.

The native doctor of the hospital attached to the poor-house should daily, at the time of the morning meal, go through the poor-house people, pick out those who he may think should go to hospital, and prescribe special diet or medicine for such as he may think better to treat in the poor-house instead of in the hospital. He should also at this time examine the quality of the food supplied for the meal. After the morning meal is over all those for whom medicine may have been thus prescribed should attend at the dispensary attached to the hospital. The 9.30 a.m. roll-call should be the principal one of the day. It is then that new admissions should be made, and that persons should be selected for drafting on to the works. Every person should continuously wear his ticket round his neck. This wooden ticket should, as a distinctive mark, be painted white for those on special diet, red for workers, blue for non-residents. The only roll-call at which non-residents who are allowed to come for meals only need be present are the ones preliminary to the meals.

Where there is a large poor-house, and not a relief village, such as I have proposed, there would have to be separate sheds for work. Where the workers are not very numerous, the work could, for a great part, be carried on in their sleeping sheds. Spinning will be found the best sort of work for women. Other women should be employed on cleaning the grain. If any of the men are weavers, they may well be employed on weaving. Men, and such women as cannot manage spinning, may be advantageously employed on rope-making. Low-caste persons may be required to make baskets. Some of the men and women of appropriate caste should sweep the sheds and *leep* the floors and walls at appropriate intervals. The work exacted should, as far as possible, be by piece. A certain task should be allotted, with so many hours or days in which to complete it. If completed within the time, it should be remunerated in cash (in addition to the meals given) at such a rate as to give about one pice a day. If not finished within the time, a pice a day for the surplus time should be deducted from this remuneration. If all the remuneration thus vanishes, a deduction from the allotted meal should be made as a punishment for this laziness, or the person should be put on some more disagreeable task, or, in some cases, appropriate slight castigation should be administered.

The establishment required for a poor-house would be as follows: a superintendent on Rs. 30 to Rs. 50 per mensem. If the poor-house contains residents numbering 500 he should get Rs. 50; if 400, Rs. 40; if 300 or less, Rs. 30. He should be in charge of the whole poor-house as much as a jailor is in charge of a jail. Under him should be an assistant on Rs. 15 to Rs. 20, to assist him in writing up registers and in general supervision. The superintendent should give security in Rs. 200. He would receive an advance of Rs. 200 from which to make miscellaneous purchases. On his accounts (to be submitted weekly) being passed, he would be recouped the amount so passed. The bill for the establishment pay would be submitted on the first of the next month to the civil officer under whom the superintendent is working. On being passed, cash to the amount would be forwarded, and before the next establishment bill is submitted a quittance roll bearing the signature of each member of the establishment against the wage thus issued, in token of its receipt, should be sent to the civil officer.

The rest of the establishment should consist, per hundred paupers where cooked food is issued, of two cooks on Rs. 6 each, one waterman on Rs. 5, four peons on Rs. 5 each, two male sweepers on Rs. 5 each, and one female sweeper on Rs. 5.

I think this will be found about the correct strength. If uncooked food is supplied, the cooks and watermen would not be necessary and the peons might be reduced to two.

The sweepers should clean the latrines, and should (if there are no relatives or fellow-castemen to do it) bury the dead. At the corner of each sleeping shed and just outside should be placed two earthen-pots and some dry earth protected from the rain. These should form the night privies. They should be cleaned by the sweepers early every morning. Under the orders of the superintendent the peons would keep order and convey money to and from head-quarters, &c. Special labourers should be engaged for fetching wood for fuel, or grass for thatching. Some of the stronger paupers should, under the supervision of the peons, remove the sick to hospital, clean the grain, and assist in sweeping the sheds and enclosures. The cooks should usually be Brahmins, and the watermen persons of a good caste from whose hands no one would object to drink. The watermen should not only supply water for cooking, but should fill the water-crock of each person at meal times whenever such a course is considered desirable.

When there are about 500 people in the poor-house, the cooking-room should be about 30 feet long by 10 feet broad, and should form a fourth part of a shed 60 feet by 20 feet, of which the other three portions should be utilized (1) for cooling the food—the cooked rice should be spread on mats for this purpose; (2) for cleaning the grain; (3) for storing cooking-pots, mats, pots or baskets for carrying food into the enclosures, and fuel. With considerably fewer than 500 persons, the size of the shed could be reduced.

The following registers should be kept up besides the stock register (*A.*) already referred to; extracts from them should be submitted weekly (on every Sunday morning for the preceding week) to the civil officer in charge of the operations in the tract in which the poor-house is situated. He should compile them fortnightly for submission to the civil head of the district:—

(*B.*)—*Daily register of persons relieved.*—(1) name of poor-house; (2) month and date; (3) number of persons relieved capable of performing some work [these must be classified into (*a*) male adults, (*b*) female adults, (*c*) males between 15 and 10 years of age, (*d*) females between 15 and 10 years of age, (*e*) children between 5 and 10 years of age]; (4) number of persons (not on special diet) physically incapable of labour (to be classified as above, with the addition of (*f*) children under 5; (5) number of persons on special diet (to be classified as in column 4); (6) total number of persons relieved (classified as in column 4); (7) admissions during day (stating the class to which they belong); (8) struck off during day (stating the class to which they belong); (9) died during day (stating the class to which they belong); (10) uncooked weight of grain expended in relieving (separately for those entered in columns 3, 4, and 5); (11) amount of other articles in the shape of condiments expended (separately as above); (12) remarks.

N.B.—The entries for each meal must be separately made.

In the column of "remarks" refer to the condition of the people, mention any mortality, any epidemic, whence new admissions come, their condition, on whose authority admitted, whither those whose names have been struck off have been sent, and what arrangements made regarding them. Columns 6+8+9—7 of to-day should equal column 6 of yesterday. The column of remarks in the weekly extract should also show the number of persons in hospital at the beginning of the week, the number admitted into hospital during the week, the number discharged, and the number of deaths which have occurred in the hospital during the week, classifying the people as in column 4.

(*C.*)—*Daily cash account.*—(1) name of poor-house; (2) month and date; (3) balance in hand; (4) amount received; (5) total receipts; (6) expended in payment of establishment; (7) in erection of buildings; (8) in purchase of clothing; (9) in purchase of fuel; (10) in purchase of articles mentioned in column 11 of (*B.*); (11) in cash payment to working paupers; (12) in purchase of materials for work; (13) miscellaneous expenditure, with specification of its nature; (14) total expenditure; (15) balance in hand; (16) remarks.

N.B.—All expenditure entries will have to be supported by vouchers; entries in columns 7 and 8 must also be supported by written orders authorising the expenditure.

(*D.*)—*Daily work register, raw material stock account.*—(1) name of poor-house; (2) month and date; (3) amount of material in hand, with a separate sub-heading for each sort of material; (4) materials received, stating whence and how; (5) total materials, with sub-headings as above; (6) issues (with details) (7) balance in hand; (8) remarks.

(*E.*)—*Daily work register, manufactured goods.*—(1) name of poor-house; (2) month and date; (3) amount of manufactured goods in hand (with a separate sub-heading for each description); (4) amount received during day (with sub-headings as above); (5) total manufactured goods (with sub-headings as above); (6) manufactured goods sold (with sub-headings); (7) manufactured goods utilized in poor-house (with sub-headings); (8) manufactured goods sent elsewhere, and where sent (with sub-headings); (9) total issues (with sub-headings); (10) balance (with sub-headings); (11) details of money realizations for sales in column 6; (12) remarks.

N.B. — Realizations by these sales should be forwarded with the weekly return. Issues in columns 7 and 8 must be supported by written authority for thus disposing of the goods.

(*F.*)—*Daily work register, cash remuneration.*—(1) name of poor-house; (2) month and date; (3) number of people at work, specifying how many (*a*) males, (*b*) females, (*c*) children, for each sort of work; (4) cash remuneration given for each sort of work; (5) remarks.

N.B.—Under "remarks" should be stated any information about the quality of the work done, any fines inflicted, &c.

All the registers must be signed daily by the poor-house superintendent, who alone should be held responsible for the accuracy of the entries. Every inspecting officer after thorough test should sign the registers.

BOMBAY.

Ch. III. Qn. 27.

Bombay.

Mr. Hewlett.—The grain should be purchased in the bazaar and brought to the poor-house, where it should be placed in a locked storeroom. One of the committee should take charge of the department, and attend to see the grain given out to be ground by working paupers. After being ground it should be collected, weighed, and sufficient for the day's supply given to the cooks. A morning statement should be signed by the medical officer, showing the number of the inmates who require special treatment, and the number of those who require food once, twice, or three times a day. These should wear a distinguishing ticket.

The flour should be mixed with water and kneaded, and baked in cakes over a fireplace, which should consist of an iron plate supported on mud walls, under which the wood is lighted. Twelve ounces of fuel per adult, and six ounces for children, is sufficient, and great care is required to bake the cakes *light*, and not tough and indigestible. A cake consisting of one pound of flour should not contain more than two ounces of water, less if possible. Great care should be taken to see that the grain is ground fine enough and that it is well sieved, and that the coarser particles are removed, or else diarrhœa will ensue.

When the dinner hour arrives, the paupers should be made to sit in rows, the men by themselves, the women by themselves, and the children by themselves. It is especially necessary to separate the children from their parents, and if possible they should be fed out of sight of their parents.

Each pauper should have served out to him on first arrival an earthen dish. Simultaneously with the bread a ladleful of dhall soup should be served out. It is best poured over the bread, and when that is finished, a pint of gruel (*ambil*) should be given.

The food should be eaten in the presence of one of the members of the committee, and none should be taken away. Cumblees and sarees might be given to those absolutely requiring them, but great discrimination will be necessary, otherwise the paupers will clothe themselves in rags to excite commiseration.

Work should commence at 6 a.m. and be continued till 11 a.m., when the labourers should knock off for two hours and have the mid-day meal. At 2 p.m. work should be recommenced and continued till 5 p.m. On every alternate day the labourers should be allowed to leave work at ten o'clock, in order to wash themselves and their clothes. The non-workers should be made to wash themselves every day, and certain of the labourers should be told off to wash their clothes.

The medical officer should attend not less than three times a week at the feeding hour, and make an inspection of all the labourers, so that any requiring to be sent to hospital should not escape notice.

The establishment required per hundred would be two cooks, five grinders, three for conservancy purposes, two sweepers at latrine, two bhistees (paupers), and three woodcutters.

The sick should be taken to hospital on canvas stretchers slung from a bamboo and carried by two men. Three men should be employed in burying the dead.

Mr. Spry.—A poor-house should always be supervised by a committee. If at the sadar station, the Collector, Judge, Civil Surgeon, and other officers, together with any native non-official gentlemen who like to undertake the duty, should be on the committee. If at a taluka station, the Assistant Collector, Mamlatdar, Medical Officer (if any), together with native gentlemen, should form the committee. At branch houses, the Assistant Collector, Mamlatdar, the Government local town or village officials and Soucars should form the committee. In all cases the Collector should be the final referee for orders and instructions.

At each relief-house there should be a manager and also a secretary, who generally should be Government servants. A storekeeper is also necessary, and other officials according to circumstances.

Each committee can and should resolve itself into various sub-committees for the carrying out of particular objects, and these sub-committees should consist of members who have particular knowledge of the subjects they have to deal with. For instance there may be—

1. The Commissariat Sub-Committee, who would arrange for the purchase of all grain and articles required and see to the storing of them.
2. The Finance Sub-Committee, who should look to the accounts and audit them.
3. The Sanitary and Hospital Sub-Committee, who would look to all matters appertaining to their peculiar department.
4. Kitchen Sub-Committee, who would look after the kitchens, &c., and so on. Sub-Committees can be made according as they may be required.

Each committee should meet as often as they think fit, but should be required to submit reports of proceedings at the weekly meetings of the general committee, when matters requiring discussion can be settled.

Besides this, all members should take it in turns to attend at stated times for the purpose of receiving inmates and of seeing the paupers fed, &c.

The food should be purchased by or through the Commissariat Sub-Committee every week, and stored under their supervision in some secure building. They should forward the bills, countersigned "as admissible" to the Finance Sub-Committee for adjustment. The storekeeper should keep a daily register of amounts received and served out and balance of stock in hand. There should be a separate register, although in the same book, for each description of article. The relief-house manager would report to the Kitchen Committee the number of people probably to be provided for next day, and they would make a written indent on the Commissariat Committee for the amounts of food required. The Kitchen Committee should see to the grinding, which should be done in a building or shed close at hand, and the flour weighed after being ground. The manager would keep himself informed, from the muster-rolls, of the number admitted or discharged, and from the number in hospital, of the probable requirements. The grinding should be done by women requiring relief, but who from having infants or from other causes are unable to go to the ordinary works, but they should be strong and healthy women. The blind and lame can often be well employed as grinders. The task should be 8 seers a day. The flour should be received in two instalments—once at noon and once in the evening; the allowance for wastage being 5 or 6 tolas per seer, the flour being weighed against grain. The bread should be baked on large iron sheets, as they economise fuel more than the common iron platters. The other food should be cooked in large copper pots properly and regularly tinned. The amount of fuel depends entirely on the kind obtainable. The bread produced from half a seer of flour should, when fresh, weigh 62 tolas. The bread and other cooked rations should be tested by the members of the committee who attend at the feeding time, as also by the manager.

Before the food is produced, the people should be made to sit down in gangs and in rows, men, women, and children all separate, except in the case of children too young to feed themselves. On them their mothers must attend, but they must be very strictly watched. The muster should be first called, then the food brought in and distributed regularly row after row. Care must be taken that those who have received their rations do not slip into other rows. The feeding must be always in strongly protected enclosures, with different doors for ingress and egress.

The children should be made to eat their ration at-

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once; and the adults to the extent of half at least if they are fed only once a day; if oftener, then they should eat the whole.

Clothes should be given when either decency or the weather show the necessity. Cumblis or blankets, costing from annas 8 to Rupee 1 each, may be given, as also the coarsest country cloth for saris.

All the paupers should rise at daybreak, and then an hour devoted to necessary purposes, &c. After the hour work should begin and go on to 11 a.m., when there should be the roll-call, and then the distribution of food. At 2 p.m. the horn should again be sounded for work, which should be continued till sunset, and one hour after that the people should all be in their respective dormitories.

The sick of course and very small children must be washed at the relief-house itself, and daily.

Personal ablution twice a week and washing clothes once should be rendered compulsory on all paupers, and they should be marched for the purpose to the nearest nullah or river, so many gangs each day. Children should be washed daily.

The medical staff should at feeding time always attend and look at the paupers. They should also go the round of the sheds the first thing in the morning and the last in the evening. The muccadum of each gang should also send to hospital anyone suddenly taken ill.

Rope, net, and basket making is suitable to old and infirm men. Spinning and cleaning grain is most suitable for women and girls not strong enough for outdoor labour.

It is very difficult to get any task out of relief-house paupers. Supervision and having regular hours for work is as much as can be done. Those who do not work properly can be put to some description of work which they do not like, and thus punished.

The establishment required for 100 paupers is about as follows:—

4 cooks.
7 grinders.
5 sweepers.
4 water carriers (dependent on situation of water).
4 latrine cleaners and trench diggers.
2 muccadums or supervisors.
2 dhoolie bearers.
2 grave diggers and corpse bearers.

The first four classes can be selected out of the paupers, but I think the last four classes had better be people specially employed and paid full wages, strong men being selected. Old pensioners, if obtainable, make good muccadums.

There should be the—

1. Daily cash book.
2. Stock register (already described).
3. Muster-rolls.
4. Register of entries and dismissals.
5. Register of entries into hospital.
6. Birth and death register.
7. Register of paid establishment.
8. Register of work done, such as spinning, &c.

I should have added above that I think the fetching of grass and wood should not be done by the paupers; it is better to buy that in the open market.

Also that the children, the sick, and people under special treatment should be fed twice or even thrice a day under the instructions of the medical officer.

Colonel Anderson.—This very pregnant question I cannot attempt to answer in full detail; many of the points of detail are beyond my experience. I would, however, note that to children and sickly people food should never be given in the form of chupatees, which are often ill-baked and are always indigestible. Grain food should always be given to such classes in the form of pudding or stiff porridge. I found the greatest advantage result from changing from chupatees to pudding in these cases. It stands to reason that the food is more digestible in this form and therefore goes farther, and is alleviative if not entirely preventive of the diarrhœa so common among famine people, children especially. The ration of food should always be required to be eaten at the time it is served out, and should be given in two feeds a day to adults and three to children. The paupers should be required to do all the work of the relief-house with an addition of ¼ to the ration of those from whom duties involving any amount of real labour are required. All should every two or three days, at least, in the warm part of the day be walked out to any wet nullah or river in the vicinity and required to wash. A barber should be kept in the relief-house. One can generally be procured for his food, and all men's and children's heads be shaved, and those of as many of the women as desire it, which many will do, or at least to have their hair cut short. The officer in charge of the relief-houses should test the weight of the rations daily. This is a point of great importance, as from fraud or error mistakes are very liable to occur. As to amount of supervising establishment I have no notes, but selected men among the paupers may be usefully employed on many minor duties of this kind, giving those selected for this purpose an additional ¼ ration.

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Surgeon Gray.—The cheapest grain of the grains the paupers are accustomed to should be purchased by Government and stored up in a granary. It should be in charge of the grain depôt keeper, who should keep a register showing receipts, issues, and balances. This should be inspected from time to time by the deputy collector, assistant collector, or a Revenue official.

A person ought to grind 50 seers (of 84 tolas) per diem.

The food should be cooked in large copper vessels capable of containing 50 seers of grain. Copper vessels are essentially necessary for cooking when there are large numbers in camp and hospital. When there were nearly 1,500 paupers in the camp and hospital at Peapali, Kurnool District, the superintendent encountered very great difficulties in the department. According to orders of the collector he had to use earthen vessels. Under these circumstances food could not be prepared at the appointed hours. Food which should have been ready at between 8 and 9 a.m. was not ready until 12 noon and 1 p.m. The evening meal was proportionately late—6.30, 7, 7.30, 8 p.m. The cause of these difficulties was the earthen vessels, which could not be obtained large enough and strong enough. They were constantly breaking when on the fire-place. Moreover, food is boiled more quickly in metal vessels, because metal absorbs heat rapidly and parts with it slowly. When there are only 200 or 300, or even 500 in a camp, earthen vessels may be used. It is *not* economical to use earthen vessels in a very large camp.

Regarding the amount of water that rice and cholum require for boiling and the weight of 7 lb. (16 oz.) of each of these grains after boiling, I have ascertained the following by getting them boiled in my presence:—

Rice, 16 oz. require 56 oz. of water, and when boiled well no water remains in the vessel; the boiled rice weighs 54 oz.

Cholum, 16 oz. require 30 oz. of water; *the boiled cholum made into a ball weighs 32 oz.*

The superintendent should test the food. The food should be distributed to the people in tin measures made to contain a certain fixed amount of cooked food. The food should always be distributed *dry*, and not in water—as congee-water and rice—for in the Chingleput relief-camps I had occasion to bring to the notice of the sanitary commissioner that when food is distributed in this manner each person does not receive the proper amount of rice. Some receive *more* and some *less* than others. I might here mention that the dhall allowed to paupers should be cooked separately and not in the pepper-water, for in the Peapali relief-camp I have found that those first served get plain pepper-water, and those last served a large quantity of dhall, which must necessarily be the case, for the dhall will gravitate to the bottom.

While food is being served out and eaten great discipline is essential. The paupers should *sit* in lines in enclosures devoted to the different castes. They should not be allowed to *stand* up and yell for food. They should be made to eat their food on the spot, and not be allowed to take food into their sheds. Children who can walk should be arranged in lines away from the adults, and a warder should see that they eat their food and do not give it away to their parents. This is the plan adopted in the Peapali relief-camp hospital, and I find it answers its purpose.

During the close of the famine (as at the present time) when there are rains and cold winds, those who have no coverings should be supplied with gunny-bags and blankets. In the Peapali relief-camp we got the gunny-bags for nothing from the Government granary. A blanket costs between 14 annas and 1 rupee each. We divide this blanket into two pieces. Half a blanket is found ample. About 8 annas would be the cost *per head* for warm clothing.

In the hot weather paupers should rise at 5 a.m., in cold and rainy weather 6 or 6-30 a.m. They should bathe during the day. The roll-call should be between 7 and 8 a.m. Food should be distributed at 9 a.m. At 6 p.m all the paupers should be ordered into their sheds.

Near the latrines there should be a large bathing enclosure, where the paupers should be made to bathe and wash their clothes.

The medical officer should hold a general inspection of all the paupers two or three times a week, and weed out those who are beginning to sicken. Those paupers in the camp who are not sick enough for hospital may be mustered in the camp every morning for a dose of medicine or tonic. Those paupers who are suffering from trifling ulcers, which if neglected will become bad ones, should be collected and marched off daily to the hospital, in order to have their ulcers dressed. Dressing once a day for these cases is quite sufficient.

Paupers can be set to the following tasks :—

1. Sweeping.
2. Weeding.
3. Cleaning grain.
4. Grinding corn.
5. Cook-helps.

Women for cleaning and grinding corn and as cook-helps.

Men for sweeping and weeding ; women also, and children.

Paupers who are considered fit to do the camp work above enumerated and who will not do them should be punished, not by depriving them of food, a portion of their daily allowance, but by tying their hands up to a post fixed in the middle of the camp, so that they may be seen by all, and that other paupers might be warned. A pauper does not like to be tied up for an hour or two. This is the only punishment that can be awarded to a pauper. I have found this punishment useful in deterring paupers from defœcating anywhere and everywhere in the camp. This punishment will also be useful in making lazy paupers work.

Establishment per 150 *paupers.*

When there are about 1,000 paupers in camp—
One cook.
One sweeper (if paupers are not strong enough for this work).
One toty.
One warder (if 50 paupers are hutted in each shed, then one warder can be put in charge of three sheds).
One waterman.

The sweepers and toties can remove the sick to hospital. This is done in the Peapali relief-camp.

The establishment for carrying out and burying the dead depends on the mortality in the camp. If ten people die daily, four to carry and four to dig and bury will be found sufficient.

The above menials should be paid 6 rupees *per mensem without food* in the camp, but as they generally manage to get it, it would be best to pay them 2 rupees and give them food in the camp.

Major Baynes.—A poor-house must be divided into two branches; one allotted to ordinary inmates, who are persons not requiring a special diet or medical treatment; the other to those who do require special diet or medical aid. The former portion will be styled the "ordinary" poor-house, and the latter the "hospital" poor-house. Both portions must be further subdivided by a slight fence; one division should be set apart for the accommodation of caste inmates; the other should be assigned to pariahs.

Each of these subdivisions must be further divided into two portions; one to be occupied by the huts, which may be styled the "sleeping quarters," the other to be used for the issue of meals and for exercise, which may be called the "feeding enclosure." In the "sleeping quarters" families, single men and women, boys and girls should be put into separate huts; these huts should not be occupied during the day except in rainy weather.

The feeding enclosure must be divided by fences into three portions, in which men, women, and children over two years of age will be respectively fed.

To render the arrangements perfect, long sheds without side walls should be erected in the feeding enclosure ; otherwise heavy rains at meal times not only cause great inconvenience, but much sickness in the form of fever, resulting from severe chills; there were none in my poor-house, nor have I seen them in any other, but the want of them was a serious defect. One hundred people require an area of 140 feet in length by 14 in breadth in which to sit at meal time ; the cost of shelter at meal time would be about 4 annas per head. I would strongly advocate its provision.

All persons presenting themselves for admission on production of their ticket should be at once taken by the gate-keeper to the medical officer in charge, who after inspection tells them off either to the ordinary or hospital portion; in both cases he will send the tickets to the master for entry in the general register. He should receive back from the master the tickets of such persons as he detains in the hospital, with the general register number entered on it for entry into his own hospital register. Persons brought there by the police or camp patrols would be passed in without tickets; should any persons arrive after issue of the evening meal, whom the medical officer considers fit for the ordinary camp, he will detain and feed them in his general or convalescent ward, and send them to the master on the following morning. Persons brought in without ticket must be supplied with one by the medical officer, which he will send to the master for disposal according to instructions given in the case of ticket-holders.

Assuming 1,200 as the maximum number of inmates, the following fixed establishment will be necessary :—

		RS.	
1	House master on	50	
1	Medical officer of rank of passed hospital assistant.		
1	English writer	15	
2	Dispensers on	10	each.
2	Store-keepers on	20	„
2	Orderlies	6	„
2	Gate-keepers on	5	„
13	Warders on	6	„
1	Writer for camp master	15	„
1	Head constable and 4 privates.		

The strength of the establishment given below will vary with the number of the inmates :—

Gangsmen.—One to every one hundred inmates, pay Rupees 8.

Scavengers.—Two males to every one hundred inmates of the ordinary poor-house, and two males and one female to the same number in the hospital portion.

For any fraction of 100 more than twenty-five and less than fifty, one additional scavenger; and for any fraction over fifty, two scavengers.

Adults and children over two years should be divided into feeding gangs of 100 members ; each gang must be of the same or equal caste ; the adults should be further sub-divided into sexes ; this is impracticable in the case of children, as very little ones must go with their bigger sisters or brothers ; further, members of gangs must all receive the same ration ; inmates on twenty ounces must be separated from those on twenty-four. To each gang must be appointed a gangsman other than an inmate, he must read and write the vernacular of the taluk ; he will keep a nominal roll of his gang. He will be present at the issue of raw rations to his gang cooks ; he will muster his gang at the first meal-drum in the space assigned to it ; call the roll and give in to the master a report in form ; he will be also present during the issue and consumption of the cooked food, and will see that each member receives his proper ration ; he will maintain order in the ranks during meals, and will prevent any food being taken away ; gangs should be made to sit down in ranks of fifty facing inwards, with an interval between them of eight feet to afford a passage for the food distributors ; in the hospital portion gangsmen are only required in the convalescent ward.

In other wards of the hospital than the convalescent it will be necessary that the female patients should be attended by female scavengers ; their strength must be regulated, not only by the number of patients, but by the nature of the prevalent disease, and its determination must be left to the discretion of the medical officer subject to the approval of the European relief officer. At 5 a.m. the scavengers will remove the night chatties and clean out the latrines, and in the evening they will replace the chatties and again cleanse the latrines, and fill up the latrine water-pots. During the day they will remove the sweepings from the enclosure and will be employed in digging pits for reception of nightsoil.

Burials.—There should always be four vettyans attached to the hospital portion to remove and dispose of corpses, either by interment or cremation, unless the deceased has friends in the poor-house or outside who are willing to perform the funeral rites of his caste. The usual fee for cremation is one rupee ; for burial eight annas. They should be paid at the kacheri on voucher furnished by the master.

Cooks.—One male and three females to every gang in the ordinary poor-house and in the convalescent ward ; they must be strong and willing, for their duties are hard ; they have to clean, cook, and distribute the rations twice a day to 100 persons, and to cleanse their cooking and eating utensils ; they must be caste people ; if procurable, Vellalahs are the best, as all castes, except Brahmins, can eat food cooked by them, and so by employing them one of the causes which make the poor-house distasteful is removed. This of course entails payment of the cooks, but I am of opinion that the employment of inmates as cooks is objectionable ; they are, as a class, *filthy* in their habits, not sufficiently intelligent and rarely strong enough, and if they be strong enough, then they are able to go to a relief-work ; the cost of paid cooks is a mere bagatelle ; it does not exceed $2\frac{1}{2}$ annas per mensem for each inmate. They should receive their food, and in addition a money-payment of $1\frac{1}{2}$ annas per diem to males, and of 1 anna to females ; this would not be paid daily, but as a monthly wage, and would be liable to deduction by fines for bad conduct or by stoppages to make good a short delivery of rations.

Water-carriers.—Should be selected for carrying drinking-water from the caste ordinary inmates ; their duty is to fill up morning and evening the filter pots in the sleeping quarters and feeding enclosures and to supply the cook-room ; they will do this work for both branches of the poor-house. The pariahs can be employed in filling the pots in their own enclosure, but they should not have any connection with the kitchen-pots ; and the draw wells for use by pariahs must be distinct from those used by the caste people ; filters constructed out of three pots on a bamboo tripod should be placed at the end of each hut nearest the central partition ; at the cook-rooms and also at the corner of each feeding enclosure one filter of the ordinary dimensions for every fifty persons will be required.

Sweepers of the poor-house ; areas.—Should also be taken from the females and girls of the ordinary poor-house and convalescent ward of the hospital ; every morning on return from latrines they will sweep up the whole area of the ordinary poor-house under the superintendence of a warder, and also the feeding enclosures after each meal ; all rubbish collected should be deposited outside the enclosure in one spot, whence it will be removed by the scavengers. This duty will be performed in the contagious wards of the hospital by the scavengers.

Purchase, Issue, and Storage of Food.—It will, I think, be granted that the objects to be sought in the adoption of a system for the supply of grain to recipients of charity are the regular delivery of a sufficient quantity of wholesome grain, combined with the least outlay of money ; if these results can be obtained by dealing with local grain-sellers, I would advise the daily purchase from them of the daily requirements, for thereby the necessity of providing storage and the opportunity for peculation are limited ; but my experience shows that the adoption of this course is calculated to keep the price of grain needlessly high, because native traders will combine but not compete, and the cost of feeding the inmates of poor-houses was certainly enhanced by the monopoly of supply held by them. I only had one small importation of rice direct from Madras in the height of the famine. The saving on each bag was about $1\frac{1}{2}$ rupees, and local prices fall immediately but only temporarily. I am therefore of opinion that, if Government were able to supply their own poor-houses with grain, they would reduce their cost, but it must not be undertaken unless it can be carried through to the end.

On the assumption that the supplies are to be locally procured, I would recommend the following system :—On the evening of each day the master and the medical officer furnish their storekeepers with indents, for the amount of supplies required for their respective portion on the following day ; these indents should be framed upon the number of inmates shown in the state reports of the date of indent with a margin of 5 per cent. in excess to meet admissions during the next 24 hours ; these indents should be filed and checked in the tahsildar's office weekly by comparison with the daily state reports, which in their turn are checked by comparison with the gangsmen's nominal rolls ; copies of these indents should be filed by the master and medical officer.

At 6 the next morning the store-keepers bring to the poor-house and hospital store-rooms the amount of supplies specified in the indents given to them the preceding evening ; the articles are weighed or measured before the master and the medical officer, who attest the accuracy of their respective deliveries by affixing their signatures to the back of their indents which are given by the store-keepers to the contractor, who, on production of his account with these indents as vouchers, receives the amount due to him every Saturday at the tahsildar's or deputy tahsildar's treasury ; the prices of the articles supplied should be determined by the contract to be the same as those officially quoted in the tahsildar's grain report on day of payment.

The master and medical officer then receive the

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rations actually required by them for the morning meal, and they sign the store-keeper's register in proof of receipt, and the same process is repeated at 2 p.m. when the evening rations are drawn. The surplus that remains is very small, and is taken into stock by the store-keepers for subsequent distribution during the day if required on minor indents; for these subsequent issues they will obtain every evening, when they receive the indents for the next day, the signatures of the master or medical officer as the case may be, and their accounts must be made up and balanced every evening; every Saturday any surplus that has accumulated during the week is utilised and removed by a corresponding deduction made from the indents given on that day by the master and medical officer for supplies required on the Sunday. For example, if the master required 100 lbs. of rice on Sunday and his store-keeper's register showed 20 lbs. in stock, he would give an indent for 80 lbs. only; in this way the accumulation of stores is limited to a week.

Contingent Charges.—There are other minor supplies to be made, cooking pots, fire-wood, sulphur for fumigation, &c. The simplest method of supplying fire-wood is to allow a fixed daily sum for each 100 inmates. I found that 2 annas daily for wood and 1 anna for cooking and water-pots for each 100 was the average; it is only 10 pies per head for a month. Other contingent charges are very trifling, and can be safely left to the master or medical officer, who should be provided with a permanent advance of 10 rupees, the account of which will be kept by the store-keeper.

There is no occasion for a task, as the grain for each gang is given out by the master and medical officer to the female cooks of each gang; this is done in the morning and afternoon; the grain required for the morning meal is given out at 7 a.m., that for the afternoon at 3 p.m. in presence of each gangsman; the correct appropriation of the stores required for use in the hospital wards where patients cannot be fed at regular times and with fixed quantities must be left to the honesty and vigilance of the medical officer and his dispensers. The females husk or grind the grain, as the case may be, in the cleaning hut, which is simply a roofed in space without walls; no pots are allowed in this shed; one of the police guard should be present during the operation to prevent the cooks carrying grain away, or the ingress of other persons into the shed. As soon as the grain is reported ready for cooking, the master and medical officer (or, if engaged, one of his dispensers) see the grain and condiments measured into the pots of each gang or ward; the gangsmen should be present at this operation. When cooked, each gangs-cook turns it out of his pot into large shallow baskets, in which it is allowed to cool slightly, and, if balled in boiling, is stirred about with a stick to separate the grains.

Cooking Vessels.—Earthen vessels were always used; they are objectionable, because it is difficult to clean them, because a considerable portion of the rice sticks to their sides, and because they are so liable to fracture, and are so awkward to move. I have frequently seen a heavy pot full of boiled rice smashed in the act of lifting it off the fire, and sometimes the bottom comes out from the mere weight of contents. I would advocate the use of degchis with handles, they should hold 38 measures of raw rice and seven gallons of water; two such pots and one containing six measures of dhall and 12 gallons of water would also be required for each gang of adults.

Issue of Cooked Rations.—At a quarter of an hour before the meal time a drum is beaten. The gangsmen should then go to the spaces assigned to their respective gangs in the feeding enclosures and call their rolls; as soon as they are assembled the] gangsmen will hand in to the campmaster their reports, the gangsmen will then go with some members of their gangs to fetch the eating utensils; these are bowls which will hold twelve ounces of rice when boiled, and half pint mugs, both made of tin; as soon as these are distributed the second drum is beaten, then the cooks of each gang bring out their rations, which they distribute; they are furnished with tin measures which hold respectively the rations of rice and condiment soup. The rice is carried in a large open basket by one or two of the gang and the male cook serves it out; the condiment soup is ladled out by the female; care must be taken to see that the dholl is not allowed to drop to the bottom, which it will do if not bruised into flour: the recipients prefer it separated from the condiment soup, as they can see what they get; but the most wholesome mode of giving it is, after it is boiled soft, to grind it into a paste and then put it into the condiment water to make a pea soup. As the rations are given out to the gangs by their own cooks, the responsibility is limited to them, and should any deficit exist it is at once made good by a minor indent on the store-keeper, and the cost is recovered from the pay of the cooks; the gangsmen should supervise the issue of each ration, and it is their duty to report at once any deficiency. The only way of securing to the children their full ration is to feed them apart from adults, which was always done.

Eating Utensils.—The use of tin eating-vessels is very desirable. It is impossible to cleanse earthen ones, and they are constantly broken. Inmates should not be allowed to keep their own eating utensils; they never wash them, and the smell, besides being unpleasant, attracts swarms of flies; the putrid matter in them renders the fresh food unwholesome, and it is a common sight to see the end of a dirty body-rag doing service for a plate. The only difficulty about the use of tin vessels consists in the certainty of their being stolen, unless great precaution is taken. They should be supplied to gangs on the indent of the gangsmen countersigned by the master; when any member of his gang leaves he should return them into store, getting a receipt for them, those that are in use will be in the charge of the gang servants; after the evening meal, they will be placed by them in a shed set apart for their reception and for that of the gangs' cooking pots; this shed will be locked by the store-keeper and be under police guard at night; for the eating vessels of each gang, strong bamboo baskets should be provided into which they should be placed; if any vessel is missing at meal time the gangsman will report to the master; after each meal he will personally see that the gang-cooks get back the proper number.

Warm Clothing.—Cumblies or blankets should be given to hospital patients at the discretion of the medical officer; as a rule, very few of the inmates are accustomed to any other clothing than their cloths; gunny or rice-bags make very good bedding, but in the ordinary poorhouse the dry floor of the hut is sufficiently comfortable, and is what the majority have laid on all their lives; but inmates on arrival generally come half naked; their rags should be taken from them and burnt and a cloth given. A very serviceable woman's cloth can be obtained for 14 annas to 1 rupee, and a man's cloth for 1 rupee; each cloth must be marked with the "broad arrow" or they will be stolen. When an inmate is discharged from camp, this cloth should be taken from him, washed and kept for issue to a new arrival, and an unmarked one should be given to the out-goer. This account should be kept by the master.

Hours of Rising, Feeding, &c.—The rouse should be sounded at 5 a.m.; all inmates in the ordinary camp and in the convalescent ward will then be turned out to the latrines by the warders on duty; when they vacate these, they will be escorted by the warders coming on duty and a police constable to the place set apart for ablution; at 8 a.m. they should return to the feeding enclosure; at 8.45 the first drum is beat, they then fall in by gangs as already described; after breakfast the labor gangs fall in under a warder and constable and go to

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work; the sweepers sweep up the camp enclosure; the water-carriers fill up the filters and supply the cook-room; those gangs whose turn it is to wash clothing go under a warder to the place set apart for this purpose; all inmates should return at 4 p.m.; at 4·30 p.m. first drum for evening meal is beaten, after this meal the enclosure is swept up; at 6 p.m. the inmates fall in by gangs for roll-call, and they are then turned into the sleeping quarters.

N.B.—Cloths need only be washed once a week; this should be done by gangs.

Sickness.—As before explained the warders on duty should find out and report all cases of sickness to the master; a couple of blanket doolies should be ready at his quarters. In ordinary cases of sickness some of the inmates should be made to carry the sickpers on if unable to walk; but in cases of cholera they will not approach the patient, and it will be necessary to send for the hospital dooly-bearers or vettayan.

Work on which inmates can be employed.—This will, of course, be of a very mild description; as already stated, they can be employed on supply of water, sweeping enclosures, repair of fences and huts; the only outside labor is cleaning out drinking wells or breaking metal; but this latter is a costly amusement if the stones have to be brought from any distance, because I would not allow the gangs to go far from the poor-house, otherwise they will certainly desert, because the guard that can be supplied is not strong enough to prevent them, and if they are seen working under strong guards like prisoners the effect on outsiders is very bad and not calculated to encourage an hesitating applicant.

Registers and Returns.—General register of admissions.

Register of admissions into hospital.

Account of receipt and issue of stores on indents to be kept for ordinary and hospital portions.

Nominal rolls of inmates.

Contingent accounts of store-keepers.

Daily state.

Eating utensils.

Cloth account.

N.B.—There are several minor forms, to describe which here is needless.

Difference between a poor-house and relief-camp hospital.—The main difference is this, that in a relief-camp hospital there should not be any cases of emaciation or of chronic sickness. The only diseases in it should be those which arise on the work and require prompt and short treatment; further, the medical officer in a relief-camp would be responsible for its general sanitation.

QUESTION 28.—POOR-HOUSE HOSPITAL ARRANGEMENTS.

Ch. III. Qn.

Refer to the questions regarding a hospital attached to a relief-work, and consider how far the arrangements suitable for such an establishment would also be applicable to a hospital attached to a poor-house. If any difference of system seems desirable, state in detail what seems requisite.

Replies not summarised.

Punjab and North-Western Provinces.—Hospital accommodation should be provided for 20 per cent. of the inmates of a poor-house. Particulars given.

Bengal.—The poor-house hospital may be under the same rules as that on a relief-work.

Bombay.—No difference of system is recommended.

NORTH-WESTERN PROVINCES.

North-Wester

Province

Dr. Hilson.—Every poor-house containing upwards of 200 inmates ought to have a hospital of its own, because about 20 per cent. are likely to be sick or to require medical assistance in one form or other.

If the poor-house is intended to contain less than 200 inmates it ought to be built, if possible, near a dispensary, so that the hospital assistant could attend to the sick in addition to his other duties.

The sick can then be treated in the poor-house, one portion of which should be set apart for them.

When the inmates exceed 200, a hospital assistant with a competent staff of compounders and dressers should be appointed to take charge of the sick.

An ordinary hut, such as has been already described, forms a sufficiently good hospital; but in summer it should have walls on each side made of sirki, with a space of about one foot left open at the top, to ensure free ventilation.

In winter grass mats plastered with mud should be substituted for the sirki. Each patient should have at least 40 superficial feet if possible, and not more than 20 patients should be accommodated in one hospital hut.

It would probably cause too much expenditure if each patient on admission were provided with new clothes, although such a step would contribute greatly to the cleanliness of the hospital and the comfort of the patients; but care should be taken that the clothes which the paupers bring with them are washed when dirty and renewed when much torn. Every patient ought to have one blanket in summer and two in winter, and a supply of dhotis, saris, and blankets should always be available at the poor-house for use in the hospital.

It would manifestly be impossible to give a charpoy to each patient, but a few might be kept in the hospital for special cases.

The bedding should consist of straw or dry grass, and a large supply should always be available at the hospital to replace what becomes soiled by the discharges of the patients.

If the majority of the patients are of low caste, which is usually the case, Musalmans will be found the most suitable cooks to employ; but there ought to be one Brahman cook, or more according to circumstances, with a separate cooking-place for those who object to take food cooked in the general kitchen.

There ought to be one sweeper for every 25 patients in the hospital. If many diarrhœa cases are under treatment one sweeper to 20 patients will not be too many. Within 40 yards of each hospital there ought to be a latrine formed of grass or bamboo mats kept upright by wooden posts. These should enclose a space about 16 feet long by 10 broad. No trench should be dug in it, and the sweepers should remove by means of khurpas and phaurahs all excreta, and throw frequently on the ground some dry earth, a supply of which should be kept in the neighbourhood.

This is by far the best form of a latrine for a pauper hospital.

Every eight or ten days the latrine should be removed to an adjoining site, and if the earth on which it has stood be removed to the depth of six inches and replaced with fresh earth, no disagreeable odour will be emitted. The use of McDougal's disinfecting powder should be prohibited, because it conceals

NORTH-WESTERN PROVINCES.

objectionable smells, and consequently their source may escape observation.

Gumlas or shallow earthen pans, into which loose earth has been cast, should be placed on each side of the huts at intervals of three or four paces and distant about 8 feet from the hut. These can be used by patients who are unable to go to the latrine.

The ground in the neighbourhood of these gumlas must be removed periodically as it becomes foul.

There ought to be one bearer attendant to nurse every 20 patients.

Care should be taken that these attendants are all strong healthy men, that they have no caste prejudices, and that they are not the servants or protéges of the native doctor or other official.

It is their duty to feed the very week and emaciated, to see that the patients are kept covered with a blanket, and to lift them and assist them to reach the gumlas when they wish to resort to them, &c., &c.

Bhistis should be provided in the proportion of one to every 80 patients, or according to circumstances; a few of them ought to be Kahárs; and every patient ought to have a small earthen drinking cup.

It should be borne in mind in estimating the number of the bhistis required that they have to supply water for the purpose of washing the dirty clothes of the patients.

Separate hospital huts should be erected for the reception of patients suffering from cholera or small-pox. These ought to be placed at a litttle distance from the others; but if they are placed too far off the patients run a chance of being neglected. Cholera in India is a very feeble (if at all) infectious disease, while small-pox is a disease of children, from which the great majority of the adult population in India has suffered. Both the cholera hospital and the small-pox hospital may be placed within the general hospital enclosure; the only precaution necessary is to appoint one of the attendants to prohibit children from going near the hut in which the small-pox patients are treated.

This end can also be attained by placing a *jaffrey* fence round the hut. A sweeper should also be appointed whose sole duty it is to bury the discharges of the cholera patients.

The civil surgeon will supervise the hospital assistant, and when there are several poor-houses in the district he ought to be assisted by an assistant surgeon especially appointed for the purpose.

The officer of the Public Works Department and the civil officer should interfere as seldom as possible with the medical arrangements, and it will usually be enough if they bring to the notice of the medical officer any dereliction of duty on the part of the hospital assistant.

Dr. Prentis.—Hospital accommodation should, considering the amount of sickness likely to occur in a poor-house, be provided, in my opinion, for 20 per cent. of its inmates. The hospital might consist of thatched sheds similar to the other sheds of the poor-house, only provided with grass tattis to keep out the cold and rain. As bowel complaints are always more or less prevalent in poor-houses in this district, it would be advisable to give to each patient a superficial area of 4 × 7 = 28 feet. Clothing and bedding should be issued at the discretion of the medical officer. Brahman cooks in the proportion of one cook to every 33 sick should be attached to the hospital, and the meals issued at least twice a day. A hospital assistant and compounder, water carriers and sweepers would also be required. The nursing might generally be done by some of the paupers. In addition to the ordinary hospital it would also be very desirable to have a shed at some distance from and to the leeward of the poor-house for the accommodation of patients suffering from epidemic disease, such as cholera or small-pox. The hospital assistant in charge and the hospital would of course be under the control and supervision of the civil surgeon.

Dr. Deane.—I would have both hospitals on exactly the same footing. The sheds should be made of sírki and be on raised chabutris as I described for the ordinary huts. I would, however, make a difference in the size. No hospital hut should be made for more than eight or ten patients: nearly all the cases are bowel complaints, and after a time (*with the very best management*) the stench is awful. The ground, too, gets polluted and it is absolutely necessary to change the sheds often to clean and dry them again. It is not often they will all be full, and you can change from one to another. No man who has not taken a personal interest in the matter knows how difficult it is to manage such people. They fight against taking medicine, eat any garbage they can get hold of, and will not take the trouble to use a proper vessel to relieve their bowels in, but soil their clothes and blankets as they lie. I never experienced a more heart-breaking task than trying to keep the hospital in order. If the sheds are made about 12 feet broad and have one side constantly open it will answer well. I have now some sheds erected in that way, and they make an admirable dry weather hospital, and a very fair cold rainy weather one.

BENGAL.

BENGAL.

Mr. Kirkwood.—I think the hospital arrangements contemplated in my reply to Question 14 would suffice in the case of a poor-house hospital. I would add that in either case, on application being made, a relative should be allowed to sit by and attend on a sick person, by special permission of the medical subordinate in charge. This relative would get no meals in the hospital. I would also note that in the case of poor-houses it will generally be necessary to have a couple of sheds apart from the main hospital for the treatment of cholera and small-pox cases. This would not, I think, be necessary in the case of the hospitals on the earthworks.

A native doctor should be in charge of the hospital if the poor-house contains 400 or more; otherwise, probably a dresser would suffice, subject to weekly (or more frequent) inspections by the native doctor of the circle.

The native doctor (or dresser) would have to keep up registers to submit therefrom weekly extracts to his superior medical officer, who should check, test and countersign, or object, and act in the manner set forth in my reply to Question 14. The native doctor would at the same time forward a copy of these weekly extracts to the civil officer in charge of the relief operations in that circle. The registers should be similar *mutatis mutandis* to registers A, B, and C which (in answer to Question 27) I have said should be kept up by the superintendent of the poor-house.

The grain received would be that handed over to the hospital by the poor-house superintendent.

The native doctor should have an advance of Rs. 50 from the civil office for miscellaneous food expenses.

In register (B) columns 3 and 4 would be admitted, and so would columns 11 and 12 in register (C).

The native doctor would submit his establishment bills (through his medical superior) to the Civil office precisely as the superintendent of the poor-house for his establishment.

BOMBAY.

Bombay.

Mr. Spry.—I think that whether a hospital be attached to a relief work or to a poor-house, exactly the same system should be carried on at both of them. There should be no difference after people are admitted into hospital. At the poor-house it will probably be possible to make the buildings of a more substantial character.

MADRAS.

Madras.

Dr. Lancaster.—With reference to a hospital in a poor-house, I am of opinion that the *whole* poor-house may be considered (from our experience of relief-camps at present) as practically a large hospital. The relief-camp may be called the "Taluk Hospital," for it is that practically. By far the large majority of inmates require treatment of some kind. Still there should be separate hospital sheds, into which all serious cases are to be treated. All slight cases may be treated as out-patients, these to live in what may be called convalescent sheds. The camp will thus be divided, as it were, into two large parts, viz.:—

(1) The hospital proper.

(2) The convalescent sheds.

The medical subordinate will treat the patients in hospital in the hospital sheds, the other patients (classified as out-patients) to be treated every morning, say at 8 o'clock, at the dispensary shed. These slight cases need not then be detained in hospital. All the inmates should be examined every morning; cases of dysentery and diarrhœa should be removed to the camp hospital.

The hospital sheds are best built with mud walls 3 feet high, and leaf roof. The eaves should project well over the wall to keep off the rain. There will be ample ventilation by perflation if this is done.

Refinements of sanitation are not required in relief-camps. The medical officer (Zillah surgeon) should be consulted in all sanitary matters. Non-professional officers are apt to have theories of their own regarding sanitation, and as these officers are often changed in the course of duty, these individual theories then affect the camp, and often detrimentally.

The floor of the hospital should be raised about a foot high; this keeps the inmates from the damp. Do not use cots of any kind; these become dirty soon, harbour vermin, require bedding, and are a nuisance in the long run. A mud pial answers well; he is accustomed to it; let it be cow-dunged regularly and kept clean.

Bedding.—A cumbly and a good gunny will be sufficient. These are easily washed and cleaned. As many of the inmates are admitted in mere rags, a cloth (common coarse one) should be given to each. With constitutions impaired and vital powers reduced to a minimum, these unfortunates cannot withstand the cold. One attendant to every twenty patients is sufficient. All of them will be under the control of the medical subordinate. The medical subordinate will be responsible to the officers in charge of the camp—the collector and the Zillah surgeon.

The medical subordinate must be ordered to follow recognised and standard modes of treatment in all cases. All dangerous and scarce drugs should be religiously avoided. When he is in doubt he should consult the nearest surgeon if possible. A large number of medicines may be bought on the spot from the nearest bazaar. Some of the indigenous drugs are extremely valuable.

He must have a small surgery to keep bottles, medicines, and stores; a shed 20 × 20 feet will be ample.

He must reside on the premises; it is a *sine quâ non.* An active, intelligent man is essentially necessary. If there is the slightest tendency to laziness or illness, the sooner he is removed from the camp the better. His returns must be regularly and punctually sent in.

The hospital kitchen must be, to a certain extent, separated from the ordinary camp one.

The hospital diet of the G.O. of the 24th September and that compiled by Surgeons-General G. Smith and Gordon are admirably suited to hospitals. Any change from those will only make the system too elaborate an one.

A shed for treating contagious and infectious diseases should be invariably erected (the number depending on requirements) well away on the lee of the camp. Ulcer cases should be treated in a separate ward.

The hospital should not be too large, the smaller the better. Long extensive sheds should be avoided. The cottage system is the best. Separate the hospital sheds from the camp proper by a hedge.

Conservancy of hospital.—A good staff of toties is essentially necessary, one to fifteen, twenty at least. Many of these inmates pass their stools involuntarily; these require constant attention; a little dry earth is to be sprinkled over each stool and carried away at once. All foul mats to be cleaned; if they cannot be cleaned they must be burnt.

Two or three vessels well tarred must be kept for night use in each shed in one corner with dry earth handy. These vessels must be removed in the morning.

A small latrine *must* be attached to each hospital shed. These may be built with tarred tatty work. They must be cleaned constantly; a stock of dry earth must be kept in each. If the smell is bad on these, the medical subordinate is apt to rush to the aid of disinfectants like Macdougall's powder, &c. *He should fine the toties instead.* If dry earth is properly used, there will be very little need of disinfectants, for there is no better disinfectant than dry earth.

The sheds should be cleaned out daily and fumigated by burning sulphur or coal-tar. The floors should be cow-dunged at least once in a week.

The patients, where practicable, should be allowed to sit out every morning in the sunshine. It has a tonic effect upon them.

The hospital attached to a relief-work should be a movable one. There need be no fence round it; a rough one would do. Severe cases of illness and chronic diseases should be transferred to a relief-camp hospital. All minor cases, wounds, and injuries, and trifling complaints may be treated in the hospital attached to the relief-works.

In the case here put no difference of system occurs to me as desirable.

I. III. Qn. 29.

Question 29.—Disposal of Convalescent Poor-house Inmates.

29. *What system would you pursue for drafting into a relief-work those inmates of a poor-house who recover strength and health there and become fit for labour?*

Punjab and North-Western Provinces.—Persons fit for work after examination by members of the committee should be sent to relief-works, in gangs of 20 to 25, in charge of mates.

Bengal.—Periodical inspection of inmates of poor-houses. Those fit for labour to be sent to a work in charge of a .

Bombay.—The civil and medical officers in charge should inspect the inmates daily and all new comers, and send the able-bodied to works in charge of muccadums.

Madras.—Twelve European gentlemen and 1 Native have replied.

It is generally recommended that the selection should be made by or under the advice of the medical officer, and that the ability of the selected drafts to work should be tested by giving them light labour about the camp before sending them to working gangs.

Punjab.

PUNJAB.

Mr. Nicholl.—Upon the report of a medical officer that certain of the inmates were fit to do ordinary labour, they should be despatched to the nearest relief-work in charge of a chaukidár, and informed that they will not be re-admitted into the poor-house.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—Such persons after being examined by two or more of the members of the poor-house committee were sent in gangs on to the relief works in charge of mates, one mate being appointed to each gang of 20 or 25 persons. As the gangs were able to reach the works the same day they left the poor-house, no advances were made them for diet money. They received the usual wage on arrival at the work.

Bengal.

BENGAL.

Mr. Toynbee.—I would have a periodical inspection by a thoroughly trustworthy officer of the inmates of the poor-house; if possible, I would associate with him a medical officer, the best available. All those who were found fit for labour I would send in charge of peons, or of a police, or some other guard, to the nearest relief works. I would, as far as possible, let them form themselves into gangs, under their own mates or *sirdárs*, and I would provide them with a cloth, food enough for the journey and for a day or two over. In the cold season I would give each a blanket. If certain poor-houses were periodically inspected on fixed dates, the officer in charge of the relief works would know when to expect the poor-house gangs, and would make arrangements to receive and hut them. Two or three days before the date of the periodical inspection, the officer in immediate charge of the poor-house could send the officer in charge of relief works an estimate of the number likely to be drafted out on to the works.

Mr. Kirkwood.—Any person belonging to a poor-house who becomes fit for earthwork, should, if there is earthwork available of a suitable kind, be sent there in charge of a peon. Generally three or four persons or more should thus be sent at a time. These persons should be accompanied by a challan, giving full particulars about them. They should have enough food given them for the journey. On arrival at the work the peon should hand them over with his challan to the overseer. The overseer will then take charge of these new-comers and will grant the peon a receipt for them. He will take that receipt back to the poor-house, and hand it to the superintendent, who should file it. If unable to do earthwork, but able to do spinning or weaving and not homeless, the person should be sent with a week's supply of food, *plus* the food necessary for the journey, to the cotton store nearest to his or her home, with a challan, in the same manner, and should thus be handed over to the cotton store-keeper. Whether sent to the cotton store or to earthwork if the person leaving the poor-house has not a fairly decent cloth for a covering, he should be provided with one before his departure. The cotton store-keeper, after advancing a supply of cotton, should forward the person by his peon, with a challan, to the head-man of the village in which the person's home is situated, who should give a receipt for the person, and should thenceforth keep an eye on him or her until well afloat. Similarly, those unable to do any work, but not homeless, should, when the house-to-house relief arrangements are complete, be sent to their homes from the poor-house with a challan in duplicate and food for a week, *plus* the food necessary for the journey. One challan should be delivered to the village head-man, the other to the officer entrusted with the distribution of house-to-house relief, so that he may speedily supply them with relief. All these despatches from the poor-house should be made under the authority and by the orders of an inspecting officer or of not fewer than two members of the relief committee. The registers (A.), (B.), and (C.) should, in the column of remarks, bear his or their endorsement as to the number of persons (men, women, children, &c. separately,) thus discharged, the manner of their disposal, and the amount of food or cash or clothes given to them on their departure, certifying that all this was done in his or their presence.

Ch. III. Qn. 29.

BOMBAY.

Bombay.

Mr. Hewlett.—At the midday inspection the medical officer would be able to select cases which should be drafted to a relief work and all new-comers should, as before recommended, be inspected to see whether any were fit to go at once to a relief work.

Mr. Norman.—Able-bodied persons who are pronounced fit for work should be drafted on to the works in small gangs under muccadums and karkuns, arrangements being made to feed them at certain fixed stations *en route.* No difficulty is experienced in carrying out this system.

Mr. Spry.—The civil officer, in conjunction with the medical one in charge of the hospital, should make periodical inspections, say, every two or three days, of all the people in the poor-house, and send to the relief work such as are fit for labour.

MADRAS.

Madras.

Mr. Crole.—I have found it expedient, before finally sending paupers out of camp to works, to keep them at light tasks of stone-breaking within the enclosure, or immediately in front of the camp, without pay for a week. They should be fed and otherwise treated in precisely the same way as other paupers. There are three reasons for this—

(*1st*) by gradually hardening the muscles it constitutes a good preparation;

(*2nd*) it enables the camp superintendent to correct in time any mistake which may have been made in the estimate formed of any pauper's health and strength;

(*3rd*) the paupers so drafted more willingly leave the camp where they have received food only in exchange for their labor, to go to the relief-works where they are paid in money.

Major Baynes.—The ordinary poor-house should be visited once a week by the inspecting officer in company with the medical officer for this purpose; they will select such persons as are considered capable of doing work, either on Class I. or II. or who should be put on gratuitous relief. Lists of these persons will be prepared in triplicate according to their classification and signed by the inspecting and medical officer; one copy will be filed by the master who will send the two others to the relief officer, who, in the case of persons discharged for labor, will forward a list to the engineer officer in charge of the works, and on receipt of detailed information from that officer as to the works on which he requires coolies, &c., the relief officer will issue detailed orders to the poor-house master as to the disposal of such coolies; every person thus sent to work is to be supplied with a labor ticket and marching batta if required. In the case of persons sent to their villages on money dole, the relief officer will give notice to the village inspectors, and on receipt of a report from them that they are prepared to carry on payments to them at once, the master will be instructed to despatch them, each person is to be provided with a ticket, and with also travelling batta if required. The best time to discharge persons from a poor-house is immediately after the morning meal.

MYSORE.

Mysore.

Mr. Ricketts.—Such poorhouse inmates as are here referred to should be passed out by the doctor and first sent to light work or special gang, and then as they went on improving they would be drafted after inspection into a stronger gang till ultimately they joined the able-bodied or A class.

QUESTION 30.—RELIEF OF PARDA-NASHIN OR GOSHA WOMEN.

Ch. III. Qn. 3

There are two classes who ordinarily receive gratuitous relief without being inmates of poor-houses. The first is parda-nashin or gosha women. What test can be applied to prove their necessity? Would you inquire into their cases through an official or a non-official? Supposing they have hitherto been dependent on a person who now refuses to support them, would you admit them to relief or require him to support them if he is able to do so, (1) *if they have close natural ties to him,* (2) *if they have not? Supposing the necessity of relieving them to be established, how would you relieve them, with money or food, or by giving work, such as cotton to spin or grain to grind? How often should this relief be given, and in what quantity? When, and under what circumstances, should this relief cease? Have cases occurred in which dependants of persons in easy circumstances have claimed or obtained relief, and how have such cases been dealt with?*

Punjab and North-Western Provinces.—Relief should be administered through respectable native gentlemen, official and non-official. Money and cotton to spin or grain to grind should be given out. Relatives of those who can support them should be compelled to do so.

Bengal.—Officials, such as patwaris, and Government ryots, may be utilized in the districts as municipal committees in towns; also planters. Cotton to spin may be supplied to purda-nishins.

Bombay.—A committee of native gentlemen should visit all parts of the city, and discover the deserving gosha women, who should be supplied with work, or free grants of grain if unable to work.

Madras.—Gosha women should be sought out by an official, some say by a female pensioner. A committee is not recommended. A money dole is preferred to giving work. Fraud is said to have been common.

PUNJAB.

Punjab.

Muhammad Hayat Khan.—It is quite necessary to support the pardahnashin women and the men quite unable to work, and attention to such persons would create good ideas in the minds of people. The pardahnashin women would seldom come to the relief works, and but few of them would really need assistance; but an inquiry of their necessities had better be made through non-official respectable men, or in

H.III. Qn. 30.

Punjab.

the case of there being none, it should be made through tahsíldárs and members of the Relief Committee, who would submit it to the civil officer. The men on whom they were previously dependent for their support could not be held responsible for it in famine times. There are two ways of relief for such women: (1), if they are able to work and know the work, cotton, wool or sewing work should be given them on daily wages, and those who are accustomed to grind should be employed on the same; (2), if they are old and unfit to work, they should receive gratuitous relief. The pargannah tahsíldárs, after full and satisfactory inquiries, should send a list of such women to the superior civil officer, who would send 8 or 15 days' food and work to such women to their homes through a respectable member of the Committee or tahsíldár, and the latter or any other officer should at least twice in a month go to the villages (presumably they would be few in number) where they live, and satisfy himself that the last supply was duly received by them, and the work done by them was duly received back. The lambardárs should have a register of such paupers, in which the patwári, under the attestation of the zaildar and lambardár, should enter the date of receipt of supply, its quantity, number of days for which it was supplied, and the amount of work done by them in the week, and officers would sign it at their inspection. The officer should satisfy himself, through other women, that the food supplied was duly received by such pardahnashins.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—The necessity will arise after famine prices have prevailed for some little time. Respectable native gentlemen, official and non-official, might inquire into their cases. Any person able to do so should be compelled to support all his dependants, whether they have or have not close natural ties to him. Unless magistrates are invested with some such powers they have no means of checking the lists of pardanashin women, which must be prepared by native gentlemen.

Mr. R. Wall.—I have known cotton distributed to purdanasheens to be spun, and as long as high rates were given, such as admitted of getting the work done in the bazaar for less and pocketing the difference, there was a wide spread of "purdanasheen" distress; but when the rates were reduced to the market price, and there was no profitable margin left, the mock distress among the purdanasheen class ceased! I believe their male relations made a good thing out of it while the high rates lasted. I believe something of the kind was done at Amroha, a Muhammadan town of some 30,000 inhabitants in the Moradabad District, North-Western Provinces, in 1869. It was managed through the meer-muhallas, and was, I believe, successful.

Mr. Story.—This is a most difficult matter to test. It can only be done by inviting the most respectable native gentlemen to become members of the relief committee. These gentlemen should be entrusted with the distribution of relief. Both officials and non-officials might work together. If the person they are dependent on has the means, but refuses to support them, and there are close natural ties between them, I would insist upon his supporting them. In my opinion, as far as my experience goes, there are few natives who would not support their female relations to the utmost of their power in times of difficulty. If the women have no one to depend on, or the person they depend on is too poor to do anything for them, then they must get relief. I would leave the matter of how they were to be relieved, and the seeing that work, where the recipients of the charity were capable of working, has been fully executed, all to the management of the native gentlemen. I think the relief should be given weekly, in money for spinning and in grain for grinding. Most of these women in ordinary times earn their livelihood in this manner, so that there need be no difficulty in ascertaining the quantity of labour they should do per diem. The money given should be sufficient for them to obtain daily 8 chittacks of flour and 2 pice for purchase of condiments. Stopping relief of this kind can only be judged by the rates of prices prevailing for the cheapest food staples. Probably when prices rise to 10 seers per rupee some relief of this kind will be necessary. Until that happens I do not think there is any necessity for relief; a case here and there may arise, but it will be exceptional.

Mr. Quinn.—The class of *pardanashins*, who require relief is not a large one, and is to be found almost exclusively in towns, more especially in old decayed towns. Their case can best be inquired into by non-official native gentlemen. At least I was satisfied with this mode, and do not think that they abused the large discretion necessarily left to them. A proper nominal register should be kept up, and should contain a brief account of the circumstances under which each person was admitted to relief. Those relieved should receive in advance a weekly dole of money. This is cheaper and less troublesome than giving daily rations. Those who can spin should be given to spin a certain amount of cotton, to be returned at the end of the week, but their allowance should not be fixed with reference to the value of their labour. I do not think that any test can be applied. I should certainly require the head of the family, if he had the means, to support those connected with him by close family ties. This is in accordance with the customs of the country, and would ordinarily be enforced by the *biradari* on pain of repudiation. I should not, however, go beyond this. A native of India is as much bound to support a deceased brother's widow and children as a native of England is to support his own wife and children.

Bengal.

BENGAL.

Colonel Burn.—The patwari and Jet ryot system, as already proposed, for the utterly helpless in the mofussil, and municipal commissioners in the towns. We found both systems answer in 1874. Natives who are in a position to allow their women to remain *purdah-nusheen* would seldom or never desert them at time of need. If they had to go far for work, they would, among themselves, organize some means of looking after the females and little children. I would give those women I *must* help cotton to spin; it would save their dignity, which is, I submit, desirable; self-respect should always be encouraged; and they would fancy they were doing something, and not be as such classes (except some Brahmins) abhor to become, the bare recipients of charity. We found no greed or covetousness in these classes in 1874, and no eagerness to take undue advantage of our charity.

Mr. Hodgkinson.—The question of village relief is perhaps the most difficult to answer satisfactorily in the whole range of the subject. *At Hutwah I was able to work through putwaries and resident tickadars immediately connected with the estate. A district officer has not the* same hold *on the former; and for* the latter an official element, which from want of local knowledge is not so efficient, has to be substituted. The course I would adopt in this district is as follows :—

When distress bids fair to ripen into a famine, after dividing the districts into circles, each under the supervision either of an official or some influential European or native gentleman, I should call upon the chowkeedars of each village, through the police, to deliver in within a given time at the thana a list of all persons in their villages who are without means of subsistence, but from being *purda nasheens* or bedridden are unable to present themselves for relief. The chowkeedars would be furnished with orders to the village putwari directing him to write and test this list before submission. These lists would be then sent to the circle officer for such inquiry regarding the persons named in them as he is able to make, either personally or with such agency as he has at his command. Residents holding large tracts in lease, like indigo-planters, who are very numerous in this district, have exceptional facilities for ascertaining the truth with a little trouble. To such of the *purda nasheen* women I would supply cotton to be twisted into thread, sufficient to afford a fair amount of employment for 15 days, and either 10 seers of grain or money sufficient to buy it. On the return of the thread a similar task and allowance would be sent. About 700 *purda nasheen* women thus obtained relief in the Hutwah subdivision in 1874. Similarly every 15 days a like allowance was sent to the incapable and bedridden poor. The main difficulty in distributing the allowances to the *purda nasheen* women and bedridden folk is the agency to be employed. I should, in this district, employ the chowkeedars or putwaries as might be most convenient under a somewhat strong supervising staff, and pay them extra for their labour. In hard times the chowkeedars sadly require help. No case came to my notice of relief being claimed by dependants of persons in easy circumstance, although I knew inquiry was made personally by the relief officer in a number of cases.

Mr. Toynbee.—As regards relief to *purda-nashin* women, the only test that can be applied to their case is local inquiry into the circumstances of the family in which they reside. If official agency were available, I would prefer it to non-official, as being less likely to lead to abuses; but in the absence of the former, I would accept the best non-official agency I could get. The less *local* this was, the less would be the fear of abuses. The village relief which was carried out in Pooree in 1867 met these cases in this way: Selected Deputy Collectors and relief inspectors visited (or were supposed to visit) every house in every village, and gave tickets entitling the holder to receive a certain quantity of rice weekly on a certain date from the nearest grain depôt. The quantity allowed was in accordance with the apparent necessities of the family and the number in it. No test could be applied: each case was left to the judgment and discretion of the officer concerned; and as far as my memory serves me, I cannot remember any flagrant cases of want of judgment. But it is in my opinion a dangerous method of relief, and only applicable in extreme cases. If introduced, it should be introduced rather as a measure of alleviation than of prevention, its object being to help not those who were helpless from the first, but those who had hitherto helped themselves and tided over the famine as long as their resources could stand the strain. It is only when these private means have been exhausted that the State should give aid.

A requisition on the head of a family to support such persons would have little effect, unless the refusal of it entailed a distinct penalty. To impose this, legislation would be necessary. All that the relief officer could say would be—"Your circumstances appear to " me, after local inquiry, to be such that you cannot " fairly ask for any extraneous aid, and none will be " given you."

If relief be considered necessary, the best form of it would of course be to give cotton to spin, but this is a form of relief hardly applicable to *purda-nashin* women of the better classes; next to that to give a weekly dole of grain payable on a ticket to be given by the relief officer. This would presume the existence of Government grain depôts. In their absence money would be given, and perhaps one payment would suffice, calculated on the amount required to tide over the remaining period of scarcity. Relief to *purda-nashin* women should, generally speaking, cease as soon as the country has begun to recover itself and a good harvest has been reaped. It would be advisable for the relief officer, who issued the relief tickets in the first instance, to make a final visitation and inquiry. He would recall all the tickets originally issued, and would, in cases when relief was still necessary, give a ticket for a final and definite measure of relief, such as was suited, in his judgment, to the circumstances of each individual case—to one family a maund of rice (if Government stocks were plentiful and the demand to purchase them slight); to another a sum of money. As far as I remember, several cases occurred in Pooree where persons in comparatively easy circumstances obtained relief by ticket. On the visit of a relieving officer to a village, many devices were resorted to to deceive him as to the actual circumstances of families, and he was in many cases regularly mobbed by applicants. It was a most difficult task, and all that could be said was that, in cases where tickets were wrongly given, an error of judgment was committed. The only punishment was cancelment of the ticket.

Mr. Kirkwood.—Both (1) the purdanashin or gosha women and (2) the sick, infirm, cripples, and bedridden folk who cannot leave their homes should be sought out by the same agency and be relieved in the same manner. Many others not falling within these classes, but who ought to be relieved at their homes, should be sought out and relieved in a similar manner. Therefore I will answer Questions 30 and 31 together.

Where village agency does not exist, it should be created; and where it does exist, it should be utilized, improved, and supplemented. In either case the organization of the establishment for this relief should be one of the earliest measures taken when it is known that severe distress is impending. I would say,—sustain in their villages all those destitute and needy persons who can be so sustained, and collect into poor houses or hospitals only those homeless or ailing persons who cannot be so sustained. Let them be sustained by earthwork if they can perform it and there is some suitable work in the neighbourhood; let them be sustained by the cotton relief where earthwork labour is not suitable; let those who cannot wholly thus support themselves and their infant children be aided by a small monthly gift of cash or grain; let those who cannot thus in any way contribute to their own support receive a monthly gift of cash or grain sufficient for their maintenance. The case of those supporting themselves by earthwork or spinning or weaving has already been considered when dealing with those reliefs. I will not here repeat what I have there stated. As to the house-to-house relief, even when wholly gratuitous, it is very much more economical than poor-house relief, not indeed averaging one-third of the cost per person relieved. It is infinitely more acceptable to the relieved, and meets the case of very many, not only purdanashins, who would rather die or, at all events, sink into the lowest state of emaciation than frequent the poor-houses.

In 1867 this system of house-to-house relief was essayed in Orissa, though late, yet with great good. In Behar it was commenced upon earlier and did much good; but we were even there (at least so far as Bhagalpore was concerned) only at the end of April finishing the preparation of registers which should have been well-nigh complete three months earlier. In the

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recent Southern India famine of 1877 the delay appears to have been much greater, while, owing to prices having been allowed to rise much higher than was the case in Behar, the famine was much more severe. The consequences of the delay thus became far more lamentable. Look, for instance, at the state of things in Mysore, as described by the Government of India on the 30th October 1877.

When anything like a three-quarter failure of the crop over a considerable area is assured, preparations for this relief should commence even before the harvest is reaped. By this means all should be in readiness by the time when the temporary lull occasioned by the scanty harvest is over. The first step towards preparation should be the appointment of fit persons to inspect every village, and draw up lists of the needy, stating for each person whether they should go on to earthwork or on to spinning or weaving relief, or should be relieved gratuitously, and, if gratuitously, the amount of monthly dole which should be given, and from what date it should begin. In Bhagalpore this preliminary operation was not commenced until the middle of March, long before which date it should have been completed. The monthly distributions should have already commenced. The consequence was that there was no time for a selection of the most fit persons available for inspectors for this purpose, distress had got ahead of us, and incomplete registers and an absence of method and regularity signalized the first distribution of April. November should have seen the village inspectors at work, and January should have found the superior relief officials going round checking and revising the registers thus compiled. Before discussing the establishment necessary for making this inspection I would pause for a moment to remark that in Bhagalpore district, I, with then 10 years' service, was placed in charge of the relief operations in the part of the district lying north of the Ganges, with a population of 960,000 persons. I was in semi-independent charge of the relief operations, working under the Collector's orders as regards general policy and reporting regularly to him, but being left to myself as regards detailed arrangements. Under me were eight officers who were either Assistant or Deputy Collectors or of similar position. Each of these officers had a separate charge, each charge being approximately one-eighth of the whole area. All relief operations in that area were under their control. They submitted regular reports and returns to me, and were guided in all matters by my instructions. One was an Assistant Collector, four were native Deputy Collectors, one was a police officer, two were European gentlemen not in Government employ, but engaged for the occasion on a pay of Rs. 200 per mensem. I think it would always be well to have some of these officers natives and some Europeans, and all (if possible) in Government employ. The natives and Europeans would stimulate and improve each other's action, the European learning from the native to be sympathetic and patient with prejudice, the native having in the European an example to keep him up to the mark in method and energy. I was constantly on the move over the whole area, and also had a head-quarters establishment at a central locality for the purpose of checking the returns, compiling statements, passing establishment bills, doing correspondence work, &c.

For the purpose of this house-to-house inspection and relief each of the eight circle officers had under him a certain number of "group superintendents" and an "assistant superintendent." The group superintendent was generally, I think, on a pay of about Rs. 10 per mensem. He was in charge of a group of about eight or 10 villages, and was responsible that no one in those villages died. He was generally a village putwari or accountant; a man who had lived in one of the villages in the group all his life, and, as a servant of the Zemindar, had considerable local knowledge and position. The group superintendents were required to draw up registers showing the names and circumstances of each person in the group either now requiring or likely shortly to require relief, and the manner and amount of relief which would be appropriate. The assistant superintendent (a trustworthy native official on Rs. 80 to Rs. 100, according to the importance of his charge) would go all through the circle to which he might be attached, check and revise those registers in the village, actually visiting the people's houses and seeing for himself their condition. He should enter against each person's name the manner in which relief should be afforded and (when to be relieved gratuitously on the house-to-house system) the amount of relief to be given. Whenever the allowance recommended to be given may be especially large or small, he should note the reason therefor against the person's name. When the assistant superintendent may have finished his check of several groups, the officer in charge of the circle should start on a round of the villages whose registers may have been thus completed. The registers should remain in the custody of the group superintendent. The circle officer would then revise the registers after personal inspection. The register for each village should run thus :—(1) consecutive number ; (2) name; (3) caste; (4) age; (5) father's name (or when a married woman husband's name; if husband dead, then "widow" should be entered); (6) what property possessed of; (7) number in family, and in the case of a widow, with whom she lives; (8) description of relief recommended; (9) if house-to-house gratuitous relief is recommended, amount of dole to be given ; (10) group superintendent's remarks; (11) assistant superintendent's remarks; (12) circle officer's remarks.

BOMBAY.

BOMBAY.

Mr. Spry.—At Bijapur, where there are large numbers of gosha women, the plan that I adopted and which I would adopt again, was to have a sub-committee composed of a European officer as president, and a certain number of respectable native gentlemen selected from each sect. The duty of these native members was to visit all the places in the city and to find out all deserving cases of indigent gosha women, also whether or no they were able to do any description of work. All these cases were reported to the committee when sitting, and then grants used to be made. Free grants of grain, &c. to those who could do no work ; but to those who could, a certain amount of grain to grind or of cotton to spin was daily sent, in consideration for which they received food grants also. The only test of necessity or check that could be applied was that the visiting members were of different and often of opposing sects, so that when the grants were publicly made, if any attempt at imposition had been made, it would probably be brought to light.

If a man, able to support his wife and children, failed to do so, and persisted in so doing, the law can be brought into force against him. But with other dependents, if the man will not support them, he cannot be made to.

The quantity of grain given was exactly the same as that given in a cooked state to the inmates of the poor-house, only it was uncooked and it should be given daily. This description of relief would cease simultaneously with other descriptions.

I have come across cases in which the dependents of persons in easy circumstances have sought relief; but a public representation to that effect to the person has invariably answered.

All sick and decrepits that I possibly could, I would bring to a relief-house. If they could not walk, I would bring them on carts or on bullocks. But even then a certain few cannot be moved. The village officers find these out by house-to-house visitation and make a register of them, which register is frequently tested by the circle inspector and other famine officers. They are then relieved through the agency of the village officers. If arrangements can be made for giving them cooked food, all the better; otherwise uncooked food must be given. This species of relief will stop simultaneously with that in relief-houses.

MADRAS.

Madras.

Mr. Longley.—The most suitable test is strict and searching inquiry, by house-to-house visitation, either through a combined official and non-official agency supervised by an European officer. When the number of gosha females is large a female East Indian Government pensioner well acquainted with the habits and customs and language of these females is about the best person to entrust this work to; a salary should be allowed her and the list of females submitted by her should be subjected to a strict and searching test by the best means available, *e.g.*, the priest or other influential member of the Mahomedan community, tahsildar, municipal commissioner, or other local influential individuals.

Gosha females who have close natural ties to a person on whom they are dependent, and who has means, should not receive State aid. He is bound by the law of his religion to support them. Females who have no such relatives, or having such, but without means, should receive State aid.

They should be relieved by a money-dole. Giving food or work (besides necessitating labor and expense) is unsatisfactory.

The dole should be paid weekly, and should not be less than the value of 1 lb. of grain daily.

The relief should cease when prices have fallen, labor is procurable, and distress disappearing.

Cases of this kind have occurred, and, when discovered, aid has ceased.

Mr. Price.—I consider the relief of gosha females to be a very difficult matter. Inquiries regarding them through men are not satisfactory. They can obtain information regarding the women's belongings, but can rarely see the subjects themselves. I prefer the agency of a respectable Eurasian woman, who can make inquiries and see claimants. I would have the first-mentioned inquiries made through officials upon whom one has some hold. I have already given my experiences in regard to the aid obtained from a non-official. I would not admit gosha women to relief where their natural protectors were able to support them, but refused to do so. I think where a man turns adrift, in times of famine, a person who has no claims of near kindred upon him for maintenance, but whom he could, if he wished, support, *e.g.*, (as was frequently the case) his mistress, he cannot fairly be called upon to maintain her. The woman would, in all probability, have been just as incapable of supporting herself if she had never been the man's paramour. I would admit the latter class, but not the former. I prefer relieving in money. There are very great difficulties in distributing food. Work, such as spinning, &c., might be given; but I think that the trouble and the staff necessary for distribution, collection, and supervision would be so great as to render relief in this form almost, if not quite, as expensive as giving money. Once or twice a week is a sufficient interval at which to make payments. We allowed the same sum per diem as that fixed by Government for village relief, *i.e.*, the price of 1 lb. of grain, and half to children under twelve. I think that it would be proper to make this allowance the value of the ordinary ration of a relief-camp. I should put a stop, and did, to gosha relief when village relief ceased. It is difficult to determine the exact period at which this latter should terminate. One has to judge by a number of concomitant circumstances which cannot easily be put down on paper. I know of no instance in which gosha women who were dependents of persons in easy circumstances obtained relief. Claims were made, but they were, on inquiry and inspection by our agent and on her report, rejected.

Mr. Austin.—The system of committees for distributing Government relief to gosha women was fully tried in the town of Vellore (having a Mussulman population of about 10,000), and proved an utter failure. The committee was composed of the leading Mussulman gentlemen of the place, many of them descendants of, and nearly connected with, the families of Hyder Ali and Tippu Sahib. It might have been reasonably expected that such persons would have shown at least some common honesty, but the result proved the contrary, and at last frauds became the rule and not the exception, when, with the consent of the collector, I abolished the committee, and did away with their swindle of gosha relief.

I think the only possible way of giving relief to this class without being defrauded at every turn would be to insist on residence in camps specially selected for gosha females, and entirely under female management. They would not of course come into such camps until the only option left them was the camp or starvation. Then I believe they would make a virtue of necessity and come in readily enough. Once the ice was broken there would be no further difficulty. It would be practically impossible to attempt to make Mussulmans support their relations. In the case of a wife or child neglected by husband or parent the law may step in. In other cases I do not see how we could interfere. The question would arise what relatives is a man bound to support, down to what degree of relationship, and how many of them. Lastly, how are we to ascertain the relationship? The very fact of their being gosha prevents our getting at this. On one point I am clear, viz., that whatever inquiries are to be made should be made by Government officials, who can be held responsible for giving correct information. When in camp some light work might be found for them.

When inquiring into the action of the gosha committee of Vellore, the conclusion I arrived at was that *by far the greater portion* of the money granted by Government for gosha relief went into the hands of the dependents of well-to-do Mussulmans, most of them not even being gosha. I am informed that much the same sort of thing went on in the town of Old Arcot, where there was also a gosha relief committee. This committee too was done away with.

Mr. Oldham.—*Purdanashin or gosha women.*—I know of no fixed test for ascertaining the necessity of these people. Last year inquiries used to be made through a trustworthy Mahomedan subordinate (there are no Hindu gosha women in Adoni), who often admitted that he had been deceived. He was never badly deceived; that is, the persons were always necessitous and pinched to some degree. If the person who used to support women in this position was still able to do so, I used to require him to continue to do so. There were not many instances of this. Very slight pressure sufficed. Before the Madras Government ordered the money-dole I used to give these people a monthly dole of dry grain (the maximum was 15 seers), and require them to spin for it. Afterwards I required them to spin for the money-dole. Many refused to spin and I used the requisition as a test and adhered to it, though told that it operated with great hardship. I frequently investigated cases

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Madras.

of death reported to have occurred in this class from want of food, and I never found one established.

But in Orissa, in 1867, I have seen the skeletons of such women lying in their houses, some with their ornaments still on their bones. Relief to them would cease with the general contraction of operations and for the same reasons. I never found any difficulty in closing it. On the contrary this class has invariably been most grateful, and recognised the reasons for its cessation themselves. I have frequently spoken to the members of it through the curtain. There are a good many at Adoni.

A few, two or three, cases occurred in which dependents of persons who, if not in easy circumstances, yet were able to support them, obtained relief. It was done through those persons. The recipients were of course struck off the relief lists on discovery. In one case the person who obtained relief for them was convicted and fined for cheating; in the others held up to opprobrium. The class is a sensitive one.

Rev. Bishop Caldwell.—I do not think it desirable that Government should undertake the relief of so-called gosha women. As a rule I do not believe in the existence of gosha women in this part of India. Where they exist and suffer real distress their relief may safely be left to the help of friends. If they are really people of that class, they belong to influential families and can make their voices heard, and when they do so private help will not fail to reach them. This is a department of charity in which Government will find itself utterly unable to provide against abuse.

Mysore.

MYSORE.

Mr. Ricketts.—One test would be to insist upon seeing the gosha woman; but from my experience I should say this was neither considerate nor proper. The best test is her willingness to work. If the official were a Mahomedan, I would inquire through him, otherwise through the cazee or other respectable Mahomedan. In the cases of refusal here put I do not see how the person could be compelled to support them. I know of a recent instance where a Mahomedan woman and her three children were refused to be put on the grain dole, because the husband was supposed to be able to support them, and the consequence was nearly being the death of the woman and her children through starvation. In the majority of cases I would relieve them by giving them cotton to spin or grain to grind. Relief should at first be given daily, and the period gradually extended to once in two days, once in three days, and so on, but not to exceed a week. The quantity should be the same as that given to an ordinary inmate of a poorhouse. The relief would cease with the necessity for relief, *i.e.*, when the famine was declining or fairly over. I have heard of cases in which dependents of persons in easy circumstances have obtained relief. In such cases the influence of the district officer should be brought to bear to prevent a repetition of such abuse.

III. Qn. 31.

QUESTION 31.—VILLAGE RELIEF OF SICK OR INFIRM.

Another class consists of the sick, infirm, cripples, and bedridden folk, in towns or villages, who cannot leave their homes. How would you organise a system for relieving them? How inquire into and ascertain their cases? How convey relief to them when they are put on the registers, and what relief should it be? When should relief of this kind be closed?

Punjab.—The bedridden in villages to be relieved by same means as purdah-nishins.

North-Western Provinces.—If relief is given it should be on a village circuit system. Zemindars should relieve those in need in their villages and punchagets those in towns. But many officers hold that there should be little or no relief in villages, and that the needy should be brought to poor-houses.

Bengal and Bombay.—Such persons should be relieved by house-to-house visitation under the village circle system of village officers and inspectors.

Madras.—A system of inspection by superior or subordinate officials is recommended, the latter to visit each village at least once a week. The relief to be by money dole on responsibility of the village officials. Strong opinions are expressed as to the dishonesty of these officials.

Punjab.

PUNJAB.

Mr. Nicholl.—For the bedridden and others who cannot leave their homes I would adopt the same system as for pardánashins, and in addition to the agency above suggested, Hakíms would be available either to furnish information or to convey relief, which should be in the form of food, and in quality according to the condition of the recipient.

This relief should be stopped on the cessation of operations, or, in the case of the sick, on their recovery.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Tracy.—The sick, infirm, cripples, and bedridden folk who could not be carried to poor-houses would be very few. I would not relieve them at their homes, if they could possibly be conveyed to a poor-house. If they could be conveyed, and were willing, I would have them carried at Government expense. Those who could not be so conveyed I would relieve as follows:—A list of such persons should be prepared by the police and tested by a European officer and native doctor. Then, in each village where such persons really existed, a man might be chosen to receive the money on their behalf. He should have to visit the tahsíl once a week and draw the allowance. These cases should be tested by a European officer occasionally. Relief of this kind could not be closed until the paupers' relatives were in a position to support them. This would usually be when the price of food falls to about 16 seers per rupee.

Mr. Lawrence.—I think there should be a division of the country similar to the parish system at home, each division being responsible for the support of the poor belonging to it. The unit for the rural portion should be the *patwári's circle*. The patwári should be made the registrar of births and deaths, and should have an accurate census of his circle. The landowners should be made responsible by law for the support of the poor belonging to their circle. They should also be responsible for supporting the labourers of their circle. In case of dispute the Government officer hereafter mentioned would decide as to what works should be undertaken and in what order. The theory of the land revenue assessment, that as in a good year Government does not ask more than the fixed revenue, so in a bad year the Zemindar should not pay less, is not adapted to this country. Money burns a hole in the pockets of most natives.

The parish system could be worked by pancháyats in small towns and by municipalities in larger towns. Of course, in times of dearth supervision should be exercised by specially appointed Government officials to see that relief is actually given, and it would rest with these officials to decide when this relief should be closed.

Mr. Quinn.—For this purpose I should break the district up into circles, over each of which I should put a committee of resident native gentlemen. I should oblige chaukidars to report to the committee all cases of distress. The tahsíldar, or some official of not less rank, should periodically inspect these circles. The form of relief would be an order on the village baniya for a certain daily ration. The baniya should submit his accounts weekly, and these should be attested by the patwári. Relief of this sort should cease as soon as grain ceased to sell at famine prices. Any who still required relief should then be transferred to the tahsíli poor-house.

Mr. Lumsden.—I would not attempt relieving such cases, except as a *temporary* measure, at every village in which they were met with; such cases should be removed to poor-houses or hospitals established at convenient centres. I have already stated that I do not consider it possible for Government to undertake the relief of persons suffering from privation at their homes scattered all over the country. Arrangements should be made, however, for all cases of the nature referred to in this question being brought to notice for temporary relief being given, and for their being forwarded as soon as possible to the nearest poor-house or relief camp. Unless the pressure of distress was very severe, I think the rural and station police, village patwáris, kanúngos, and peshkars would be able to see that all cases of this nature were brought to light. Kanúngos and peshkars would of course have to be relieved of all their ordinary duties. This is an essential point in my opinion. When our regular establishments are specially engaged on famine duty the performance of all ordinary duties should be dispensed with.

In *extraordinary* cases it might be necessary to call in the services of a special establishment to secure all cases of the nature contemplated by this question being promptly brought to notice. In that case I would suspend the operation of certain departments, such as education, vaccination, traffic registration, and utilize the employés of these departments on this duty. The services of retired or pensioned servants of Governments might also be called in, and local Governments or Administrations whose territories were exempt from famine should in such cases be called on to assist in supplying establishments.

BENGAL.

Mr. Toynbee.—I would apply the same agency and the same principles to the relief of the class mentioned in Question 31 as those indicated in the answer to Question 30. Given a trustworthy agency, the only method to be pursued is for the receiving officer to make a house-to-house visitation, and to deal with each individual case according to his own judgment. The organisation of a village in Bengal is so complicated, and the circumstances of different districts vary so much, that it would be impossible to draw up rules which would meet every case, or every class of cases; and there is this objection to these forms of relief that they require an amount of trustworthy agency which is seldom or never available and tend to demoralise the people if given too liberally.

Mr. Finucane.—These classes were relieved by gratuitous weekly doles of Government grain. Their cases were inquired into by the local sub-committees described in the answer to Question No. 9, Chapter II. The lists made out by the sub-committees were afterwards tested by paid relief inspectors who went round and visited every village. Such of these persons as were able to do so, came to the relief centres for their weekly doles. Grain was sent by the sub-committees to such as were not able to come for it. Relief of this kind cannot be safely closed till the harvesting of the winter rice crop succeeding that of serious failure.

Mr. Kisch.—I would give village relief only to the bedridden and to those who are infirm through old age. I would not give village relief to the blind, to lepers, or to cripples. Professional beggars generally get some relief from the public even when famine is at its worst. I would insist on their going to a closed poor-house if they wish for Government aid. I would also insist on the sick going to a poor-house till they recover. The cases of the bedridden and infirm should be inquired into at their houses. They should receive a daily allowance—in villages through the village authorities, and in large towns through paid officials. The relief should be—

To an adult, sufficient to purchase 1$\frac{1}{2}$ lb. of grain.
To a child (above 12 years) sufficient to purchase $\frac{3}{4}$ lb. of grain.

When village relief to *gosha* women and to the infirm and bedridden is closed, a gratuity sufficient to enable the recipient to hold out for a month should be granted. I cannot lay down any very definite rule as to when village relief should be closed. There is, however, no difficulty in deciding the point in practice. The moment the end of a famine approaches, labourers leave the works in large numbers, the inmates of poor-houses pray to be allowed to go home, and there is an entire change in the appearance of the people. Confining village relief as I would confine it to *gosha* women, the aged, infirm, and bedridden, there is no need to close it hastily. It should be continued till prices have fallen to at least what they were when relief operations were first considered necessary. For any system of out-door relief, whether the relief is actually given by officials in towns or by the village authorities in villages, the most frequent and thorough supervision is necessary, to prevent both Government and the people from being defrauded. I am satisfied that village relief cannot be substituted generally for relief in closed poor-houses without the greatest abuses prevailing; a sufficiently large and trustworthy inspecting and supervising agency is not procurable in India.

BOMBAY.

Mr. Hewlett.—The class mentioned in this paragraph can only, in my opinion, be found out and relieved by a regular house-to-house visitation, which should be undertaken by members of the committee,—Mahomedans to visit Mahomedan families, Hindus to visit Hindu families. I think cooked food is the best form of relief for them, and their willingness to take it is the best test for their requiring relief.

Colonel Anderson.—Relief in villages is open to much fraud. If a famine was prolonged I would bring all persons who could be moved to a relief-house, and thus reduce the numbers on village relief to the utmost, relieving none in their homes, except as a most temporary measure, who could possibly be brought to a relief-house. The circle inspectors should as far as possible see that all persons requiring relief are sent to the central relief-house, giving such temporary relief as may be necessary; but this branch of their duties will require to be most carefully controlled to prevent fraud and waste.

Mr. Bosanquet.—Persons of this description here were fed in villages by the village officers. The patel was responsible for bringing all such persons to notice, and the inspectors were also expected to visit from house to house in order to find them out. My assistants also sometimes visited each house for the same purpose. A register of these persons was kept at each village. In this part of the relief arrangements no difficulty was experienced. When circumstances are improving, if any such people remain, it is probable they will readily get assistance from their relatives or fellow villagers the same as in ordinary times.

Mr. Spry.—We had a system of village dole, but we stopped it towards the end of the famine, because we found that those who deserved relief got cheated by the patels, while others got relief who ought not. It would be impossible to supervise village relief without a whole army of officers in a large district. There are some very good men, patels and kulkarnis, but the majority are not so. We did trust the patels a good deal. Each patel had 5 rupees entrusted to him, with which to relieve all stragglers and villagers in bad condition, and to send them to the relief-houses. If this had not been done, the patels, if only told they would be reimbursed afterwards for any expenditure, would have done nothing; it was better to risk the money than human life. That money was in some cases spent well, and in some not.

Mr. Symonds.—I had only recently come to the country when the famine began. At first I was employed in visiting villages and inspecting the relief lists under the First Assistant Collector. We had about 100 to 105 villages under us. Later on, we were ordered to force those who were capable of walking to go to relief camps. They were most unwilling, as they only got in the camps as much as they got in their villages, and the same amount of food would go much further at home than away from it. The village inspector prepared the list first, and we came round to inspect the people on the list, and in some cases we also inspected all the people not on the list, to see if there were any who ought to be on it. We found the work done on the whole very fairly. The inspector more often put on people who ought not to be on than the reverse. Patels were not employed in drawing up these lists, but were told to put on every one who was in danger of starvation as an emergent case; the patels used to give much assistance, but they would always go too far and put on people unnecessarily. I have never inspected or tested any of the mortuary registers, though it is the duty of an assistant collector to inspect all village records and this among them; but I have never given any special attention to these registers.

Mr. Moore.—A European taluka officer with 80 or 100 villages could not exercise much check over them, though he would some; if we had such an officer over every few villages, it would be a perfect system. He should have about 40 villages and inspect five a day. The circles for the village inspectors should be about seven villages. There is great reluctance to leave the villages. Some people said they would die rather than go away, but very few. We carried them away in carts to relief houses, when there was danger of their dying. If I had a system of supervision such as described, the distance test might be kept as a final resource in order to test the necessities of persons whom the inspecting officer suspected not to be in need; but there would always be some persons respecting whom no inquiry would enable the officer to become quite sure whether they were in extreme want or not. I should anticipate no difficulty in getting a sufficient number of circle officers for inspection, if all departments co-operated—schoolmasters, civil court bailiffs, police officers, &c.

I would send all who could do any work, able-bodied and weak labourers, to the large works under the Public Works Department. All quite unable to work I would congregate at relief houses at one or two principal stations in the taluka, so as to have them under good supervision. If the numbers are great, residence should be compulsory. I heard of all sorts of cases of fraud when they were fed at home; patels and kulkarnis put down grain as bought when it was not, and I don't think any supervision could secure their getting their food. The system of village dole was tried under such supervision as we had, and worked badly; but even with the complete supervision sketched above, I don't think it would work. The pauper would get the dole the day the European officer came round to see it, but not otherwise. I think the system of relief-house centres is decidedly the best.

Mr. Keyser.—I do not think that people cannot be fed in their villages, and I believe it would be possible for all those incapable of working to be relieved on village dole; but you must have a test, and if people are fed at home, there is no way of discriminating between those who must be fed and those whom it is not absolutely necessary to feed. People will stay away from work and resort to any tricks in order to get fed at home. I found no very extreme dislike to go to relief camps, and there was comparatively little mortality of them. We had on 23rd June 1877, 3,200 out of a population of 85,000 or 90,000 in Bhimthari on direct relief; but I cannot say how many were in relief-houses and how many on village dole. In March there had been 900. In first week of September there were 5,000, out of whom 1,300 a day were casual travellers. In Indapur the numbers were very much higher; the first week in September the total came to 14,400 a day and 3,000 in a part of Bhimthari. There was no check on the numbers of travellers fed, because patels were authorised to feed anyone who was starving, and they might have sent in any numbers they liked, limited only by the fear of exciting suspicion. I do not, however, think there was any very excessive peculation. The numbers fed in the relief-houses were checked by my constant inspections; I was always riding round and mustering the people.

Mr. Wingate.—I think considerable mortality can only be prevented (apart from migration, where there will always be mortality) by starting relief measures early and by getting every officer to his post before the strain commences. I believe the most efficient and economical system of relief to be to put an officer in charge of a given set of villages and to provide a work for so many such sets of villages; and to let the circle officer have his hospital, his central camp, his village dole, and perhaps occasionally his little work; and the works officer his hospital and his camp. Every large work should be a complete centre for relief, embracing hospital, feeding, nursing, and working arrangements; if the professional officer can manage all this, as he often can, I would encourage his doing so; if he objected or could not, I would give a civil officer to help him. With native circle inspectors under European relief officers, and a sufficiency of officers, I think a compulsory law unnecessary at present; but I think a measure to enforce village responsibility in respect of caring for the few incapable of workiin and of sending those who can work and are starvinng to the Government centres, would be useful, only it would require care in framing and in woking. But village relief I would confine within the narrowest possible limits for the same reason that I object to numerous small works, viz., the impossibility of adequately supervising the relief given or the expenditure incurred.

Mr. Ashburner.—I believe the village organisation in this Presidency is very superior to what it is in Madras or elsewhere; and if the patels are ordered to relieve every sufferer and given money for the purpose, they will do it. You can trust them to give a meal to the distressed and hand them on, but not to feed permanently, on a village dole system, a large number of residents in the village, nor yet to organise any considerable system of relief, involving large numbers, where it would be necessary to give them a discretionary power. For this reason I would not leave the house-ridden people to be fed at home, but would have them brought to a central camp. If there was a very limited number of such people and a good system of inspection by circle officers and relief officers, I would trust the patel to feed these on the list, provided the number did not exceed his capacity for supervision, but I cannot fix a number, as it would vary so much.

MADRAS.

Mr. Longley.—A system somewhat as follows must be organized for such relief:—One or two or more superior officers (Europeans) to be appointed for each taluk according to its size; whose duty should be to supervise all relief. There should be under them a staff of relief inspectors, so arranged that each inspector should be able to inspect each village in his range *at least once a week*, and under them should be placed the local town or village authority in immediate charge of the relief in each town or village.

No form of relief for a district is, in my opinion, complete without the money dole in villages for the description of persons mentioned in the question, also "goshas" who have no one to support them and "caste persons."

The inspectors should inquire into and ascertain the cases of all in need of such relief by moving about from village to village and entering all to be relieved in a register to be kept in each town or village. This register to be checked by the European relief officer at his fortnightly visit.

Relief to such persons should be in the form of a money dole to be distributed weekly or bi-weekly, according to circumstances, money for the purpose being procured on indent from the nearest local treasury.

Relief of this kind should close when prices have fallen considerably, distress is rapidly declining, and the general state of the country improved.

Mr. J. G. Horsfall.—The village officers must be responsible that all the deserving persons are placed before the village inspectors and issue the dole, keeping daily accounts which are checked by the inspectors and superior officers. This system is reported to have worked well and cheaply. For towns with 5,000 inhabitants or more local committees should be fixed to supply the information otherwise furnished by the village officials, and for the better distribution of money dole. The village dole may be closed gradually as the circumstances of the recipients and of the season improve.

Mr. Price.—I believe the only way to meet cases of the kind mentioned to be to form each taluk first into small circles of, say, five or six villages at the outside, and to hold a house-to-house inspection by special agency. If reports from village officials are acted upon, the grossest frauds will occur, and in famine times every one who thinks that he has a chance of getting anything out of Government is prepared with a doleful story. I should begin, as I have said, with small circles and open a register for each village, to be filled in by the inferior inspecting officers, showing the village, name, sex, caste, and age of the person entered, the cause which renders it necessary to put him or her on relief, the date of entry, a column for how disposed, of *i.e.*, when discharged, or died, and remarks. These registers should be given to the village officers who should receive funds from which to make payments. Each set of small circles should be grouped into larger ones under a subordinate inspecting officer who should go round, personally inspect the persons entered, and add or strike off as may appear necessary, examine and check the accounts, make inquiries as to payments to paupers, and superintend some of these. The larger circles should be formed into divisions of half or whole taluks, as may appear requisite, and placed under an European inspecting officer whose duties over the whole of his circle should be the same as those of his subordinate inspectors. This would provide sufficiently, I think, for the discovery of those in want of assistance and unable to help themselves. I would, through the lowest class of inspectors, pay to the persons on village relief a money dole, and subject this to the constant supervision of the circle and divisional inspecting officers. There are so many incompetent and knavish village officers that I would, had I to deal with another famine, not pay, as we did, through them, but make them only assist the minor circle inspectors. These latter might very well be chosen from the best of the village officers. I would make the inspectors keep an account of payments to each individual, and these might be made two or three times a week. I hardly think daily payments necessary. The amount of the dole given should, I think, correspond to the value of the poor-house ration. This, of course, supposes that only those unable to support themselves, and having no one capable of maintaining them, are admitted to relief. The question of how to deal with the sick is a difficult one, for giving them all medical aid would involve very heavy outlay; and I have more than once found that when I sent a medical officer to any place where sickness was very rife, the people refused to have anything to say to him or his medicines. The

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only thing that I can see to be done would be to give the sick relief in money and leave nature to herself. I would allow paupers unable to come to the place of distribution to receive their dole from the inspector in person, or, subject to frequent inspection and inquiry, to send some one for it. I would close village relief entirely when the condition of the country and people approached its normal state, compelling such of those then receiving relief, and who had no means of support, to go into a poor-house, which should not be closed until the famine was completely over.

Mr. Austin.—This question brings me to the subject of village relief. I have been supervising this form of relief more or less since its introduction. My opinion is that it has been a very great failure. The chief result of the system has been to hopelessly demoralize our village officials in the first place, and the people generally in the second. The number of village officers who have been dismissed and suspended for offences connected with village relief is enormous. In some instances the whole of the village officers' relatives were put *en masse* on relief, in other cases only a few of their near relatives; complaints by the paupers of non-payment of relief were numberless. The usual trick was to pay for several days at once and then deduct a large per centage of the pay as a perquisite. In other cases they were always paid correctly enough, but were obliged to purchase their food from a bazaar kept by some relatives of the Monigar, who thus plundered them by selling grain at prices far beyond their ordinary rate. If they grumbled they were simply struck off relief, and when an officer inspected the village he was told that their names had been removed as some relatives had come forward to support them, or something of the kind. Meanwhile the unfortunate paupers had probably died from starvation or wandered away from the villages in hopes of getting a subsistence by begging. It was found to be almost useless to attempt to hold magisterial inquiries into such cases. Long before the case could be heard the paupers had been settled by the village officers, and when they appeared in the witness-box affected to be unable to remember what they had received or when they received it.

Had I to go through another famine I should strongly advocate the giving of no village relief whatever, and in its stead would organize relief camps on improved principles and in far greater number. A close house-to-house inspection would be necessary in every village to see that the sick and helpless were not left to die of starvation, but this would be an easy matter compared with the supervision of village relief. The Monigars would be held criminally responsible for any death that occurred through their negligence, and as he would have nothing to gain by keeping such paupers in his village he might be safely trusted in most cases to send them to the nearest camp.

By this change of system I believe both Government and the unfortunate pauper would greatly benefit. It is notorious that the money dole is utterly insufficient, and partly from this cause, viz., that the rate is fixed with reference to the price of grain in the cusba town, while the value of grain varies greatly in the towns and the villages.

Mr. Oldham.—The house-ridden, cripple, and decrepid class.—I would only give relief to those who have homes—houses—to which they are confined, and would collect the rest in relief hospitals. I would then relieve through the circle system making the village officers the dispensers of relief which should be in dry grain. Dry grain is to be recommended instead of money for a good many reasons.

I have three times had experience of this sort of relief (home relief), and never found the slightest difficulty in closing it. As I have said, the recipients themselves recognise the time when it should cease. I have heard objections raised to it by very high authority on the ground that it could not be closed, that it pauperizes the recipients and so on, and all such objections have struck me as being in practice entirely futile.

The Right Rev. Bishop Caldwell.—People who cannot leave their homes.—People who are unable to leave their homes will have, I fear, to be left to the care of their friends and the charity of their neighbors; but when this is found to be the case, the number of such persons will be found to be exceedingly small. Anyhow, whatever arrangements may be made, the help of friends is probably the only help they will actually receive.

* * *

With regard to both this question and the previous one, it may simplify matters if I state that, in my opinion, the gratuitous relief given by Government should be absolutely confined to the relief given to the inmates of poor-houses. Every thing beyond this should be left to private charity.

N.B.—I take the opportunity of expressing here an opinion for which I do not see any appropriate place elsewhere.

I am of opinion that under no circumstances should money be entrusted to petty village officials for distribution amongst the famine-stricken in the shape of doles of money or food. There is absolutely nothing to prevent such persons, wholly uneducated themselves and living amongst a population wholly uneducated, making the greatest misuse of the money entrusted to them. Public opinion does not yet exist amongst such classes, or if it exists is on the wrong side. No charitable native, if he wishes his charity to be useful, will make petty village officials his almoners.

MYSORE.

MYSORE.

Mr. Ricketts.—The persons here referred to would be put upon the village grain dole. Their cases would be first inquired into and represented by the village potail and shanbogue, passed by the sheikdar and checked by the amildar and other superior relief officer. The relief would be in grain given weekly by the sheikdar through the potail or a shopkeeper, and the payment duly certified by the village punchayet. This form of relief would to all practical purposes close itself at the end of the famine.

QUESTION 32.—ORPHAN OR DESERTED CHILDREN.

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What has been held to be the duty of Government in respect to orphans or deserted children, and what appears to be the correct principle to follow? What number of such children have been thrown on the State during the recent famine? What arrangements have heretofore been made for receiving and supporting them, and what has been their ultimate destination? What have been the practical results of the measures thus taken in the past? What appears to be the best system to adopt in the future?

Punjab.—Orphans will best be made over to people of their own faith. Some have been made over to missionaries, but this is opposed to the popular wish.

North-Western Provinces.—Experience similar to that of Bengal.

Bengal.—The Behar and Orissa Government undertook the care of orphans in the first instance, and afterwards made them over to missionaries.

Bombay.—Orphan and deserted children were cared for by Government. At the end of the famine some were claimed by relatives, some adopted by rich natives, some entrusted to missionary bodies. One orphange was opened by natives.

Madras.—Fourteen European and three Native gentlemen have replied.

There is a general consensus of opinion that an obligation rests on the State to take charge of orphans and children abandoned by their parents during the pressure of a famine. At the close of distress many deserted children are reclaimed by their relatives, some few are adopted by charitable persons of all classes and creeds, and the residue are taken charge of by the Christian Missionary Societies. Wherever really respectable persons can be found willing to take charge of orphans of their own creed, this mode of disposing of them is considered to be the least open to objection.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—It is the duty of Government to support orphans or deserted children. The people say that civil officers in famine times make over orphans or deserted children to missionaries, with the result that Hindu and Muhammadan children, without the knowledge of their parents, and while they themselves are unable to express their intentions, are made into Christians; and thus the ignorant people have suspicious ideas of the generosity of the Government. The best way of supporting such orphans, &c. would be to make them over to the persons of the religion to which the orphans or deserted children are found to belong, to be supported through them until the famine is over; when the famine is over, they should be made over to such of their relatives or family connections as can be found; or if none can be found, then to any persons of their own class or caste who are willing to support them. In the last year's calamity there were only two orphan deserted children who were sent to the Amritsar Mission with a little money from the District Local Funds for their support, but such a measure is opposed to the wishes of the people.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—To make over such children to respectable persons of their own castes or faith who are willing to support them and have sufficient means to do so, and if such persons are not forthcoming or the parent's faith is unknown, to make them over to a Christian orphanage. All orphans or deserted children should be sent to Christian orphanages. However respectable the person may be, the child he receives while there is a famine is sure to be looked upon by him as his slave. During the recent distress in this district the number of children thrown on the State was—

Muhammadans.		*Hindus.*		*Unknown.*		
Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Total.
—	3.	9	17	6	28	63

In the first instance they were made over to the charge of the Court Inspector pending inquiries as to their relations. After this if there were no respectable persons willing to take charge of them they were made over to the Rev. Messrs. Johnson and Hoskins, American missionaries at this station.

The total number made over to the missionaries to be brought up at their schools as Christians to follow some trade was 63.

The total made over to respectable natives was 38.

The majority of the orphans or deserted children were Hindus of low caste. No Hindu applied for any of the children. Muhammadans of respectability would have been willing enough to accept girls of the lowest Hindu caste.

Mr. Kennedy.—The total number of unclaimed children sent to the Mission Orphanage was 15. A few were also distributed to natives who desired them. Applications are continually made to the Collector by persons claiming to be the near relations of famishing children for permission to transfer them to wealthy natives. In such cases the professed guardian generally expects to receive food or money from the grantee, and occasionally the importunities of these people are so great that the grantees have applied for permission to re-transfer the children. I do not myself see any reason for checking this transfer of children, provided that there is some security for their good treatment. A register should be kept for all such cases, the treatment undergone by the children should be inquired into from time to time, and the children be at liberty to depart whenever they please. If such a plan works well under proper regulation with voluntary transfer, there is no reason why the State should be ever burdened with the support of orphans thrown upon it. The only advantages of State orphanges consist in the security for good treatment. If this security can be otherwise obtained, the advantages of domestic training ought, I think, to outweigh the advantages of nominal Christianity.

Mr. R. J. Leeds.—As regards Hindu children of the lower castes, who form the majority of the orphans in most districts, it is impossible to apply the rule, for high cast Hindus will not take them and low caste Hindus are, as a rule, too poor to do so. The only alternative therefore is either to entrust them to Christian Missionaries or to Muhammadans of respectability.

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Mr. R. H. Story.—The action of Government with regard to deserted and orphan children has been to allow respectable persons to adopt them. Where the numbers have been many, intimation has been sent to the different missions and orphanages throughout the country. In time the children have all been provided with homes. Until this is accomplished it is clearly the duty of the State to support them.

Seventeen orphans were thrown on the hands of the district authorities during the late scarcity. All these children have been provided with homes with respectable persons and are getting on very well, and are much better off than they ever were before. I cannot think of any improvement on the present system.

Mr. Mellor.—There is no difficulty in getting respectable Muhammadans to take charge of deserted Muhammadan children.

There is a difficulty with regard to Hindu children, and the matter has not yet been decided. If Hindus will not take them, and they will not do so as a rule, I see no reason why they should not be made over to Muhammadans. It is impossible to find out generally even to what caste they originally belonged, and the only other alternative course is apparently to make them over to some Christian orphanage.

BENGAL.

BENGAL.

Mr. Barlow.—Government has always accepted the immediate care during famine of orphans and deserted children. It is difficult to see how the practice can be changed or abandoned, seeing that helplessness demands and justifies protection. During 1873–74, 37 orphans only were finally left on the hands of the authorities in this division. Of these, 14 were made over to the missionaries for education, Government making a small grant of maintenance allowance, one died, and the rest were made over to relatives or other suitable persons willing to receive them.

The children made over to the missionaries are brought up as Christians, and are looked after until and even after they are established in life. The others disappear from observation.

The operations in this direction have been upon a small scale here. They were, as far as I recollect, of a similar character and upon a large scale in Orissa. No practical difficulty has been experienced, and I am unable to suggest an improvement upon the plan heretofore followed.

Mr. Toynbee.—In the Orissa famine the principle observed with reference to orphans was that the Government should assume in the first instance the charge of the children and make the necessary arrangements for their maintenance. This was done in consultation with the members of the Local Relief Committees, on which Europeans and Natives of all castes were represented. The balance of funds at the disposal of the Relief Committees were made over to Government on part account of the orphans, but it did not suffice to cover the expenditure. In carrying out this principle into detail it was found that the Hindu and Musulman community were not willing or able to give a sufficient guarantee as regards the future of the children, and the majority of them were therefore made over to Christian missionaries. On the 31st December 1867, there were 1,486 children in charge of guardians selected by the Local Committees. The Government paid Rs. 3 a month for each child; if a boy, up to the age of 17; if a girl, up to the age of 16. On attaining these ages the Government granted to each child of each sex a bonus of Rs. 20. All these children have been gradually absorbed into the Native Christian population, and have settled down to the ordinary pursuits of persons of their class. The principle followed in the Orissa famine seems to me to be the proper principle for future adoption.

At the close of the famine of 1874, 111 orphans were left on the hand of Government, 97 in the Patna, and 14 in the Bhagalpore division. As in Orissa, the Government made these children over to the care of missionaries, taking a grant of Rs. 40,000 from the Central Relief Committee, and giving an allowance of Rs. 3 per mensem for each orphan up to the ages of 17 and 16 in the case of boys and girls respectively.

Mr. Kirkwood.—It has been held to be the duty of Government to maintain, educate, and settle in life all unclaimed famine orphans. In Bhagalpore there were at the close of operations only some 50 orphans collected together in the Soopole poor-house; relatives came forward and claimed some 20 of these, and the rest were (I *think*) sent to a mission school at the town of Bhagalpore.

In Orissa generally, in 1866 and 1867, there were, of course, large numbers of famine orphans. These were mostly picked up at the feeding centres, and were thence despatched to the Baptist missionaries at Cuttack and elsewhere. They were supported from the relief committee's funds, aided by a monthly grant of Rs. 2 per head from Government. As some of the native gentlemen at Cuttack objected to these children being christianised, it was conceded to them that they might open an orphanage which should be under their own management, and be supported from the committee's funds. But this orphanage was not sufficiently commodious, its numbers were never large, the management was not so good as might have been desired, and I think it became abolished before the close of relief operations.

Many of these poor orphans died shortly after their arrival in the orphanages,—they had sunk too low to recover; many managed to run away; many were towards the close of operations claimed by relatives. At the close of operations in 1867 there were in the missionary orphanages in Orissa about 1,500 orphans. The management of them was left entirely to the missionaries, subject to the control of a permanent committee, consisting of the commissioner, the collector, and civil surgeon, for the time being. Government eventually made an allowance to the missionaries at a fixed rate per head. This rate was Rs. 3 per mensem for boys up to 17 years of age, and for girls up to 16. Boys, on their reaching 17, and being then put to earn their living, were given a donation of Rs. 20; the girls received the same sum on marriage or on attaining the age of 16. The Cuttack Native-Christian community was already so large that these additions had many friends ready to receive them into their social circle. Many of the girls married the boys; but the girls were far more numerous than the boys; and there has, I believe, been since some difficulty in getting them married off. The young men of the Christian community took several of them to wife, but still there was a surplus.

The boy orphanages were separate from those for the girls, the latter being managed by the ladies of the mission. The orphans were all taught writing and reading. The boys learned carpentry, weaving, agriculture, and the trades of goldsmiths, blacksmiths, &c. From private sources lands in the neighbourhood of the town were given to the mission, villages were there constructed, and many of the more reliable of the newly-married couples were there settled. The girls learnt cooking, washing, sewing, and other useful occupations calculated to fit them to be good housewives.

BOMBAY.

Mr. Norman.—It has always been held to be the duty of Government to support orphans and deserted children, and this principle should be adhered to. During the last famine the number of such children was very few. They were received into poor-houses, where they were collected in nurseries and taken care of by old women. At the end of the famine most of them were claimed by their parents or by some other relation. A few remained who were eventually adopted by well-to-do persons. The Missionary Societies obtained possession of a few orphans, whom they are now bringing up, and this would be the best way of ultimately disposing of any children left on the hands of Government. No such cases, however, occurred at the end of the last famine.

Mr. Spry.—Beyond maintaining orphans and deserted children in relief-houses so long as they were open, Government has not done anything in this district for them. But it appears to me that if Government exacts special taxation for famine purposes the providing for these children until they can look after themselves is a legitimate charge on such taxation. During the famine several hundreds of these children were thrown on the State, but as the famine wore off numbers of them found relations and friends willing to take care of them. In the end only about 60 remained, and these were received in the orphan asylum at Pandharpur, in the Sholapur district, an institution started and maintained by private charity for the special purpose of receiving famine orphans, &c. Thus far, therefore, there has been no difficulty.

Mr. Percival.—The number of friendless orphans is quite small. Children come to the poor-houses and say they are orphans, but at the end they are generally claimed. An orphanage under private management, but receiving all castes, was started by some charitable natives at Pandharpur. Orphans were sent to it from this and the neighbouring districts, but there are only 102 children in it. Applications from respectable people on the spot to adopt orphans have been entertained, but no orphans have been sent to a distance, so that parents or friends can claim them at any time. The arrangements at the Pandharpur Orphanage are good, and it is proposed to develop it into an industrial school; if private funds should fail Government would have to take it in hand.

Mr. Bosanquet.—There were a good many deserted children here during the recent famine, but, as circumstances improved, many of them were claimed by relations. There were not more than a score or two here at the end. Of the few that survived and were not claimed by relations most are now under the care of the Balé Mission in Dharwar. I have been informed on the best authority that the care taken of the children by this Mission is in all respects everything that can be desired. Three or four are under the care of the S. P. G. Mission at Kolhapur, and five or six are in the Roman Catholic Institution at Bandora.

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Mr. J. G. Horsfall.—Government must maintain orphans and deserted children so long as private charity does not do so. Eventually very few orphans are left in the hands of Government. In nearly all cases they are claimed by parents or relatives or taken charge of by charitable natives. The number left under the protection of the State in this district is only three, and out of these the American Mission are willing to take two.

Clause III.—After the Ganjam famine the orphans were distributed to the three religious institutions in the district, Mr. Okley, the chaplain, taking some, the Roman Catholics others, and the Baptist Mission the rest. A lump grant was made on account of them from surplus subscription funds, and Government further contributed a monthly grant for each child up to a certain age. The orphans have been taught to read and write and brought up to useful trade, and professions, and have generally been able on arriving at maturity to earn their own living. The cost to Government now is very trifling, and will cease altogether in another year or two. Where existing institutions are willing to absorb all the State orphans this plan might be continued. It will be under very exceptional circumstances that Government will find it necessary to establish an orphanage of its own.

Mr. Price.—I do not know that any dictum has been laid down. The principle followed—and I believe it to be correct—has been that it is the duty of the State to receive and protect all orphan and deserted children. During the famine these, or children alleged to fall under this category, came upon our hands in very large numbers, and were either placed in the charge of village magistrates to be fed, or to receive the dole fixed by Government, or else were taken into the poor-houses. They were picked up by the village magistrates and the police, and found in the villages by inspecting officers. As organization progressed all orphan and deserted children on village relief, who had not friends or relatives willing to look after them, were taken into the poor-house, placed under a selected nurse, and there fed and cared for. I really could not say how many orphans and deserted children were thrown on the hands of the State during the famine. In Cuddapah a register of those actually found to be friendless was kept, and a return sent in every week to the collector. These statements are on record, but they did not show orphans in villages whose relatives were taking care of them. Here no lists were, until a very late period, kept. At the beginning of the famine orphans and deserted children were, in Cuddapah, placed in the charge of a woman selected by the tahsildar, who received a monthly payment of from 2 to 4 rupees, but I found this plan unsatisfactory and discontinued it. By far the larger number of orphans and deserted children have been claimed by relatives; a few have, I believe, been taken by charitable people and religious societies, and a very few are still left in the poor-houses. As far as this district is concerned, I consider that there will not be twenty-five of these children, if so many, on the hands of Government when the famine is over. As far as the Cuddapah District was concerned, I believe that the measures taken resulted in saving the lives of many hundreds of children and in their being, when discharged from relief, in excellent condition and spirits. In future I would, from the first, have no giving out to nurse. I am very much in favor of at once putting all children ostensibly without parents or relatives who cannot shift for themselves into a poor-house. This course would—so I found when I adopted it—bring forward the relatives or sometimes even the parents who were alleged to be dead, and would enable the officers concerned to get, at a much earlier period than the end of a famine, some definite idea of the real number of orphans and deserted children on their hands. As regards the disposal of children left on the hands of Government after a famine, I believe that the religious institutions of the country and the charitably disposed would take charge of all whom we are ever likely to have. If not, I would have a home for the girls, and put the boys upon a Government farm in order that they might be brought up as skilled laborers. They would always be able to earn a live-

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lihood by these means and would, to a certain extent, pay for their maintenance.

Mr. Pattabhiram Pillay.—Orphans and deserted children incapable of maintaining themselves were at all times held as a charge upon the State, till some one is found to take care of them, and, in my humble opinion, there cannot be a more correct principle. It is not difficult in India to find charitably-disposed men willing to take care of such children out of sympathy for them. There are besides several Christian institutions where they will readily be admitted in view to their being made converts. I would rather leave it to the conscience and good feeling of those in charge of such institutions to make these orphans their converts or not as they choose, but would make such children over to the first applicant who wishes to take charge of them, as the duty of Government to protect them ceases as soon as some one offers to take charge of them.

Mr. Soobien.—As regards orphans and deserted children, the duty of Government has been held to be to take charge of them and support them, and the correct principle to follow appears to be the same. I have no statistics regarding such children with me now, and am therefore unable to state the number of such children thrown on the state during the recent famine in the Madura taluk. These children were received and fed in relief-camps with the ultimate object, in the case of deserted children, of making them over to their parents when they were found. In some places such children were made over to missionary bodies with the certain result of their being converted to Christianity. This appears to me, however, to be objectionable, as the accidental circumstance of their being left parentless and friendless owing to the horrors of famine should not be taken undue advantage of in bringing them up in a religion different from that of their parents. The proper course appears to me to be to bring them up as they were found till the parents or some one of their caste willing and able to adopt and support them are found, or till they become able to support themselves, or to send them to any public workshop where neutrality of religion is observed and where a useful industry can be learnt.

Mr. Oldham.—The practical results of the measures taken with regard to the orphans of the Orissa famine of 1866 have been that the orphans have been brought up as Christians, and cut off from their own caste and village people as far as their religion and its consequences cut them off, but have otherwise fared well and been turned into useful workmen or servants.

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Mr. Ricketts.—It has been held to be the duty of Government to provide for orphans and deserted children, and this appears to be a correct principle. The number of such children thrown on the State during the recent famine amounts to about 2,050. These children have been received into a Government orphanage and thence drafted to missionary bodies and private individuals; their future maintenance up to a certain period being still a charge upon Government, except in two instances, one of Miss Anstey at Colar with 231 orphans, and one of Rai Bahadoor Arcot Narrainsawmy with 105 orphans.

As regards those orphans left still on Government, I would try the experiment of apprenticing them to potails and respectable ryots, and when ere long a market would be found for their labour, ending eventually in the more industrious becoming small ryots or farmers on their own account. If the orphans could thus be disposed of without further expense to Government, and I think this would probably be the case, then I would withdraw the Government allowance granted to missionary bodies, and others, and, if they thereupon returned the orphans, which would hardly be the case, they in like manner should be apprenticed to potails and other ryots of respectability. There is a greater difficulty about girls, and endeavours should be made to marry them off as soon as possible.

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QUESTION 33.—SALE OF GRAIN BY GOVERNMENT BELOW COST PRICE.

Another form of relief, independent of a labour test, is by purchasing grain and selling it at or below cost price, and consequently below the retail market rate. Was this measure resorted to in your district under what circumstances, and with what results? Do you consider that there are any conditions under which it is proper for Government to have recourse to such a step? (This question does not refer to the propriety of Government importation generally, but of importing or purchasing in order to sell cheaper than the market rate.)

Punjab.—No experience of purchase of grain by Government.

North-Western Provinces.—Opinion opposed to purchase of grain, unless in very exceptional circumstances.

Bengal.—A large majority of opinion is in favour of Government selling grain when prices are very high, but it is held that in Behar in 1874 Government latterly lowered the price at which it sold its grain unduly, and that grain should not have been sold below 10 seers to the rupee.

Bombay.—The general opinion is opposed to the purchase and sale of grain by Government, but municipalities may do this with advantage.

Madras.—Seven European and two Native gentlemen have replied.

Grain was not purchased and sold below the market rate. The general opinion is that this should never be done except when there is no prospect of private trade supplying the market.

PUNJAB.

PUNJAB.

Muhammad Hayat Khan.—The form of relief described in this question is good and pleasing, and, if resorted to, would establish the Government's benevolence in the minds of the Indian population. The great reputation of the Emperor Shahjahán in a famine calamity of his time was caused by the same measure, *i.e.*, he bought grain from that part of the country where there was no famine, and sold it cheaper than the market rates in the famished part of the country. Although no such measure was

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resorted to in this district, and though Government is under no obligation to have recourse to such a step, I yet think that the measure, if adopted, is pleasing to the people, and would create good ideas in their minds; and, moreover, the grain dealers, who in famine times frequently reduce the rate, and do not sell it in hope of a further rise in price, would thus be prevented from such a bad practice, and the men who have money to buy the supplies, but not so large as to support them on the dearer rates, would greatly benefit by this measure.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Story.—On one occasion at Jhánsi, in the famine of 1868–69, the grain dealers in the city of Jhánsi (belonging to Gwalior state) combined together and refused positively to sell grain at any price. The Commissioner on this had grain imported into the district, and got up from Cawnpore about 150 camel loads of grain. A bazaar was opened, and the grain sold at about cost price. This had a good effect; the grain dealers opened their shops, and never attempted the same combination. The conditions under which the importation of grain is proper for Government to have recourse to is in a case like the above, where, through the combination of a few dealers, distribution of supplies is stopped altogether. In out-of-the-way places with bad communications, and where traders are not able to meet the demand, and the stock of grain is so low that there is imminent fear of the supply getting exhausted, it would then be the duty of Government to import grain, otherwise any interference with trade and prices should be most strictly prohibited.

Mr. Gardner.—The only time I have ever seen this measure resorted to was in 1867, when I was in charge of the Himalayan district of British Garhwál. The circumstances were as follows. It was apprehended that there would be great scarcity during the hot weather and rains, especially in a region separated from the plains markets by about five marches of mountain and one or two marches of forest and valley. The hill men have, or had, intense repugnance to pass through this region during the hot weather and rains; it was known that they would rather starve than do so. Under these circumstances stores of grain were purchased in March, when grain was cheapest, at the foot of the hills, and were carried up and stored in the hills; when the period of scarcity began the grain was sold at a price to cover all expenses, or was paid away in wages on relief works at an equivalent to the regular wages of labour.

BENGAL.

Bengal.

Mr. Hodgkinson.—In 1874 large quantities of grain were imported into Sarun by Government, and in my opinion very serious and unjustifiable interference with trade was caused by disposing of it in various ways at a rate considerably cheaper than the market rate. Not only was the power of trade greatly neutralised, but the people became demoralised and reckless, seeing the extraordinary exertions of Government, represented by its officials, to get rid, apparently, of as much grain as possible by some means or other. Besides the inducement to take advances held out by fixing a low price on the grain, the people were practically lead to believe it was almost their duty to take advances, and many of them took them recklessly, strong in the belief that a paternal Government would never demand repayment. The bitterness of feeling aroused among the people by the proceedings in realisation of these advances may be inferred from the common remark quoted by my predecessor in his annual report of 1876–77 to the effect—that they would sooner die of the famine than be again induced to take advances from Government. Coming to the district again after 3½ years, I cannot shut my eyes to the discontent which is abroad, and must regard the shock which the confidence of the people in Government has received by the direct and indirect results of the famine operations of 1874 as a grave calamity. I can conceive no condition which would justify the importation of grain by Government with a view to undersell the ordinary trader, if trade exists at all in the distressed district.

Mr. Barlow.—The measure described herein has not been resorted to in my experience. The arrangements which took place here in 1873–77, and which, at first sight, might appear to mean the same thing, were really of a different character, and originated in a different view. Government had made large importations of grain, fearing that, in the parts of the country cut off from trade, supplies would cease and prove insufficient. When prices reached a certain high standard and were in fact declared nominal, *i.e.*, no quantity of food was to be procured in the bazaar at rates quoted, then Government grain was sold at a fixed rate. The object of the measure was not competition nor to undersell the market, but to keep up supplies under circumstances of a failing market. I have no reason to think that the results were harmful.

So far as the above conditions (no supplies and no trade) have real existence in any case, Government must import or purchase and sell in order to prevent starvation overtaking all classes, those having means as well as those without; but if sufficient supplies are available in the market, I should consider the form of relief proposed in the question, viz. underselling the market, the worst possible, as it involves the offer of relief, without test or restriction, to the entire population, and must inevitably kill trade.

Mr. Toynbee.—The form of relief indicated in question 33 was adopted with marked success in the Pooree district in 1867. The Orissa famine was purely a rice famine, and, owing to the isolated nature of the province, and to the absence of any external trade with other provinces, the Government had to step in and supply the place of private trade and enterprise. It is under such circumstances only that such a step would have been, or would in future be, justifiable. The chief benefit of this form of relief in the Pooree district was the confidence it gave to the people generally. It prevented any combination among local dealers to keep back such stores as they still had in hand. The result was indirect rather than direct; for between March 1867 and December 1868 only 13,064 maunds were sold to the public in the whole district. The cost of this relief to the charitable committee by whom it was undertaken was at the rate of annas 15–8 per maund, this being the difference between the cost and sale price of each maund.

Mr. Metcalfe.—I have known instances of advances of grain being made at rates considerably below the retail market rates, as also of seed grain being sold below its market value to villagers suffering from scarcity of seed. In Behar there was no coarse rice in the bazaar for sale at all, and the Government prices were below the rates for the finer qualities. I should

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say that only under conditions of collusion amongst local banias ought grain to be sold by Government below the market rate. Interference with trade generally is unjustifiable, but collusion amongst local traders is quite possible, indeed frequent; it may be quite legitimate, but may cause much distress.

Mr. Kirkwood.—In my opinion, Government, whenever it has imported or purchased grain, should never sell dearer than the market rate, should never sell at the market rate, and should always, when selling at all, sell cheaper than the market rate. It should sell at one fixed rate, unchanged and unchangeable, throughout the famine, no matter what the market rate may be. That fixed rate should be three times, or a point cheaper than three times, the ordinary rate obtaining in prosperous times. That rate should be fixed and announced in the most public way possible at the outbreak of a famine, and Government should declare its firm resolve, by having large stores in hand which it will open for sale to the public in any locality the moment the market rate rises above that rate, to keep prices at, or lower than, that rate. Not less emphatically should it declare its resolve that, throughout the continuance of the famine, so long as grain sells in the open market at that fixed rate or cheaper, not an ounce of grain except in distribution of relief shall leave its stores.

By such a measure Government can at once keep the bulk of the people from starving. It sets limits to the famine and defines the borders beyond which distress shall not go amongst that large class who, just removed from the class of day-labourers, are otherwise certain to be sucked within the vortex.

If I might venture to express such an opinion, I think some errors have marked the efforts at relieving the sufferers during the recent famine in Southern India. But, in my humble opinion, worse far than the delay in getting on foot the village relief, worse than the undesirable extent to which poor-houses were opened and cooked food was distributed, worse than the general absence of any such relief, worse than the system under which earthwork was for the most part carried on, was the error of refraining to hold in the distressed localities large stores of grain ready for disposal as above noted, and of allowing prices to range through whole districts for many months at from five to eight times the ordinary rates. That one point being conceded, I venture to think it no wonder that the calamity became uncontrollable, or that a heavy mortality ensued.

I may say that I have had experience both of Government importations for sale and importations not for sale. In 1866 the Government grain imported into the Cuttack district was so little, and such a very small remnant of that little was available for sale, that such sales were in no way operative in checking prices. In 1867, in the Cuttack district, Government imports were plentiful, and sales at fixed rates were freely carried on at numerous places throughout the distressed area, with the greatest advantage to the people. That also was the case in Bhagalpore district in 1874. But in both these cases there was a somewhat undesirable delay in opening the stores for sale. This was particularly the case in Bhagalpore, where sales should have commenced a month earlier than they did, during which month market prices were painfully high. I must also venture to regard it as a serious blemish on this measure of relief in the Behar famine of 1874, that the rates at which Government grain was sold were so often changed. The change did not merely follow the downward rates of the market—that would have been bad enough, but led by a long way the downward process. Commencing at 20lb. per rupee, a price not quite treble of the ordinary rate, at which price these Government sales were in Bhagalpore largely resorted to, Government, I think unnecessarily and unwisely, lowered its selling price, bit by bit, to double the ordinary price. Such a policy, I venture to think, calculated to turn the exercise of the most praiseworthy private enterprise in importing grain into a speculation of a most hazardous nature, leaving the ruin of the importer actually from day to day at the mercy of the Government. It is for this reason that I urge that the sales should be at a fixed rate only, never varying until the famine is over, thereby rendering Government sales only operative when the market price is higher than that rate. Prices would thus be steadied, and, far from interfering with private trade, the policy advocated would enable the private trader to calculate with accuracy the risks of his enterprise. I think the history of past famines to be conclusive in asserting that trebled prices cannot be exceeded for any time without a grievous calamity, if those prices have been caused by a failure of harvest. In districts which have had fair harvests anything like a trebled rate, owing to excessive exportations, will never, I think, be reached. If it were reached, Government interference would not in such a case be desirable. A large amount of money must have come into the district as the result of its exportations, and the high figure of trebled prices would never be long maintained. I have known of a doubled rate being temporarily brought about through exportations, but never of higher.

Mr. Kisch.—It was not resorted to in Bellary, where I was, in 1877–78. It was resorted to in Tirhoot in 1874. There we sold grain when the market rate rose higher than Re. 1 for 10 seers. My circle was on the Nepal frontier, almost due north of Mudhubani. The people were poor, the roads were bad, there were no large traders likely to import grain to any extent, and there was no large bazaar within the circle. On the whole, I think, the result was good so long as we did not give more than 10 seers for a rupee, but I am quite satisfied that the sale of Government grain should have stopped the moment the market price was cheaper than Re. 1 for 10 seers. Instead of that, we reduced the price of the Government grain and seriously interfered with trade. It is only in tracts where grain is ordinarily extremely cheap that Government would be justified in selling at so low a price as Re. 1 per 10 seers. In Bellary, where importation was carried on to the utmost power of the railway company, any attempt on the part of Government to sell grain would have been utterly unjustifiable, and would certainly have been most disastrous in its results. I have said above, that, on the whole, I think the result of the North Tirhoot sales was good so long as we sold at 10 seers per rupee, but I do not think that it was proper for Government to sell at that rate. It would have been far better to fix the full cost price of the grain at the price at which it must be sold. Government could not then possibly have interfered with trade, for private dealers can make a profit by selling at the price that only covers the expenditure incurred by Government. If this principle were adopted, Government would really only sell grain when the supply in the hand of private dealers is actually insufficient for the wants of the people.

Mr. Magrath.—Grain was largely imported into Mudhoobunnee, and sold there at 10 seers per rupee, as soon as rice went below that rate. This was done because there was little or no grain in the country, and there were no importers. The results were that there was grain; whereas, if not imported by Government, there would have been none. I consider that in cases like that of Mudhoobunnee, where the larger part of the grain had been exported and no machinery for importation existed, the action of Government was the only plan possible. By April there was no bazaar rate, as there was none but Government grain in the subdivision.

Mr. Abbott.—A most necessary measure, as it causes the local grain-holders, who would otherwise hoard their stores waiting for higher rates, to bring it into the market, enabling the district officers to obtain reliable statistics of the actual amount of grain in the country, and thus judge of the quantity necessary to import.

CENTRAL PROVINCES.

Central Provinces.

Mr. Nicholls.—In Murwara, where there was a difficulty about getting sufficient and reliable supplies in the local markets, Mr. Olpherts purchased grain on easier terms in Allahabad, but to the best of my recollection this was entirely used on our relief works and in the poor-houses. In Chanda, on account of a belief that the export of grain from His Highness the Nizam's dominions had been prohibited, an advance of Government money was given to a trader to purchase grain for the consumption of those employed on the Government relief works. As soon as this was done, all the private traders and well-to-do people took courage, and made such efforts to import grain, that little more assistance in this district was required from Government.

In Damoh the Deputy Commissioner found the holders of grain entirely refused to sell, as they would not listen to reason, and he sent an order for the purchase of Rs. 10,000 worth of grain at Jubbulpore. Some amount was bought, and on arrival in Damoh was sold at cost price. But the sending of the order followed also by similar private orders was sufficient to bring grain again into the market; either the panic ceased, or the combination of the grain holders was broken through.

The Deputy Commissioner of Balaghat supplied the following information:—

In September wheat got dearer, and though nominally at the previous rates, was more difficult to obtain. For the workpeople on the ghats special arrangements had to be made; by the end of the month malguzars began to refuse to supply the villagers on the usual terms, and the agents of large firms at Nagpur and Kamptee would not sell. Roads were impassable, and grain was being exported by river.

Zamindars and malguzars were called in and consulted, and they placed some considerable amount of grain at the disposal of the Deputy Commissioner, which, later on, enabled the district officer to continue his relief works and maintain his poorhouses, and also to throw small quantities now and then into the markets at current rates.

BOMBAY.

Bombay.

Mr. Norman.—I am strongly opposed to any proposal for purchasing grain and selling it below cost price. Any such system would, undoubtedly, interfere with the trade of the country, and might lead to most disastrous results. The system was not resorted to in this district, and I can conceive no conditions under which it would be proper for Government to have recourse to such a step. Occasionally I think it may be advisable to endeavour to purchase grain in the cheapest market and retail it at a slight profit. This would break down any possible combination among the dealers. I confess, however, that I do not believe in combinations, and I think it best to leave trade to take care of itself.

Mr. Spry.—The purchasing of grain, and reselling it at or below cost price, was not resorted to in this district. Such a measure, I would think, had better be avoided by Government, as it may create false impressions regarding interference with trade. I do not know any condition under which Government would be justified in adopting it. But, at the same time, it is a very legitimate species of relief for municipalities to adopt towards the poor residing within their limits.

Mr. Percival.—Government should avoid all interference with the grain market. It happened here, and may happen elsewhere, that for a week or two there was a panic, and no traders would part with their grain at any prices at certain places. Both Government and some of the Relief Committees had to buy grain at the larger or distant markets and send it to relief works, but this was exceptional, and gave way before the first importation of grain by the railway. It would not happen again in this district.

Colonel Anderson.—Though an entire advocate of non-interference in the grain trade by Government, yet I think there are cases in which it might be desirable to purchase. First, in the case of inland districts with bad communications, after the rains have commenced, with the rail. If it was clear that famine must be prolonged some months after the setting in of the rains, it would be well, before matters had gone too far, to enter into contracts on the spot for delivery of at most say a month's food for relief houses and works at a certain price on a given date at named places or centres, or possibly to obtain possession of the grain at once and place it in store. This grain I would only make use of in extreme emergencies, if the local price rose beyond a certain point, leaving a full profit to the dealer, taking all pains to make the dealers understand this, or in case imports should cease from stoppage of roads. This measure would be the more advisable or excusable in cases in which it was known that there were large local hoards which fear for the future locked up, and of course, when imports cease, become more tightly locked up than ever. In Kaladgi last August, from closed communications, and the stoppage of cart traffic, men's backs were the sole means of import for a month or two. Considerable panic arose, and grain rose to 5½ lbs. per rupee on the works, notwithstanding that it was a matter of notoriety that enormous stocks, the accumulation of several years, were hoarded away in pits. When I was first there, from rain having fallen grain was at 10 and 11 lbs. per rupee in the local markets. In remarking to some of the most intelligent of the people that these hoarders of grain would lose heavily if they did not soon open their pits, as in a month grain would be at 20 lbs. per rupee, they answered, then, when 20 lbs. is reached they say they will open their pits, as it will be plain that the general opinion is in favour of security in the future.

Any, even the slightest, appearance of interference in the grain trade or of forestalling any great advance of prices is a matter requiring the greatest delicacy and discretion in treatment on the part of the local officers. Still I think there are cases in which the command of a small supply might be of great use in regulating the market prices and preventing panic. When, however, a main line of communication was sure to be open during all weather, I would not interfere in the slightest way with the private trade in grain. Moreover, I would, under any circumstances, do nothing anywhere having the slightest semblance of interference, present or future, in the commencement of a famine, for fear of deterring the full and early development of private trade.

MADRAS.

Madras.

Mr. Longley.—No. There was no occasion for such a measure, as private trade was sufficiently active and the markets were kept fully stocked.

Government interference is inexpedient till private trade becomes too slack, and the high prices ruling fail to induce traders to import and throw grain into the

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Madras.

market to meet the demand. When matters come to this pass, and the market is under-supplied, Government *must* interfere ; but the interference must be confined to—

(1) use of personal influence to induce foreign traders or large firms to undertake the importation of grain.

(2) affording facilities for importation (*a*) by improving communications ; (*b*) by suspension of the *export* duty on grain ; (*c*) by grant of advance to traders willing but unable to embark on such enterprises ; and (*d*) by offering bounties on the quantity of grain imported, &c.

When these measures do not avail in keeping the markets sufficiently stocked, Government must import grain on its own account ; but it must not under-sell either the local or the adjacent markets, as, if this is allowed, it will have the effect of putting down the whole private trade and discourage private enterprise.

Mr. McC. Webster.—No such measure was resorted to in this district. The only conditions under which it would be proper for Government to have recourse to such a step would be in the event of there being absolutely no prospect of private trade supplying the market. This is not a contingency likely to occur in this district.

Rev. Newport.—The question of purchasing grain wholesale and selling it retail at less than market-rates was brought forward by a Government officer in the Salem Famine Relief Committee. I opposed the scheme on the ground that "trading" was not in accordance with the principles on which the Mansion House Fund was distributed. But I believe that, had such a scheme been successfully set on foot, the result would have been very good. At that time it was possible to buy grain at Madras wholesale, and, after paying all charges on it, to sell it at Salem under the market-rates without the loss of a single pie. A combination of merchants, or some other occurrence, had raised the local rates of grain far above those of Madras.

I am not prepared to say that Government should undertake this work. In outlying places far from railways and good roads, there may be occasions when recourse may be justifiably had to such a means, but as a general rule private speculation and mercantile competition will be quite sufficient to meet the difficulty.

Where no grain is to be had at all, the Government is surely bound to get a supply and sell it at whatever price the people can afford to give.

Major Baynes.—I would not advocate this measure as a general one, because then Government would relieve a large number of persons who are in the position to go through a time of high prices; but, as recommended in this section, I would supply grain for sale to recipients of relief on work or on the money-dole, and for use in kitchens, if I could do so more cheaply by importation than by local purchases.

Mr. Hurry Row.—The system of purchasing grain and selling it at or below cost price is bad. It is wrong in theory and injurious to the people in practice. It shuts up all ordinary shops. Wherever a combination among traders is expected, to break it down, it would be necessary to buy grain and sell it at a fair profit to the public. To sell grain at or below cost price is interfering with the market in a most imprudent manner.

MYSORE.

Colonel Sankey.—As I understand it, this question raises the whole issue between the native and European systems of relief, which, whatever our own views on the subject may be, it would appear desirable, indeed essential, to inquire into exhaustively, and decide on dispassionately. The question has also more direct bearing on the case of the late Mysore famine than would at first sight probably be supposed, as, since the transfer of the Province to British management, the theory has been (indeed, rather ostentatiously put forward at times) to govern as nearly as possible on native ideas, in order to facilitate re-transfer to indigenous rule whenever that should become necessary. That re-transfer is soon now to be carried out; and hence the question as to which set of ideas should prevail (or, indeed, possibly should have prevailed) in the management of the Mysore famine, is deserving of attention.

To put the matter concisely, the native plea for assisting the famine-stricken by grain dole or otherwise, without a labour test,* is that the cost is simply that of the food thus temporarily supplied, and that, immediately the trial has passed, society falls back into its old groove, neither better nor worse than it had been before. To the objection that, with such universal and promiscuous charity, widespread demoralisation must be the inevitable result, the reply would probably be, that to suppose such is to exhibit ignorance of caste arrangements and obligations, which render it as totally impossible after, as it was before, a famine for any man to change his special calling, or, however he may wish it, to become a professional beggar, or indeed a waif of any description.

Although I cannot believe this to be a complete answer, after seeing the utter prostration and demoralisation which followed in the track of the kitchens so freely opened all over Mysore, it is only right that the matter from the purely native point of view should be examined and disposed of satisfactorily.

If judged by the lavish outlay† on the notoriously useless public works in all previous famines, and, it is also much to be feared, on much of the work done in suppressing the late famine, the native has unquestionably the best of the argument, judged from a purely financial point of view ; and I trust, when the past and future of the works so carried out have been fully investigated, the evidence will go to strengthen the suggestions I have ventured to make regarding the absolute necessity for a three or four years' Budget programme (as based on the effort which I made in Mysore) to prevent the recurrence of such a reproach.

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* For Kublai Khan's practice in famines, see Chapters XXVII. and XXXI. of Colonel Yule's Marco Polo :—

"From those who have suffered . . . . no taxes are exacted for that year—nay, more, he causes them to be supplied with corn of his own for food and seed . . . . Those who have lost their cattle . . . . not only got scot-free, but get presents of cattle."

. . . .

"You must know that when the Emperor sees that corn is cheap and abundant, he buys up large quantities, and has it stored in all his provinces in great granaries, where it is so well looked after that it will keep for three or four years. And this applies to all kinds of corn, whether wheat, barley, millet, rice, panic, or what not ; and when there is any scarcity, he causes that to be issued."

In a note it is observed that "rice . . . keeps long if care be taken to air it and stir it about ; and although not so good to the taste or look as new rice, it is said to be more wholesome."

Native ideas in India on the subject are sufficiently well illustrated by the following notice, which has just now appeared regarding the distress in Indore :—

"Measures are being adopted by Holkar to alleviate the distress of the people in his dominions. He has opened depôts of grain in different parts of the city of Indore and elsewhere, where wheat is sold at twelve seers per rupee, and where care is taken that the purchaser buys it for an amount not exceeding a rupee at a time during the day. This plan is said to work well, and many people belonging to the Railway, who are not residents of Indore, avail themselves of the advantages of it. Another precaution which his highness has taken to save his people from the pinch of scarcity is to have always a sufficient supply of grain in his dominions ; and this he manages by putting difficulties in the way of exportation. With a view to this, he levies an impost of a rupee for every *mani* (six maunds) of grain that is exported."

† One example will suffice: "*Of the famine roads which in* "*1874 were undertaken in Bengal, about one-half had to be left* "*unbridged and unfinished. These have since fallen into a* "*condition of utter uselessness*" (*see* paragraph 24 of his *Excellency the Viceroy's minute of* 12th August, Famine Blue *Book, No. IV. page 114*).

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MYSORE.

Mr. Ricketts.—I do not know of any conditions under which it would be proper for Government to administer relief by purchasing grain and selling it at or below cost price. This measure was resorted to, not by Government, but by private individuals, but I could not understand what safeguards could be invented for preventing the same individual under the guise of other nominal purchasers making repeated purchases, and thus making a profit out of the transaction. If this abuse could be guarded against, and it might perhaps be prevented by benevolent private persons selling on a small scale, then I think much good might be effected by such a measure as enabling the poor without having recourse to actual charitable appeal, to purchase as much grain as they did before when it was cheaper. It would be highly objectionable, I think, for the Government itself to attempt to organize such a scheme.

QUESTION 34.—PROPORTION OF RECIPIENTS OF RELIEF TO THE WHOLE POPULATION.

Ch. III. Qn.

Section 3.—Miscellaneous.

State as nearly as practicable the proportion that the whole number of persons that were in receipt of relief in any form in your district on a selected day, or on the average of some week, when the recent famine was at its height, bears to the whole population. Of the whole number so receiving relief, what were the proportions under the following heads:—

1. *On relief works* - - - - - -	*Adult males.* *„ females.* *Children.*
2. *Artisans specially employed (if any) as such* -	*Adult males.* *„ females.* *Children.*
3. *In poor-houses (resident)* - - - - -	*Adult males.* *„ females.* *Children.*
4. *Relieved non-resident (paragraph 30)* - - -	*Adult males.* *„ females.* *Children.*
5. *Relieved in villages (paragraph 31)* - - -	*Adult males.* *„ females.* *Children.*
6. *Others, not resident* - - - - - -	*Adult males.* *„ females.* *Children.*

Replies not summarised.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

		Proportion.
Mr. Colvin, Bijnor.—Persons on works and in poor-house.	25,771	3·35 per cent. on the whole population (737,152.)
On relief works.	8,031	31·16
	8,738	33·91
	6,962	27·01
In poor-house.	456	1·77
	843	3·27
	741	2·88

Mr. Sandys, Budaun.—The proportion that the whole number on receipt of relief when recent distress was at its height bore to the total population was eight per mille:—

1. On relief works—	
Adult males - - - -	3 per 1,000
„ females - -	2 „
Children - - -	1 „
2. Artisans - - -	Nil.
3. *In poor-houses—*	
Adult males - - - -	*5 in 10,000*
„ females - - -	*6 „*
Children - - - -	5 „
Heads 4 and 5 - -	Nil.
Six others not resident -	8 in 10,000

This is the per cent. on the total number thus relieved, as the number of adult males, females, and children is not ascertainable from the records kept by the Ujháni municipality.

Mr. Tracy, Moradabad.—During the last week of September 1877 the daily average of persons in receipt of relief was as follows:—

1. On relief works	Adult males	2,106
	„ females	1,511
	Children -	1,729
		5,346
2. In poor-houses	Adult males	138
	„ females	102
	Children -	59
		301

There was no other form of relief. The total daily average on relief was, therefore, 5,647. According to the last census the population of the district of Moradabad was 1,122,437. The proportion of persons in receipt of relief was therefore 5·03 per mille.

Mr. Cornwall, Cawnpore.—The greatest number of people on the relief works in this district was 7,684 in the week ending 31st October 1877:—

	3,858 men.
	3,017 women.
	809 children.
Total	7,684, or ·63 nearly of the whole population of the district.

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NORTH-WESTERN PROVINCES.

Mr. Story, Jalaun.—The proportion the whole number of persons receiving relief in any form, on the average of a week taken in July 1878, bears to the whole population is ·48.

The proportion under the following head is :—

				Total No.	Proportion.
1. On relief works -	Average of week ending 14th July 1878.	Adult.	Males -	512	·12
		„	Females -	800	·20
		„	Children -	471	·12
				1,783	·44
2. Artisans specially employed (if any) as such.	In July 1878 nil.	„	Males -	—	—
		„	Females -	—	—
		„	Children -	—	—
3. In poor-house (resident)	14th July 1878.	„	Males -	36	·01
		„	Females -	95	·02
		„	Children -	44	·01
				175	·04
4. Relieved, non-resident (para. 30).		„	Males -	—	—
		„	Females -	—	—
		„	Children -	—	—
5. Relieved in villages (para. 31).		„	Males -	—	—
		„	Females -	—	—
		„	Children -	—	—
6. Others not resident -		„	Males -	—	—
		„	Females -	—	—
		„	Children -	—	—

Colonel Chamier, Bara Baulei.—On the 7th August 1878 there were on the relief works 10,725 persons. Of this number the proportions were—

Adult males -	- 0·375
„ women - -	- 0·347
Children - -	- 0·240

of the whole population calculated at 1,115,042.

In the two poor-houses on the same day there were—

Adult males - -	- 262
„ females - -	- 470
Children - -	- 320
	1,052

Mr. Blennerhassett, Rae Bareli.—The whole number of persons in receipt of relief in all forms on 11th July was 20,435, being 2·06 on the total population of the district, and 7·58 on the population of the Drigbijaiganj tahsíl, where the famine chiefly occurred.

Of the whole number the proportion under the following heads were :—

		On total population.	On Drigbijaiganj tahsíl.
Relief works	Adult males -	1·97	7·28
	„ females -	2·44	8·92
	Children - -	1·59	5·89
Poor-houses	Adult males -	·09	·36
	„ females -	·11	·43
	Children - -	.02	·08

The distribution between adult males and females in poor-houses is approximate, no exact figures being attainable.

BENGAL.

BENGAL.

Mr. Barlow.—I give for the district of Bhagalpore the nearest information available upon the points asked. The figures are not more than approximately correct.

Bhagalpore district.

Daily average of the fortnight ending 24th July 1874 on relief works.	Total population.	Proportion of the number relieved to the population.
22,115	1,826,290	1 is to 82
Resident and non-resident at Relief Centres and in Poor-houses.		
Daily average for the month ending 24th July 1878.		
854	—	1 is to 2,138
Relieved by other means (non-resident).		
Daily average for the month ending 24th July 1878.		
69,323	—	1 is to 26
Total 92,292	—	1 is to 19

Note.—The proportion that the number relieved bears to the whole population of the district is given as asked. It may, however, be noted that the relief operations were almost exclusively confined to the Soopole and Mudhepoorah subdivisions, the population of which places aggregates 956,833.

Mr. Worsley, Mozufferpore.—In the height of the famine in 1874 the returns received from circle officers did not show the numbers of males, females, and children separately. For the fortnight ending 30th May 1874 the average daily number of labourers employed on relief works in Mozufferpore, Hajeepore, and Tajpore subdivisions was 190,914, and the number of persons receiving charitable relief 12,926. The population of these three subdivisions in 1874 was 2,109,447, so that about 10 per cent. of the population were in receipt of relief.

Mr. Hodgkinson, Sarun.—About the 20th June 1874 there were 237,312 persons in the Sarun district receiving relief—independently of those to whom grain advances were being or had been given. This represents 11·5 per cent. of the total population. I find it impossible to classify the number relieved correctly under the heads given in the question, as information is not available. The following is the nearest approximation I can give :—

1. On relief works -	Adult male	109,328	
	Female -	62,243	
	Children -	46,526	
			218,097

2. Artisans specially employed on such (weavers) - - - - -	3,109
3. In poor-houses receiving cooked food and probably for the most part resident -	1,536
4. Relieved non-resident *purda nasheens* spinning thread (females) - -	4,944
5. Relieved in village - - - -	304
6. Other not resident receiving food (not cooked) - - - - -	8,704
Gratuitously receiving money -	618
Total - - - -	237,312

Mr. Kirkwood.—In Cuttack (1867) the highest numbers were relieved during the middle week in August. The daily average was then very approximately as follows:—

——	Total.	Males.	Females.	Children.
(1.) Earthwork (light labour) (approximately) - - -	6,000	300	4,500	1,200
(2.) Artisans specially employed (weavers) - - -	4,000	4,000	—	—
(3.) In poor-houses (resident and non-resident) - -	9,000	1,500	5,000	2,500
(4.) and (5.) Relieved gratuitously in villages - -	45,000	5,000	25,000	15,000
(6.) Non-residents relieved by spinning - - -	8,000	—	8,000	—
(7.) Orphans relieved in orphanages	870	—	—	870
Total by Relief Agency -	72,870	10,800	42,500	19,570
Add by Public Works Department and Irrigation Company's works	30,000	20,000	7,000	3,000
Total - -	102,870	30,800	49,500	22,570

Add relieved by sales of Government grain about 70,000 persons.

The total of 173,000 persons was, on a population of then about 1,300,000, about 13 per cent. But in 1867 much of the Jajpore subdivision, with a population of 450,000, was comparatively free from distress. If 300,000 is therefore deducted from the distressed population, the percentage would be about 17.

In Bhagalpore district, north of the Ganges, the largest numbers were relieved about the 20th of July 1874. The numbers then were approximately as follows:—

——	Total.	Male.	Female.	Children.
(1.) Light labour earthworks - -	23,000	2,600	15,400	5,000
(2.) Weavers - - -	1,200	1,200	—	—
(3.) In poor-houses (residents) -	700	200	280	220
(4.) and (5.) Relieved gratuitously in villages - -	55,000	10,000	25,000	20,000
(6.) Non-residents relieved by spinning - - -	6,000	—	6,000	—
(7.) Relieved by labour at grain golahs - - -	900	900	—	—
(8.) Public Works Department and Court of Wards - -	25,000	20,000	4,000	1,000
(9.) Private works - -	4,000	2,000	1,500	500
(10.) Grain advances made by Government - - -	80,000	—	—	—
(11.) Grain advances made by Court of Wards - - -	20,000	—	—	—
(12.) Grain sold at Government stores - - -	200,000	—	—	—
Total - -	415,800	—	—	—

This was about 52 per cent. on a distressed population of 800,000, varying from 10 per cent. in the less distressed parts to 80 and 90 per cent. in the more distressed pergunnahs. Without sales and advances the percentage would be about 14 on a population of 800,000. I have elsewhere (chapter II., question 5, and chapter III., question 1) spoken of the percentage relieved in the worst times in Bhagalpore as being 12. But that percentage has reference to the worst three months, and not to any particular day.

These tables, though representing the greatest aggregate total of relieved at any period, do not necessarily represent, and indeed in many cases do not represent, the largest number at any time under each individual relief heading. It was often the case that as the numbers on one relief fell off those on another increased.

Mr. Magrath, Madhobhani.—The reports, as contained in the papers I have with me, are not sufficiently clear to give the full particulars required. I can only give totals—

Population at the commencement of the famine, probably including Nepaulese and other outsiders -	700,000
1. On relief works -	495,000, or ·7 of the population.
2. Artizans - -	Not separately accounted for.
3. 4. 5. 6. Receiving gratuitous relief - - -	46,000, or ·066

In all 541,000, or little less than four-fifths of the population.

The details asked for are not now clearly to be made out; but, from a Public Works return, I find that the proportion of persons employed was nearly three men to two women and one child. The proportion of children is of course extremely small, but by that time a large number of advances had been made, and many of the women and children who would have had to come on the works were saved from doing so. Later on, when the ticket register came on, the proportion of people who received relief at their homes was 14 to 1 who was in the poor-house. Even this does not shew the artizans and the women doing spinning work, nor does it show the number of people who received advances to carry them on.

Mr. Lowis, Dinajpur.—I subjoin the numbers in receipt of relief for the fortnight ending 15th June 1874. The population of the district is about 1,500,000, so that nearly half were on our hands at the height of the famine; the larger proportion, however, being on the works. Even of those under heading 5 a large number was employed in spinning thread, making cloth, &c.; those under heading 1 being only those employed in earthwork, on roads or tanks. The numbers in receipt of real gratuitous relief, for which no return in any shape was exacted, were never great, but they were never shown separately. All relief was divided into two heads; that afforded by the works, where every individual was supposed to earn his day's wages, and charitable relief, where mere subsistence was given, and some return exacted if possible. It should be borne in mind that the women and children were in receipt of daily wages, as were some of the men, such as overseers, those employed in dressing slopes, &c.; but even from those in receipt of daily wages some sort of piecework was exacted. The majority of the men were on task-work, so much money for so many cubical feet earth excavated.

1. On relief works	Adult males 37,787 ,, females 22,843 Children 12,906
2. Artisans - -	None.
3. In poor-houses -	Resident, none.
4. Relieved - -	Non-resident, none.
5. Relieved - -	In villages, 22,460
6. Others - -	Non-resident, none.

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BENGAL.

Mr. Whinfield, Burdwan.—At the beginning of August 1874 we had 65,000 on charitable relief, receiving rations of cooked food, about 5,000 on road works, and probably an equal number employed by persons who had taken advances under the Land Improvement Act; and we had given advances of grain to about 3,500 cultivators. Also we were employing, perhaps, 1,500 artisans and others. I cannot give exact figures, as I have not the full returns by me. The percentage on the whole population (2,035,000) was thus nearly four. The large majority of those fed at the food centres consisted of women and children and sick persons.

BOMBAY.

BOMBAY.

General Wilkins.—Southern Division.

STATEMENT showing the Proportion that the whole Number of Persons in the receipt of Relief on Relief Works on the 9th June 1877, when the Famine was at its height, bears to the whole Population.

No. I.	Public Works.				Civil Agency Works.	Grand Total.	Population.	Proportion bearing to the whole Population.
	Males.	Females.	Children.	Total.				
Kaladgi	25,570	35,109	14,572	75,251	6,821	82,072	816,037	$\frac{1}{9\cdot94}$
Dharwar	21,536	27,303	8,146	56,985	2,037	59,022	988,037	$\frac{1}{16\cdot74}$
Belgaum	10,945	13,607	5,834	30,386	2,332	32,718	938,750	$\frac{1}{28\cdot72}$
Ratnagiri	1,067	762	315	2,144	255	2,399	1,019,136	$\frac{1}{424\cdot81}$
Canara	235	352	109	696	200	896	398,406	$\frac{1}{444\cdot64}$
Kolhapur	2,227	3,699	1,288	7,214	29,911	37,125	1,373,938	$\frac{1}{37\cdot008}$
Sawantwari	—	—	—	—	149	149	190,814	$\frac{1}{1280\cdot63}$
Savanur	—	—	—	—	154	154	15,757	$\frac{1}{102\cdot31}$
	61,580	80,862	30,264	172,676	41,859	214,535	5,740,875	1 to 26

STATEMENT showing the Proportion that the highest Number of Persons on any one day, but not the same Day, in the receipt of Relief on Relief Works in the several Districts, when the Famine was at its height, bears to the whole Population.

No. II.	Dates.	Public Works.				Civil Agency Works.	Grand Total.	Population.	Proportion bearing to the whole Population.
		Males.	Females.	Children.	Total.				
Kaladgi	1877. 11th Aug.	33,801	53,475	21,569	108,845 * 1	13,731	123,277	816,037	$\frac{1}{6\cdot61}$
Dharwar	9th June	21,536	27,303	8,146	56,985 * 5,884	2,037	64,906	988,037	$\frac{1}{15\cdot2}$
Belgaum	12th May	13,425	16,014	6,748	36,187 * 5,651	4,063	45,901	938,750	$\frac{1}{20\cdot45}$
Ratnagiri	3rd Feb.	915	357	145	1,417 * 982	2,345	4,744	1,019,136	$\frac{1}{214\cdot82}$
Canara	19th May	1,455	2,035	701	4,191 * 893	1,549	6,633	398,406	$\frac{1}{60\cdot06}$
Kolhapur	16th June	187	209	175	571	42,709	43,280	1,373,938	$\frac{1}{31\cdot74}$
Sawantwari	16th June	—	—	—	—	291	291	190,814	$\frac{1}{655\cdot72}$
Savanur	21st April	—	—	—	—	746	746	15,757	$\frac{1}{21\cdot12}$
		71,319	99,393	37,484	208,196 * 14,111	67,471	289,778	5,740,875	1 to 20

* These figures show the difference between manuscript and printed statements received by the Superintending Engineer, S. D.

Mr. Propert, Khandesh.—The following numbers are taken for the week ending 25th August 1877, when the number of people receiving relief was at its height. The numbers on civil works were then much larger than at other times during the scarcity, as the emergent work which I had to start near Dhulia (mentioned in para. 7, Chapter III.) was then in full swing. The total numbers clearly show that Khandesh (as I have

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frequently stated) suffered from scarcity, not from famine.

Relief Works.	Public Works Department Agency Persons employed.	Civil Agency Persons employed.
Total	8,312	9,857
Charitable Relief	—	3,256
Grand Total	8,312	13,113

The population of the district may be put down at about one million. The percentage being relieved at the date above mentioned was, therefore, 2 per cent.

Mr. Spry, Kaladgi.—Taking one week (4th August 1877) during the height of the famine, the proportion that the whole number of persons that were in receipt of relief of all descriptions bore to the whole population was just one-fifth. But it must be remembered that very large numbers of persons from foreign states received relief as well as our own people.

Of the whole number seven-tenths were on relief works and in the following proportions:—

Adult males	$\frac{1}{5}$
„ females	$\frac{1}{3}$
Children	$\frac{1}{7}$

The remaining three-tenths were on all other descriptions of relief; but without searching the records of many establishments and offices now finally closed, and the members of which are dispersed all over the country, it would be impossible to give details as asked for concerning them. I can only say that those receiving relief at poor-houses and villages, and specially employed, made up this residue.

QUESTION 35.—EMIGRATION AS A MEASURE OF RELIEF.

Has Government ever attempted to organise emigration, permanent or temporary, from districts suffering from famine to other parts of India or foreign countries as a relief measure? if so, with what success? Under what circumstances could any such emigration be organised or encouraged? To what extent has emigration been resorted to by the people voluntarily? Have any gone beyond sea? Have any permanently gone off to settle in other parts of India? How many (approximately) left their district on a temporary expedition to search for food or employment elsewhere during the recent famine? Did they go alone or with all members of the family, and with their cattle and property? Where did they go to, and were their hopes of alleviating their distress realised? How many (approximately) have not come back, and how many are supposed to have died?

Punjab and North-Western Provinces.—There has been no organized emigration. In 1877–8 a considerable number of people with their families and cattle went to the Terai, Malwa, and the Central Provinces. They mostly returned. The emigration from Gorahhfour to the Colonies in 1878 was double of that in 1877. *See* Capt. Pitcher on Emigration.

Bengal.—In 1873–4 unsuccessful attempts were made to organize emigration from Sawan and Tirhoot to Assam and Burmah. None other is mentioned.

Bombay.—An offer was made by Government to transport people to the Central Provinces, but was not accepted. No other attempt has been made. Voluntary emigration went on largely in the famine to Central India, adjoining districts, the Ghat forests, &c. The result was not very favourable, but the proportion who died is not known.

Madras.—Thirteen European and two Native gentlemen have replied.

The Government do not appear to have organised any system of emigration beyond sea during the recent famine in the Madras Presidency. The return of emigration promoted by the ordinary agencies during the 14 months ending November 1877 shows that with the exception of that to Ceylon the average number was not exceeded. A large number of labourers were moved from Bellary and Cuddapah to the Buckingham Canal, and there were movements of distressed people from district to district.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys, Budaun.—Government has not attempted to organise any emigration from this district, which is not so densely populated as to render it advisable to encourage any such measure.

The office records show that emigration to the following extent only has taken place since the Mutiny:—

Men.	Women.	Children.	Total.	Destination.
156	78	82	316	Demerara.

During the distress in the cold weather of 1877–78 about 4 per cent. of the people of this district left in the hopes of getting a living in the Tarái parganas or on the left bank of the Sarda river. Most of the emigrants took their families, cattle, and property with them, but failed to realise their hopes. It is said that about two-thirds have returned, but there has not been sufficient time to make full inquiries on this or to ascertain what is known as to the fate of the remainder. In fact, the actual number of those who left is conjectural, no census having been taken.

Mr. Lawrence, Agra.—The North-Western Provinces Government has never attempted to organise emigration.

If a famine is not general, but is confined to certain parts of the province, persons might be sent to that portion of the country where prospects are good.

At the time of famine people emigrate voluntarily in great numbers.

I do not think they have gone beyond the seas. Some might have settled in other parts of India. Not more than four or five per cent. left their district in search of food or employment in the recent famine; the majority of them took their families and cattle, if they had any. They wanted to go to Malwa, but their hopes of alleviating their distress were not realised.

Mr. Story, Jalaun.—I am not aware of Government evehaving attempted to organise emigration during times of famine. I think if famine became very severe in places where the population was excessive, a system of emigration to other places wanting in population might be organised with much advantage. It is one of the first signs of famine in these parts

—the people emigrating to more favoured lands. When the pressure of famine is over they mostly return to their homes, but not all, as many are known to have permanently settled in the places they have gone to. None have ever gone beyond the sea that I am aware of. This part of India is so far from the sea coast that the people are not likely to travel so far. From a return made out in October 1877, 36,394 persons and 12,780 cattle left the district temporarily for the south (Central Provinces and Malwa) in search of food and employment; 20,444 persons and 6,196 cattle had returned to their homes by the 15th October 1877. No subsequent returns were made out, but it is believed most of the people who emigrated had returned to their homes by March 1878. I cannot tell how many died, but I should say not many, as the people when they left the district were not as a rule in very distressed circumstances.

Mr. Spedding, Gorakhpur.—No attempt has ever been made to organise emigration from this district as a measure of famine relief. In the event of widespread and general distress likely to be of long duration, my opinion is that a well-organised system of foreign emigration would be one of great value.

The following table gives the total numbers who emigrated from this district from 1864 to July 1878:—

1864	236
1865	393
1867	64
1872	576
1873	2,059
1874	940
1875	768
1876	217
1877	981
1878 (half year)	967

The above emigration has been voluntarily to 10 different colonies. A glance at the figures will show how much the number increased during the years of distress, 1873, 1877, and 1878. No information can be given regarding the numbers who leave the district on temporary expeditions in search of food or employment. The number of such is always large in the north, where the tenants and labouring classes are ready to cross over into Nepal, if they think there is a chance of bettering their condition. Of the number who emigrated to foreign countries about 15 per cent. take their families with them.

Captain Pitcher, Lucknow.—Emigration is left in Oudh in the hands of "recruiters," as they are called, who are under contract apparently to supply a certain number of coolies. These recruiters are seldom natives of the province, being usually men from Bengal. At one time it was my duty, as Assistant Commissioner at Lucknow, to register emigrants, and I took a good deal of interest in the matter, an interest which has never abated.

The crying want of India is capital. Every road whereby capital can be drawn into the country should be carefully watched and made easy in every way possible. Emigration is one of these roads. Thousands of absolute paupers are sent out only to return to their villages richer in many cases than the owner of the whole village. Men who, had they remained, would have swollen the famine death-roll or lived at the expense of Government are by emigration, at no cost whatever to Government, converted into independent men, contributing as employers of labour and spenders of money to a certain degree (however infinitesimal) towards relieving the State burdens.

Yet this road is choked with obstacles from end to end. The system of contracts leads to the recruiters becoming unscrupulous as to how or what manner of recruits are obtained, so long as the stipulated number are collected within a certain time. Unscrupulous proceedings have but too often brought recruiters into collision with the magistracy, and have engendered on the part of district officials very strong prejudices against recruiters and their doings, a feeling which the police have in many instances taken up very bitterly. Then the promises made to the recruits are, I fear, not always carried out, while there are matters connected with their transit to the colonies, and capable of remedy, which, if generally known, would have a deterring effect on emigration. The chief obstacle, however, to emigration on a large scale is the dread of the journey and the absence of referees from whom intending emigrants could obtain trustworthy information.

My attention was first attracted in 1869 to the subject by observing a Bengali wandering about the kutcherry with a mob of wretched-looking creatures; and making inquiries, I found that he had been detained two days waiting the pleasure of some clerk in the office. I obtained permission after that to supervise the registration, and for about two years registered batch after batch to the number of some hundreds, so that I was able to get a fair idea of the class of people who went, and why they went. Almost without exception, men and women were physically of the lowest type in the district, and driven to emigrate through want. They had evidently but a hazy idea as to where they were going. As an instance of the difficulties of the recruiters, I may state that one day, just when a batch of emigrants were ready to start for Calcutta, a native inspector of police went to the recruit barrack and shouted out, "You are all going to be made Christians; those "who wish to return to their homes may go, I give "them leave," and off they all went.

Since 1871, having been employed in other duties, I have not seen much of emigration, but in May last an incident occurred which seems worth recording. During a morning ride I came across a well-to-do looking Brahman walking by a laden bullock cart (driven by his son, a boy some 9 or 10 years of age), and on his way to the city markets. Happening to ask the man a question, I was surprised by receiving a reply in broken English, and entering into conversation I found that the man must have been one of the emigrants registered by me in 1868–69 for Demerara, driven to emigrate, no doubt, by the scarcity of 1868–69. His story was that he left India an absolute pauper, owning (as he himself put it) nothing beyond his Brahmanical string and a wife and family, which latter he left in charge of a neighbouring money-lender; that after five years, on applying for a free return passage, which he had been led by the recruiter to expect (and which when registering emigrants I had also understood to be promised to them), he was told he must pay his own fare. This necessitated his working on another year or so, after which he paid his own way, and arrived at his home after seven years' absence, with about Rs. 700 to the good. Out of this sum he assured me that he paid the money-lender Rs. 500 for the keep of his family during his absence, and with the rest set himself up with cart, bullocks, and implements, and took a lease of some land. Of his prosperity, his personal appearance at a time when want was rampant was sufficient evidence. Pointing to the boy driving the cart, the man said he had left this boy a mere infant, returning to find him strong enough to help at farm work. Adverting to the sum paid for his family, he evidently thought he had paid handsomely, but there was not the least sign of anything like grumbling in what he said; rather, on the contrary, he seemed thoroughly grateful to the man who had so faithfully trusted him during so long an absence. As regards his treatment while an emigrant he appeared thoroughly satisfied and happy, save on two points, on which, however, he seemed to lay little stress. One was that he had not got a free return passage, and the other was that so soon as they left India Brahmans were forced to eat at the same dish with other emigrants of whatever caste. As may be supposed (to those who know village life in Oudh), an inkling of this fact would seriously impede the emigration of all save the very lowest in the social scale, whereas the emigration of strong healthy men, who would earn their capital quickly and return to spend it judiciously, is what should be aimed at.

In 1875 the subject of emigration was under discussion, and I then suggested what I still think would be a most important help to emigration.

If the treatment of emigrants during the voyage or while in the colonies has any objectionable features, we are bound to afford intending emigrants a full knowledge of what those features are; while, on the other hand, if the treatment of emigrants is uniformly good, and there is no serious fault to find, the sooner some of our starving poor are made acquainted with the true facts of the case the better.

To afford the people the best means of obtaining this knowledge I would select intelligent, fairly educated men, one from each district, say, or about 60 in all from the North-Western Provinces and Oudh, place them under some trustworthy officer of the rank of Deputy Collector or Extra Assistant Commissioner, and who from long residence in the country would have a thorough knowledge of the language and customs of the people, and would be able to protect them on the journey, and I would then send them in an ordinary emigrant ship, free of course of all expense, to the colonies which require labour, give them sufficient time to make ample inquiries on all points, and then bring them back to their homes, giving some suitable bounty. After that I would appoint these men as recruiters, allowing so much per head for every healthy recruit. The registration of a recruit should be carried out in the district in which the recruit resides, and no other. The recruiters under this system would travel about in their own districts and take any men willing to emigrate to the tahsíl, where, after identification of the men as *boná fide* district residents by some third party known to the tahsíl officials, their names would be registered.

From time to time, as recruits were required, the Calcutta agent could send to the magistrate of the district a brief statement of the number required and the terms offered, along with a sum sufficient to cover the expenses of the men to Calcutta or elsewhere. The magistrate would inform the district recruiter and fix a date for candidates to appear for medical examination. The recruiter would give his men warning, and the recruits passed would be sent off without further delay. Beyond perhaps a day's food for those attending for examination but failing to pass, all the expense at present incurred of keeping emigrants for days together in barracks would be saved, all the odium of kidnapping and entrapping people under false pretences which the present system labours under would be removed, and the colonies would find their return in the superior class of men obtained.

From one return I observe that "of 414 souls "embarking for India in one ship, 240 adults deposited Rs. 96,000 for transmission to India, besides "a considerable amount of coin and trinklets entrusted to the Surgeon Superintendent's care." Say, in round numbers, that 250 people after a ten years' residence returned with a lakh of rupees, and that each year brought a similar number and a similar sum into each district, can it be doubted that, by the introduction of all this capital, a vast, though gradual, benefit would accrue to the country?

The death-rate may be taken at 30 per thousand per annum, so that, of 350 emigrants leaving the districts for ten years, at least 250 ought to return.

Can any officer with any knowledge of the country assert that each district could not spare 350 emigrants per annum? I, myself, should say that each district could, if necessary, spare 1,000 per annum, particularly when one remembers that after rotation had once set in there would be no actual loss, as the 30 per thousand dying yearly would equally succumb if they remained at home.

To a gentleman who was collecting at Trinidad subscriptions for the Bengal famine, a coolie replied: "If you want more, tell the agent at Calcutta to "send plenty of coolies to Trinidad, where, if they "work, they won't starve."

For 250 men to return with a lakh requires but Rs. 400 per head, while the Brahman I have referred to before brought back nearly double that sum in less than 10 years.

Arguments in favour of emigration frequently meet with opposition from officers who say that India has waste lands of her own, on which such emigrants might be better employed. This would be very true if every emigrant were a small capitalist; but what is the use of talking of the waste lands of India for men without capital? and it is only of the men without capital that I would favour the emigration. My single Bráhman has, I fancy, made more of his venture than Government has made out of the big Charwa jungle scheme.

As to the waste lands of India, no one could be more anxious than I am to see them brought under the plough, but paupers are of no use to that end, and, besides, the country can spare men both for emigration and for waste lands; indeed, the emigration and immigration advocates ought to meet each other half-way.

A very large proportion of the emigrants are tempted by grants of land, &c. to remain in the colonies. A magistrate when despatching emigrants should have the power of being able to promise them a certain number of acres of land rent-free for five or ten years for every Rs. 100 brought back by the emigrant as capital.

There are other points, such as passing letters to and from emigrants free, making the recruiting agent visit the emigrants' families, arranging for family payments, &c., on which I need not enlarge here, as it will be useless doing so until it has been decided to alter the present system.

Captain Currie, Lucknow.—The following number of persons have emigrated during the past four years to the following places:—

—	1874-75.	1875-76.	1876-77.	1877-78.
Demerara	95	236	118	571
Natal	149	43	56	55
Trinidad	54	40	5	255
French West Indies	—	14	—	—
Dutch Guiana	—	—	—	40
Jamaica	—	—	—	72
Grenada	—	—	—	94
St. Lucia	—	—	—	47
Total	298	333	179	1,134

I cannot say without lengthened inquiry how many persons left the district on a temporary expedition to search for food or employment elsewhere during the recent drought, where they went to, or whether they were successful, how many have not come back, nor how many are supposed to have died.

Mr. Quinn, Hardoi.—There is ordinarily no emigration from this district. To encourage emigration simply because a famine is raging is, in my opinion, an expensive way of affording relief. It often, too, inflicts a permanent injury to the district by still further reducing a population already thinned by famine. Emigration should only be encouraged in over-populated districts. As regards voluntary emigration, the famine in this district was not sufficiently severe to induce wholesale emigration. A great number of petty cultivators, farm labourers, and the like left the district. They went singly, leaving their families behind them, as a rule. Some went to relations and members of the biradari living in other

H.III. Qn.35.

North-Western Provinces.

parts of the country, but the bulk of them started on an aimless journey in search of work. I have no statistics as to the number who left the district and the proportion which returned. All meant to return, but a large proportion never did. Immense numbers of cattle were driven off to the tarâi across the Chauka in search of pasture. Although their prospects seemed hopeful enough, yet at least 75 per cent. of the cattle perished. The fear that their cultivators will abandon the village and never return is in this district a strong incentive to the zemindars to aid them to the utmost of their power. The cultivators, being nearly all without rights of occupancy, have no particular tie binding them to their village.

Bengal.

BENGAL.

Mr. Barlow, Bhagalpore.—No attempt of the kind has been made in any districts of this division at the time of or in connection with famine. The preference for home and the prejudice against emigration, founded upon ignorance and fear, which the people manifest at ordinary times, is too strongly developed for any sudden effort to prove successful in the way of making them move. I believe, however, that if the conduct of emigration were undertaken by Government, and efforts were made to teach the people the truth upon the subject; above all, if successful emigrants returned to the localities where they were known, and reported favourably of the "unknown land," emigration would rapidly become popular. A few hundred coolies are annually registered from the districts of Monghyr* and Sonthal Pergunnahs; a few go to the Mauritius. I do not know of people from this part of the country permanently going off to settle in other parts of India. Nothing was remarked or made known regarding people leaving these districts in 1873–74.

Mr. Toynbee, Patna.—The only attempt made hitherto to organise emigration as a measure of relief was that made by the Bengal Government in the famine of 1873–74.

In November and December 1873 attempts were made to collect, in the densely peopled districts of Sarun and Tirhoot, a large number of families willing to emigrate to Assam. The result of these attempts showed that, unless liberal bounties were allowed, and a regular and expensive recruiting staff was maintained, no perceptible relief would be afforded. The attempt was accordingly abandoned. The usual emigration agents employed by planters in the tea districts were unusually active, but no emigration to the tea districts took place which had the remotest effect on the famine. In January 1874 an attempt was made to induce people to emigrate from Bengal to British Burmah. An officer acquainted with emigration affairs was deputed to superintend all the arrangements, and the district officers of Bengal were made his agents to procure emigrants and assist them in starting. The experiment was continued for eight months with the following result: 5,040 persons emigrated to British Burmah at a cost to Government of nearly Rs. 20 per head. Of the above number 3,479 went from Calcutta and adjoining districts, 1,199 from Behar, and 87 from Chota Nagpore. None went from the northern districts of Bengal. As a measure of famine relief, it can hardly be called a success that 5,040 persons only were induced to emigrate from among a population of over 64,600,000 (excluding Assam). The fact is, that the people of Bengal are quite averse to leave their homes even under circumstances of the greatest pressure, and any attempt at State emigration would be quite sure to end in failure. The chief minister of Cooch Behar not long ago attempted, quite in vain, to induce families to emigrate there from Burdwan, his native country, and cultivate excellent virgin soil at low rents. To the majority of the inhabitants of Bengal the village in which they are born is the village in which they die, and they seldom make a longer journey than to the nearest village, *hât*, or market. The extent to which the people of Bengal emigrate of their own accord to Assam, to other tea districts, and to British colonies is at the rate of about 30,000 annually, and only about 20 per cent. of these go from the thickly populated provinces of Behar and Bengal proper. This figure is quite inappreciable in its relation to the total population.

In Orissa in 1866, and in Bengal in 1874, people wandered from their homes to works and relief centres, and to different parts of the country where they had friends or relations able to help them; but no general movement of the people in any particular direction took place in either year, and no record is available of the number who died or never returned. From the experience of the Orissa famine of 1866, or the Bengal famine of 1877, it was clearly evident that, as a rule, the people would rather die near their homes than emigrate, even if State aid be offered. There is a great and national dread of the sea and of the unknown among all Hindus, which, backed up by caste prejudices, seems to be far stronger than the fear of death.

Mr. Marindin, Baxar.—Emigration to the Northern Bengal labour districts and to the colonies has been active upon the poor people of all castes in the Buxar subdivision during the past twelve months, and was undoubtedly induced by the dearness of food.

Mr. Metcalfe.—No system organised has ever been attempted for emigration from Behar, although every encouragement has been given to emigration agents and others to induce people to emigrate to Burma, Assam, and other places where there is a demand for labour. The people are very suspicious of any Government agency for emigration, and besides have a dread of emigration to an unknown place. They always attribute, too, some sort of sinister motive to Government which they do not attribute to the agents of private companies, who are often residents of that part of the country and are accompanied by persons who are returned emigrants. Two emigration roads have been made from Behar joining the somewhat isolated district of Durbhunga with Purneah and Julpigoree; but the real link wanted to encourage emigration is easy communications from Doobree to Goalparah and Gowhatti. I have frequently met gangs of labourers returning from Doobree, who have worked their way so far, but were obliged to return for want of funds. I am unable to say how many people emigrated beyond the sea, but the number must have been comparatively few. Many hundreds of persons permanently left their villages and settled at Purneah, taking with them all the members of their families, together with their cattle and goods. Having left that part of the country, I am unable to say how many of the people have since returned, or whether their hopes were realised.

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* Note.—Coolies registered for Monghyr.

Year.	Under B.C. Act VII. of 1873.	Under India Act VII. of 1871.
1875–76 - -	1,407	185
1876–77 - -	1,822	234
1877–78 - -	2,393	115
Coolies registered for Sonthal Pergunnahs.		
1875–76† - -	78	—
1876–77 - -	625	—
1877–78 - -	1,856	—

† These are for Sudder subdivision only.

CENTRAL PROVINCES.

CENTRAL PROVINCES.

Mr. Nicholls.—It must be borne in mind that several of our districts are so large that there may be a great deal of migration from one part of a district to another, which hardly amounts to emigration. In this way many of the people of the Chandarpur and Phuljhar zemindaris and of the Raigarh and Sarangarh feudatory estates of Sambalpur, went into the Khalsa, or into the southern and eastern zemindaris and states. In the same way it is believed that many persons from the Seorinarain and Hazur tahsils of Bilaspur, and of Simga Tahsil and Lown, went into the Mungeli Tahsil of Bilaspur, and into the Dhamtari Tahsil of Raipur, and into the surrounding zemindaris and feudatory states, without leaving Chhattisgarh proper. It is impossible to say how many or what proportion of them came back to their former villages with the return of prosperity. From the Wainganga rice fields many thousands of people emigrated to Berar. But for some years previously emigration to Berar had been going on steadily from the Nagpur Province. I believe that this emigration began with the demand for unskilled labour in Berar, on the railway works, in a country then sparsely populated, but with a vast quantity of good land lying uncultivated. This was followed by an enormously enhanced demand for cotton. The high prices obtained during the American war for Berar cotton gave the cultivators the necessary capital for greatly extending their cultivation by hired labour paid at high rates. Higher rates for the agricultural labour of weaker bodied and inexperienced hands could be given in Berar than could be afforded in the Central Provinces for strong men, accustomed from childhood to such tasks. This happened at a time when the cost of living began to rise rapidly in the Central Provinces, and told heavily on the town population, and those who were not paid in grain. Moreover, the cheaper fabrics of Manchester now began to successfully compete with the home made cloth, and brought pressure on the spinning and weaving classes. These classes could not compete in our provinces for agriculture employment with the regular agricultural labourers, and so it was fortunate for our provinces, for themselves, and for Berar, that circumstances were favourable for emigration. During 1868 and 1869 the flow of people westward under the pressure of famine was very greatly enhanced, but I cannot give statistics for that year.

BOMBAY.

BOMBAY.

Mr. Norman, Poona.—Government never attempted to organise emigration during the last famine. An offer was made to transport people to the waste lands in the Central Provinces, and no persons could be persuaded to avail themselves of the offer. Voluntary emigration went on to a large extent. Probably, in the worst talukas, a fourth of the whole population left their houses with their wives, families, and cattle for other parts of the country in search of food. Many perished; but the majority returned, having lost all their cattle. None are known to have gone beyond the sea. They wandered into the Nizam's territory, to Central India, and Khandesh. Many went down to Bombay, and a large number betook themselves to the villages on the ghauts, where there was no famine, and where they hoped to find grazing for their cattle. It is impossible to say how many have died. This will not be known until the next census.

Mr. Spry, Kaladgi.—No attempt to promote emigration has ever been made in this district. Emigration could only be organised or encouraged when the resources of the country are not sufficient to provide for the wants of the population, and there appears to be a tendency amongst some of them to move elsewhere. No emigration has been voluntarily resorted to here, either out of the district or beyond sea. I refer, of course, to ordinary times, and not to those who left the district during the famine. I should imagine that not far from 80,000 must have left the district during the recent famine. During the commencement of the famine, when the pressure first began to be felt, there being insufficient fodder for the cattle, a great many took their cattle off to the ghauts in Canara and elsewhere in hopes of finding food for them. In some instances whole families went, in others only a few members went to tend the cattle. At a later period others emigrated with their families in hopes of getting food or employment for themselves. This emigration took place into all the surrounding districts, the Nizam's territories, the Sholapore, Belgaum, and Dharwar collectorates: in fact, wherever the people imagined they would fall in with cheap food and less famine, there they wandered. As regards the people who went to the ghauts with their cattle, they were grievously disappointed. Their cattle died and they themselves were carried off in numbers by jungle fevers. Those, too, who wandered into other districts did not as a rule better themselves, although some may have. I should imagine that half may not have come back, although some do even now. What the mortality may have been amongst the absent ones it is impossible to say.

Mr. Percival, Sholapur.—Emigration from these poor districts is well understood by the people, who yearly go to distant places in numbers proportioned to the badness of the season. Government has nothing to do with it, and would inevitably do harm if it interfered. A vast number went in the famine year, none beyond sea, but all over the Nizam's dominions, where rain had fallen, many to the Berars and the borders of Kandehsh, where food for cattle was obtainable; they spread out, a small number in each village, and obtained a subsistence by working for the inhabitants. They took their families and cattle, but only the very poor entirely deserted their houses. A great many returned in the rainy season of 1877, and many are still returning. They parted with a large proportion of their cattle either by sale or death.

Mr. Ramsay, Nasik.—The only organised emigration was in the case of the Musulman weavers of Yeola and Malegaon. These people are Momins, and came several generations ago from the north-west. Many of these were assisted with money from private sources to return to Hindustan. It is not known what has become of them. Work was found for most of those in need of it, but still large numbers moved off into Khandesh and the territories of the Nizam in search of some employment, leaving in many cases their families behind. Most of these have returned to their homes. I have no means of estimating the numbers of these people.

Mr. A. Wingate.—It was not till I got well to the east of Tasgaon that I found myself in a famine area. Passing from villages noticeably more crowded, I came to villages noticeably empty. The doors of the houses were carefully built up with stone and mud, or plastered with wattle and dab. This condition of things became more and more marked till I got into Jath, where in decent-sized villages (except where there was well cultivation) one had to hunt about to find a house occupied. In one case, I remember, there was only a Patel and a Mhar, that is, the village officer and his messenger, and they were living, with a couple of bullocks, on a scrap of irrigated land.

III. Qn. 35.

BOMBAY.

I was of opinion that, while a noticeable fraction of the Tasgaon population had left their homes, the exodus east of that had been enormous, and upwards of half to two-thirds of the Jath population (60,000) had disappeared. Inquiry told me that the great mass had passed north-eastward to Balaghat, in the Nizam's territory. Every year large bodies of people go to the same quarter to reaping, just as the Irish troop over to England at particular seasons; there was connection kept up, for long afterwards I would meet a stray visitant to his village, who would describe that there were crops in the far country, but that times were very hard.

In Kaladgi I found the people from the south had gone away through the Dharwar district to the ghats.

In June and July large numbers returned, mostly weak and fever-stricken. They gave great trouble, because hardly had village relief been got into some order before a new and worse lot of people appeared. In villages that I knew well and had the village dole list in my pocket book and the people in my memory, I would be dismayed to see a pinched-looking stranger child, following whom I would come upon a miserable family. In several cases I noted down their story. Fever had generally carried off the men; the survivors had struggled back with the hope of the return of rain, and now they had got home they would not move a yard to relief of any kind.

All this migration occurred before mortality had begun, before there was any distress; once hope of a "season" had gone, the whole population was up and divided itself into those who were to go and those who were to stay. Among the latter there was no movement afterwards, except in search of relief. Of the former, very few returned till the rains were near.

This migration relieves the country most distressed and carries the people where grain is more easily procurable. I would not attempt to control it, but I would do two things—(1) for the cattle movement, I would, in anticipation, divide the ghats and jungle into grazing blocks (excluding young plantation), and allot so many head of cattle to each block, and I would from the very first see that the cattle were distributed properly, billeting the herdsmen and their children on the villagers and insisting on their getting accommodation, and, if necessary, providing for their support by an order on the village Bania for so many seers of grain per week. And (2) I would send an officer or two to accompany the great migration of the people wherever it tended, who without interfering would watch, and when they found that the new country could not nourish the new population, they would organize relief measures, and thus prevent disease and death there, and the subsequent return of weakened people to add to the labours of relief in the famine area. I would census the immigrants as far as possible, and having ascertained their numbers and the tracts they come from approximately, as they expressed a wish to return, I would pass them back by published routes.

MADRAS.

MADRAS.

Sir W. R. Robinson.—The inaccurate use of the term "emigration," as applied to a rather wider form of the wild wandering of masses under our late famine conditions, has caused a good deal of misapprehension as well as confusion as to both facts and hopes. It may be broadly stated that there was no increased "emigration," properly so called, during the famine period in South India, such as needs occupy the notice of the Commission.

Below is shown the movement of population across seas during fourteen months of the rise and height of the famine. As regards emigration properly so called —even including the Straits Settlements and Burmah—the fluctuation was unimportant. As regards the casual labor-field of the Tinnevelly and Madura population in Ceylon, it will be observed that about twice the usual number of persons wandered thus far afield in search of food and work, but it was in the main simple wandering as respects this excess. As a rule, labor is searched up by emissaries from Ceylon, and family advances are made to those proceeding from South India to estates in Ceylon; what labor can be fully employed is thus procured. These measures affected the movement of possibly somewhat more than the ordinary average; but the rest left their women and children in the zemindaris of Madura, Tinnevelly, &c., (where the destruction of life has been very great though less known) and simply wandered in a more or less hopeless state to Ceylon, with the inevitable consequence of much loss of life at home and abroad. The causes of this part of South India's famine wandering are obvious, and the Government and planting community of Ceylon bore the unusual and unsought strain bravely; but the consequences both in the homes that were deserted by the bread-winners and to the wanderers themselves turn, I believe, the balance greatly against this form of temporary escape from local distress. I do not think that the thing should be encouraged in famine times.

Statement showing the Number of Emigrants to Ceylon, &c.

—	Number of Emigrants during Fourteen Months ending November 1877.								Average Number during the corresponding Periods of previous Three Years.							
	Ceylon.	Burmah.	Straits Settlements.	Mauritius.	Reunion.	West Indies.	Natal.	Total.	Ceylon.	Burmah.	Straits Settlements.	Mauritius.	Reunion.	West Indies.	Natal.	Total.
Ten months ending 31st July	195,693	3,706	2,506	—	1,560	1,199	—	204,664	87,632	3,648	1,894	791	983	1,132	—	96,080
August - - - - -	30,087	903	606	339	—	—	—	31,935	11,848	798	328	147	78	177	50	13,426
September - - - -	19,315	3,996	196	—	—	—	472	23,979	12,522	5,824	1,599	—	78	55	50	19,158
October - - - - -	12,233	422	283	365	—	442	498	14,876	12,008	597	208	—	78	55	50	12,996
November - - -	7,451	1,232	531	—	—	—	215	9,429	10,596	1,263	—	—	78	460	50	12,447
Total - -	264,779	10,259	4,122	704	1,560	1,641	1,185	284,383	134,606	11,630	4,029	938	1,295	1,879	200	154,107

As respects organised emigration, I do not think Government can satisfactorily enter into this field of action during a temporary famine occurrence. In the first place no district in South India needs relief at this time as respects its ordinary population, or will do so for generations; there is therefore present and future loss by expatriation. And this consideration applies specially where famine is actually decimating

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the existing laboring classes of the country and checking recuperative power.

Organised emigration of large masses is expensive and difficult under any crcumstances, and especially so in comparison with temporary home-administration, while as applied to a famine-stricken, declining and discouraged population is not likely to be successful or beneficial from any point of view. Emigration at the suggestion of authority is apt under the circumstances and in the confusion inseparable from the conditions, to degenerate into coercion, &c., in subordinate hands. Under the (*sic*) condition reluctant expatriation is unlikely to prove a permanent benefit to any country to which the distressed poor may be induced or driven to remove themselves for a time by temporary distress at home. I would put emigration aside as an unlikely expedient for the relief of famine, and not succumb to the temptation to transfer the burden of famine support elsewhere. There is little reason to expect cheerful acceptance.

Mr. Longley.—No special emigration was ever *organised* by Government from this district (Salem) during the famine, either to other parts of India or to foreign countries as a relief measure. Notice was given that favorable rates of labor would be given in Burmah, but none went.

The usual emigration agency was at work for relief coolies for the Mauritius and Bourbon. Between January 1877 and July 1878 two hundred emigrants only were registered.

I am not aware that any persons have left the district during the famine to settle permanently other parts of India.

It is quite impossible to give the number of those who left the district during the famine in search of food and labor; but that very large numbers, especially of the weaver class, did so, before labor for these specialists was provided, is quite certain, but no register of these was kept. They went, as a rule, with the members of their family and did not take their property or cattle, which had been previously sold (except a few cooking utensils), with them.

Mr. McC. Webster.—There is a considerable traffic in labor between this district (Coimbatore) and the Nilgiri Hills and the Wynad, coolies from this district going to works on the coffee and tea plantations. During the last year an unusual number of people left in search of work in those districts, a few were accompanied by their families, several by their wives, but had no other property; many of them obtained labor, many however failed to do so, some died, and others were sent back in an emaciated condition. It is not possible to give particulars of the number of emigrants, how many have returned and how many have died. The trial census taken in March last shows the probable decrease in the population to have been about 18 per cent. Part of this decrease is owing to excessive emigration, but it is not possible to state what portion is due to this cause and what portion to deaths.

Mr. Price.—I am not aware of any such organisation. The only emigration movement attempted by Government was from one district to another. I can form no opinion as to the circumstances under which emigration to other parts of India or foreign countries could be organised or encouraged in times of famine. The people of the interior, three districts of which I know very well, are at all times averse to emigrate. The people did not, during the famine, voluntarily emigrate. It is impossible to say whether any went beyond sea or to other parts of India (out of the presidency). No emigration is recorded as having taken place in this district, nor was any in Cuddapah. If any went the number must have been but small. It is impossible to say how many left their villages temporarily during the famine. In Chingleput the number was very large, amounting to several thousands, and the centre of attraction was Madras. They went both alone—men deserting their wives and children—and they also went in families. They took merely their actual personal property, and if they had cattle left them with others.

Mr. Stokes.—Government have not organised emigration. The Ceylon Government has an emigration agent at Paumben who sent 46,740 laborers to Ceylon last year. Most of these returned. Many whose number cannot be estimated left the poorer parts of the district for Tanjore and other places. It is not known what has become of them. Many of them left their women and children behind. This is said to be particularly the case with laborers who have gone to Penang. None of them took cattle or any property for they had none. Many have already returned from Ceylon, but their number cannot be guessed; nor can the total of persons who have gone to Ceylon be known, as many go by rail to Tuticorin and go across.

Lieut. Henderson.—Yes, in 1877 from Bellary, Cuddapah, and Kurnool Districts to the Buckingham Canal Works, Nellore. The emigration was not a success. On the south of canal 50 miles in length, under my immediate charge, in ordinary years, I could have counted on having about 3,000 coolies at work all the year round; during the famine for months the numbers ranged above 30,000, of which at least 20,000 were volunteers.

MYSORE.

MYSORE.

Colonel Sankey.—My conviction is, that emigration on any sufficiently large scale will be found impracticable from any but the littoral districts of the Peninsula; the inhabitants of which, on the other hand, being those best protected from famine, are the less likely to avail themselves of such an opportunity. For encouraging inter-provincial emigration, please see my remarks on developing the Nuggur *Mulnād*, Section VII. of *printed Collection.*

Mr. Ricketts.—No attempt was made by Government to organize emigration, permanent or temporary, to other parts of India or foreign countries as a temporary measure. Such emigration could only be organized or encouraged to places where there was food, but sparse population. Much time, however, would be occupied in making the necessary preliminary arrangements, and even then I consider that there would be great risks of such emigrants not being duly cared for. There is a small floating population that annually emigrate beyond seas. In 1876–77, 120 persons so emigrated, in 1875–76, 316 persons, and in 1877–78, none. Not that people were unwilling to emigrate, for they would have come forward in large numbers in 1876–77 and 1877–78, but because the emigration depôts at once got filled and the agents stopped recruiting. Thus apparently no help can be looked to from emigration beyond sea (or in fact inland) at famine time. The reason being that only a certain number of emigrants are required yearly, and all sent in excess of that number would not only be a burden to the foreign colonies (if indeed they consented to receive them), but the emigrants themselves would, as a rule, be without work.

No permanent emigration to other parts of India has taken place.

Approximately, about 5,000 or 6,000 people left the district temporarily to search for food or employ-

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ment elsewhere; some went alone and some with their families. They may have taken their valuables, if any, with them, but no cattle or other property. They mostly went towards the Mulnad and Her Majesty's territories, and where some at least found employment. About one-third have not returned and half of this one-third are probably dead.

Gollurs, *i.e.*, shepherds, emigrated with their cattle, and many of these people are known to have died.

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QUESTION 36.—THE CONTROL OF AIMLESS OR MISDIRECTED EMIGRATION.

If famine-stricken people begin to emigrate to a part where it is known they would not find things better than in the country they left, or if they wander aimlessly from their homes, settling nowhere, should steps be taken to stop this, and how? Would you employ the police under any circumstances to turn them back, or to compel them to go to relief-works or poor-houses? or would you let them learn by their own experience? If they crowd into a town, say the head-quarters of the district or the province, would you do anything to stop them on the way or to prevent their begging and straggling about the town when they get there? Refer to para. 25 in answering this question, and add anything that seems requisite in relation to the points now raised.

Punjab.—Would use police to dissuade people from profitless-emigration. Would remove them to relief if they crowded into towns. No legislation required for Punjab as it now is.

North-Western Provinces.—Would stop, or at least discourage, profitless emigration. Would not prevent starving people from the country coming into towns. Opinions differ as to legislation. Some would legislate to enable magistrates to send starving wanderers to poor-houses.

Bengal.—Opinions various. Some do not object to turn back emigrant wanderers by use of the police.

Bombay.—Wanderers should be stopped by the police.

Madras.—Fifteen European and one Native gentlemen have replied.

An almost unanimous opinion is expressed in favour of state intervention to prevent aimless wandering.

Punjab.

PUNJAB.

Mr. Gore Ouseley.—Steps should, it seems to me, be taken to prevent famine-stricken people from emigrating to a part where it is known that they would not find things better than in the country they left, and for preventing such people from wandering aimlessly. Such interference is called for in the interests of the wanderers, and of those who, being themselves pinched by scarcity, would be sufferers by the influx of more mouths to feed. I would employ the police to prevent the onward progress of these people, and to point out to them where relief works and poor-houses were to be found. I would not compel any one to go to a relief work or into a poor-house. If they crowd into a town in such numbers as to create anxiety on account of its sanitary condition, I would eject them and provide a relief work (if such work did not exist in the neighbourhood) for their support. I don't think that any popular discontent would be aroused in the Punjab by this amount of interference with the movements of masses of famine-stricken people. Legislation might be necessary to enable the police to practise even the amount of interference above indicated, if famines on a large scale were to become of frequent recurrence; but in the present state of the rural population in the Punjab, both as regards their comparative immunity from famine and their submission to authority, no legislative measures seem to be required.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—Steps should be taken to stop such emigration, and police might be directed to send in to the magistrates all such emigrants; and magistrates should be empowered, after satisfying themselves that such emigration was intended, to compel them to go to the relief works or poor-houses. Nothing should be done to prevent the distressed among the rural population coming into the towns. It is one of the surest signs that distress is beginning to show itself. But all such persons, if found wandering about without employment or begging, should at once be sent off either to the relief works or to the poor-house.

The great difficulty during the hard times last cold weather was to get those who were suffering from the scarcity to come either to the relief works or to the poor-house, and this difficulty would be only added to if any measures were to be taken to prevent, even if such were possible, those in want either of employment or of food coming to the head-quarters or larger towns.

Mr. Tracy.—Everything should be done to warn them that they were not likely to better themselves, and the disposition to wander should be checked by the timely adoption of measures for relief; but, beyond this, I do not think that it would be advisable to interfere. I would not, under any circumstances, permit the police to turn them back or compel them to go to relief works or poor-houses. The responsibility would be too great. Among a crowd of emigrants there might be many with reasonable chances of bettering themselves by emigration, and it would be practically impossible to discriminate between them and the purposeless wanderers. Other objections are the inability of the police to prevent emigration, if the people are really determined to go, the certainty that the power given them to interfere with travellers would be often exercised unintelligently and not unfrequently abused, and, finally, the illegality in the existing state of the law of the measures indicated in the question. I would not take any direct measure to prevent the famine-stricken from crowding into a town, or from begging when they get there. If they prefer begging to living in a poor-house, or to labour on relief works, I would let them take their chance. It is notorious that the people, as a rule, give food to beggars in preference to subscribing to charitable institutions; and though this form of charity is objectionable, it probably relieves the State of the burden of the support of a large proportion of the famine-stricken. Referring to para. 25, I think that the police should be empowered to take to the nearest poor-house all persons who appear to be actually starving or unable to move about and take care of themselves. Persons in this state should not be allowed any discretion ; they are, in fact, incapable of exercising intelligent volition. The poor-house should invariably be enclosed. This, with a guard at the gate, would ordinarily suffice to detain persons in the above condition. I consider some special legislation for the management of poor-houses highly desirable. If paupers were allowed to come and go as they like, the administration of poor-house relief would be simply impossible. In practice, people who are considered unfit to leave the poor-house are generally detained whether they wish it or not. A short Act to come into force on proclamation by the local government would suffice. It would provide for—1st, the compulsory removal to the nearest poor-house of all persons in such a condition that it is necessary to take charge of them in order to save their lives ; 2nd, it should provide for their medical examination immediately after their admission; 3rd, the magistrate should be empowered to detain them until it is certified by the medical officer that they can leave without danger. I do not know of any special objections to legislation on the subject. I believe that the above, or something like it, is the practice in most poor-houses. I cannot call to mind that I have ever had occasion to compel any one to enter a poor-house, but I have very frequently prevented people from leaving it when satisfied that they were unfit to go. It is advisable that the practice should be legalised.

Mr. Daniell.—If famine-stricken people emigrate, it is obvious that the time of distress has passed onward, and famine has set in. The only emigration, properly so called, which I have witnessed occurred in 1876, when an enormous number of persons passed through the Jhánsi division to the land of promise, Malwa. It was computed, by counting over a number of days and weeks, that so many as 500,000 passed down one road through Jhánsi towards the country beyond the Vindhyas in three months. They carried their families and household goods, taking flocks and herds to some extent. They went mostly from Gwalior, some from Agra, Etáwah, and Dholpur. They had means to support themselves, and eventually the greater number returned after the October rains fell.

I apprehend that generally emigration will set in before famine is established. It is a question how far any interference is advisable to arrest emigration at the earlier stages of distress. If the Government undertakes any system of relief, such relief would be in working order before famine sets in, and before the people are famine-stricken. If the relief from extent and area of famine is unable to meet all demands, persons no doubt will try to seek food beyond the borders of the afflicted tract or country. Prevention of emigration can only be upheld when relief is sufficient to prevent people dying from starvation.

Persons wander about in search of food and employment at an early stage of distress. The fact of such wanderings is one of the indications that relief is advisable, if State relief is to be afforded. With relief works and poor-houses in operation, I do not see that we should take measures, beyond inducement, to arrest the flow.

Mr. Quinn.—I think that emigration in time of famine much needs control. It is attended with terrible mortality, and the emigrants are guided by information always imperfect and often utterly false. The district authorities should be empowered to stop bodies of emigrants. Special legislation is hardly needed. Being debarred from emigration, the people would naturally find their way to the poor-houses and relief camps. The tendency to wholesale emigration will decrease as the people learn that the Government will not let them starve.

BENGAL.

BENGAL.

Mr. Kirkwood.—Whenever famine-stricken people begin to emigrate to a district in which it is known they will find things no better than in the country they leave, or, if they wander aimlessly from their homes, every possible measure should be essayed for turning them back. The most simple would appear to be that police officers should be placed on the main roads to escort them to the nearest relief officer, who would inquire into their cases and put them on that sort of relief, nearest to their homes, which may be most suitable for them. If they find their way into large towns, and beg and wander about the town, they should be put into poor-houses until arrangements can be made for escorting them back to the relief officer of the tract in which they dwell, there to be put on the relief most suitable for them.

BOMBAY.

BOMBAY.

Mr. Hewlett.—I certainly would not allow famine-stricken people to wander about the country. I would compel them to go to relief works or poor-houses. If left alone, they wander till they die. By crowding into a town they disseminate disease, and I should certainly compel them to go to relief works or poor-houses.

Mr. Norman.—If famine-stricken people begin to wander aimlessly about the country they must be stopped by the police, and, as far as possible, forced to go to relief works. Unless this be done, many will undoubtedly perish from starvation on the roads. If they wander into a large town in great numbers a poor-house should be established at that place, and no begging permitted. The arrangement was successfully carried out at Poona last year, when begging was stopped and beggars sent to the poor-house until they could be drafted on to the works. In large towns a committee should be organised, subscriptions collected, as recommended before, for the support of the local poor, the expenditure being carried out under the orders of the local authorities.

Mr. Spry.—Directly there are signs of wandering aimlessly, or of emigrating to places where things are in no better condition than they are in the people's own districts, very much may be done through the village officers, who can be kept informed by the district ones as to where people can go advantageously or where they can find employment or works. It is ignorance of this, and listening to ill-founded rumours, which causes so much wandering. The great majority of these people only require guiding and information, and if that is given widely through all district and village officers, including police, the wanderers will be reduced to persistent and recusant beggars, who can well be allowed to learn from experience.

All wanderers into towns can and should be led off to works or to relief houses adjacent, where relief would be offered to them; but certainly they should not be permitted to wander and struggle about towns,

Bombay.

and thus prove a nuisance to the community. They should be stopped at the gates or other entrances. When they find that they are so prevented they will very soon resort to the proper quarter for relief. It is the chance of picking up indiscriminate charity which leads to demoralisation.

Mr. Gibbs.—With regard to relief measures, the main improvement I wish to suggest is the legislature giving compulsory powers to restrain wanderers and to enforce relief. We need this at the present moment in Bombay to enable us to deport people who have come from Kattiawar attracted here by promiscuous charity, although the chiefs in Kattiawar have started works to employ them. But I refer chiefly to the state of the Deccan, where there are traditional habits of migration. These are to be found chiefly among agricultural labourers of various castes, who have no tie to the land; also some migratory tribes like gipsies. I want an Act which will enable any magistrate to send people found wandering about with no means of subsistence to a relief centre, and, having restored their strength there, to send them on to a relief work and keep them there. This would be quite possible; and if we had had that power during the late famine we should have had much less mortality, as it was chiefly these people who died.

Madras.

MADRAS.

Sir W. R. Robinson.—When famine-stricken people wander, it is because they are unable to get food or work at home or near their homes. There is nothing wanton or wicked in it, and it is the first and only resort of the village starvelings without a poor law provision. The occurrence of wandering further is probably evidence of neglect and maladministration where the wanderers come from. The way to stop wandering—that first object of famine administration—is to rectify and remove these causes; and where the thing has taken place on a large scale and it is known to be hopeless, the proper measures to be taken are to collect and comfort the wretchedness which it represents, and return the sufferers so far as may be to their homes and districts—to well-defined and pre-arranged means of relief. The proper way to effect this is by establishing frequent places of relief and collection on the routes of wandering, and in the towns to which the starving gravitate, and thence to arrange their early relegation to suitable relief elsewhere. The action taken in the town of Madras in this respect affords an excellent model of what should prevail throughout.

Every town must, of course, keep up the means—generally temporary-camps with hospitals attached—of collecting, relieving, and relegating to their homes and districts—for relief or work—the famine-stricken wanderers within their limits. The rest is mere police and municipal arrangement and better be left to that adjustment; of course begging has to be stopped and its necessity removed.

Mr. Longley.—Most assuredly steps should be taken to prevent persons wandering away aimlessly, as no doubt many did during the recent distress, especially to Coimbatore, where matters were very little better than in Salem; and for this purpose I would place a cordon of patrols (police) on the frontiers of the district to turn such aimless wanderers back to organised relief works or to camps, according to the circumstances of the case.

I would have a cordon of patrols (either police or special patrols) round the head-quarters and the principal towns to prevent distressees crowding into them. This course has been adopted with success at the head-quarters (Salem), and the town throughout the famine has been kept fairly clear of destitute wanderers. I am strongly of opinion that (*vide* reply to Question 25) *all* wandering emaciates should be *compelled* (when life appears to be endangered by continued wandering without sufficient food) to go to a relief-camp.

Mr. Price.—Experience would certainly be the best means of teaching the people sense, but this would not only involve the death of very many emigrants but would also cause another evil, viz., the pressing upon the district into which immigration took place a large number of people in addition to those already to be cared for. I would, therefore, in the district from which the emigration occurred give notice, as far as possible, that no work or relief would be, in the other districts, given to strangers. I would, as a temporary attraction, provide works not far removed from the people's homes, and open poor-houses along the main lines of exit. I would then place police on the confines of the district and at any large centres, turn the people back telling them where to get work, and sending in by force to the poor-houses such as were in a badly emaciated or sickly condition; in the neighbouring districts I would employ the police, both ordinary and village, and turn back all wanderers. I would give no work to strangers, and where relief had, to save life, to be given, I would administer it under such circumstances as would make it as unpleasant as possible. I would forcibly deport all wanderers to their own districts and make such a step legal by passing an Act empowering the local government to direct such measures to be carried out. Where paupers crowd into a town, I would stop them by means of the police, and force such as found their way in to go into poor-houses to be placed all around the town, they being thence relegated to their proper taluks. I have nothing to add to what I have said in paragraph 25.

Mr. J. G. Horsfall.—Mr. Sewell remarks: "To let people learn by their own experience means death to a large number of them; and I would certainly use compulsion in such cases not only in compassion to them but in justice to the villages amongst which they would wander. These wandering beggars are an intolerable pest. I would not forcibly turn them back, but would compel them to go to the relief works."

Mysore.

MYSORE.

Mr. Ricketts.—Steps should be taken to stop this aimless wandering. Rest-houses or roadside kitchens should be established, and the wanderers stopped at them and relegated to relief works, and, if possible, in the vicinity of their homes. These wanderers should not be left to learn by their own experience, but turned back by the police. I would use every endeavour to prevent wanderers straggling and begging about the town, and if I knew that there was a complete system of relieving these people in the interior I would adopt such measures as would effectually keep them out.

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QUESTION 37.—REMISSION AND SUSPENSION OF THE LAND REVENUE DEMAND.

Is it a recognised feature of the revenue administration in your district to give relief by the remission or suspension of the demand for land revenue when the crops fail? If there are any established rules, quote them. Is the land revenue assessment based on the principle that profits of good years should cover losses in bad years? Is it assumed that a sufficient margin of profit is left to the landowners to admit of the regular payment of the revenue under all vicissitudes of season, or only in the ordinary fluctuations that occur, excluding seasons of extreme drought? What is the practical state of the case? How far is it found to be possible to collect the land revenue in a year when the crops have totally failed, without pressing unduly on the landowners? What amount of failure of crops is held to justify what amount of leniency in collection? Where the occupier of land pays rent to a landlord, how is the payment of such rent affected by failure of crops, and to what extent does the remission or suspension of land revenue lead to corresponding treatment of rent? What are the arguments in favour of giving relief in the form of remission or suspension respectively? To what extent has it been customary in actual practice in your district or province to remit or to suspend in such cases? Up to what limits do you consider that it is practicable to recover in future years the postponed demand of bad years, or does suspension practically mean remission in all but a few cases?

Punjab.—Remission allowed in case of total failure. Speediest and fullest mode of giving relief. If revenue is remitted to landlords they should remit to tenants.

North-Western Provinces.—Suspension or remission has to be made in case of extensive failure of crops. Both took place in 1877-8. The Board of Revenue is strongly in favour of remission as preferable to relief works, and thinks suspension should be turned into remission on the failure of two consecutive harvests.

Bengal.—Remissions are not contemplated in the terms of the permanent settlement, and it is so light that there is no need of them. Revenue may be suspended on condition that zemindars suspend collection of their rents.

Bombay.—Remissions are not contemplated as part of the revenue system, though they have to be made to some extent in bad years. The general opinion prefers suspension to remission. Suspension not remission is now practised.

Madras.—Remission of the demand is a recognised feature of the revenue administration in case of total failure.

PUNJAB.

PUNJAB.

Mr. Gore Ouseley.—The principle on which the land revenue is assessed is to fix a moderate demand for a long course of years. The Government agrees to relinquish the excess in a good year, and it is fair to expect that the deficiency of a bad year should be made good from the accumulated surplus of past or the anticipated surplus of coming years. But the expectation can be realised only under the ordinary fluctuations of season, and not when an extreme drought prevails for more than one harvest in succession. Where there has been a total failure of the crop, remission is at once allowed. Where the out-turn has been equal to only half the yield of an ordinary season, the Government demand is suspended, and would be recovered in the course of a year or 18 months if the succeeding harvests were good. Smaller failures of harvests would be met by smaller concessions. It must be remembered that, when drought and consequent scarcity of grain occur in one tract of country, they cause higher prices for grain to exist in the neighbouring tracts not similarly afflicted; and that the revenue, being paid in cash, is more easily paid in the tracts not suffering from drought than it would be in seasons of plenty.

Where the occupier of land pays rent to a landlord he is entitled to a suspension or remission of his rent to the amount of the revenue assessed on his land whenever that revenue is suspended or remitted by Government.

The arguments in favour of giving relief in the form of remission of revenue are, that it is the speediest and fullest mode for giving relief. It saves the owner and cultivator from borrowing money to pay the Government demand, and it encourages them to hold on to the land.

It may be as well to state, in illustration of the extent to which remissions and suspensions are granted in seasons of distress, that over 60,000 rupees of revenue were remitted in six districts in 1877-78, and that in 1878-79 over three lakhs of rupees of revenue were suspended from collection in the four districts which were chiefly affected by the failure of their crops. Part of this sum will probably have eventually to be remitted. But this will depend on the nature of the seasons and of the harvests for the next few years.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. A. Colvin.—This is done. It is impossible to collect revenue in a season when crops have *totally* failed. The autumn crops totally failed in this district over nearly its whole area in 1877. Half the revenue was collected without great difficulty; four-fifths of the balance being deferred till the spring collections of 1878, and the balance till the autumn crop of 1878. There is no fixed rule as to amount of failure in crops. It must depend as much on the means of the landlord as on the crop.

Mr. Sandys.—Suspension or remission of the land-revenue demand is granted in case of extensive failure of the crops.

The established rules are laid down in Board of Revenue, North-Western Provinces, circular No. $\frac{4}{\text{II. }710}$, dated 28th June 1876. Profits of good years are supposed to cover losses in bad years, but would not be sufficient if the drought were so extreme that there was complete failure of both the autumn and spring harvests.

The rent-roll prepared at the time of the settlement in 1864-65 was Rs. 20,96,764 and the revenue demand was Rs. 9,28,624, and in 1872-73* the

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* These are the only years for which the figures are obtainable without some delay.

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rent-roll was Rs. 23,37,274, the revenue demand Rs. 10,29,770. As it is notorious that the rent-roll does not give the full value, there is a large margin of profit to admit of the regular payment under all ordinary vicissitudes of season. As there is no record of the entire failure of the crops in both harvests, it is difficult to say what amount of the land revenue could under such circumstances be realised. There are very few wealthy landlords in this district, and, if the crops of both harvests totally failed, a suspension of the total demand due from them would be desirable. Collections could not be made from such landlords without undue pressure, and such pressure would result in the State having to support the greater number, if not the whole, of their tenants. As regards the majority of the zemindars of this district, they are as a rule heavily in debt, and in their case remission of revenue should accompany a total failure of the crops in both harvests, and suspension of demand a failure of one-half the crops in both harvests.

The failure of half the crops in both harvests over more than half the total revenue-paying area would generally justify leniency in collection.

The proportion of his rent paid at each harvest by the occupier of the lands depends, as a rule, on the proportion that has failed of his crop. Rents are usually paid in money, and not in kind, and in a lump sum distributed over each harvest in the same proportion as the Government revenue, but only paid in that proportion if the crops are fairly good ones.

Suspension or remission of land revenue had to be made in the following years since the last settlement:—

In 1877-78—Suspension Rs. 250.—To be recovered in November, and December, 1878.

In 1877-78—Remission Rs. 3,394.

If the estate is lightly assessed, and the total failure of the crops of not more than one harvest has occurred, suspension would be sufficient. If the estate is fully or heavily assessed, and is not free of incumbrances, and the crops in both harvests have totally failed, remission should be made. In the former case the proprietors in this district would ordinarily be able to repay the amount suspended, with the instalments of revenue due from them, at the next harvest or the one following; and in the latter case, though few of the estates are fully assessed, yet a large number are heavily mortgaged. Unless the revenue were remitted, the estate would soon be brought under the hammer by order of either the Civil or Revenue Court.

Since the Mutiny, excluding 1877-78, the following sums have been either remitted or suspended on account of drought:—

In 1860-61—Remission - - Rs. 9,859.
Suspension - Rs. 8,201.

Recovered in March 1862.

If balances cannot be collected by instalments within three years, they should be remitted.

Mr. Lumsden, Rae Bareli.—The principle and rules as to remission or suspension of land revenue recognised in and applicable to the province are of course applicable to this division, and it would seem quite superfluous for me to give them in detail. There are not, I believe, any hard and fast rules governing such matters; it is a recognised principle, however, that extraordinary and exceptional losses from failure of crops, whether caused by drought, hail, or inundation, call for exceptional measures of relief in the way of suspension or remission of the land revenue, and the practice has been, I believe, to deal with each case on its own merits.

No doubt the principle of our assessments is that the profits of good years should cover losses in bad years, for in the old form of settlement engagements special mention was made of the fact that any loss from drought, hail, &c. would not be held to entitle the zemindars to any consideration; this, however, has been omitted from the forms of engagements now prescribed for adoption in the North-Western Provinces. I am not, however, aware that its omission is attributable to any departure from the rule that our assessments are based on the principle that the profits in good years should cover losses in bad; perhaps the omission was rather attributable to the fact that, notwithstanding this principle, it was the practice in exceptional cases to grant remissions or suspensions, and it was, therefore, absurd to retain such a special stipulation in our settlement engagements.

Notwithstanding the principle that profits in good years should cover all losses in bad years, there can be no doubt that owing to the absence of forethought, and the spendthrift habits of the majority of the agricultural classes and the hand-to-mouth manner in which they live, laying aside nothing for a rainy day, the profits left in good years are not sufficient to meet the losses incurred in seasons of extraordinary drought, and that, except in the case of a small minority, the payment of the Government demand in such years cannot be met without incurring debt. In other words, in practice, the margin of profit appears to be sufficient only to cover losses attributable to the ordinary fluctuations that occur, and not such losses as result from seasons of extreme and extraordinary drought.

No doubt, if a larger sum were taken from the landholders in good seasons when they had it to pay and a lesser sum in bad or indifferent seasons, the aggregate realisations in a series of years, after making allowance for remission and suspension, would even exceed the sum now collected; and as the money would be taken when the people had it to pay, I have no doubt the higher amount even would be realised with less risk than there now is of recourse being had to the mahájan to meet the Government demand. I do not, however, consider that a system under which the Government demand for the year would depend on the nature of the season—seasons being classified according to actual results, to be ascertained and determined annually—would work well. Such a system would, in my opinion, be altogether a retrograde step: it would introduce an element of uncertainty which could not but have the effect of checking the investment of capital and the expenditure of labour in effecting improvements, and the annual inquiry which would be necessary under such a system would open a door to much fraud and prove an incentive to dishonesty; our present establishments would be unable to undertake the work efficiently; and the zemindars would have to incur expenses which it is unnecessary to allude to, and which while so far reducing their profits would in no way benefit Government.

In fact, all the benefits resulting from a fixation of the Government demand for a certain period would be sacrificed.

Instead of adopting any such system, I would suggest for consideration whether it would not be better, in making our assessments for a fixed term, to recognise the fact that the margin of profit left to the landholders under existing rules of assessment is not sufficient to admit of the regular payment of the revenue under all vicissitudes of season, but that at the same time it is more than sufficient for this purpose with reference to all the ordinary fluctuations of season; and accordingly to fix the State's demand at a higher percentage of the assets than is now taken, declaring at the same time that in seasons of extraordinary drought suitable remissions would be granted.

Under such a system the necessity of annual or periodical inquiries would be avoided, and all the disadvantages inseparable from any system under which the Government demand is liable to alteration every year, even although the limit of such fluctuations be fixed, would be got rid of. The system would, I am convinced, be more popular with the landholders, and Government would at the same time be in a position, without sacrificing its revenue, to make liberal remissions in seasons of extreme and extraordinary drought—a measure which, if it could be carried out without sacrificing revenue, would greatly reduce the difficulties now felt in carrying out other measures of relief in times of famine.

It is not possible to collect the land revenue in a year when the crops have totally failed without pressing unduly on the landowners, except, indeed, in the case of the few who have accumulated capital, invested or uninvested, from which they can meet the demand.

As far as I am aware, there is no fixed rule that a certain amount of failure of crops justifies a certain degree of leniency.

My own experience is to the effect that except in the case of cultivators who abscond or die without leaving any property, or are absolutely reduced to pauperism, landowners in the case of all others eventually recoup themselves for what they have suspended in seasons of extraordinary drought.

In my opinion, any suspension or remission of the Government demand should, as a matter of course, involve a proportionate suspension or remission by the landholder of the tenant's rent. There is, however, this difficulty in connection with this matter, that some individual cultivators are often in a position to pay up in full, while the circumstances of others call for even greater concessions than the amount of land revenue suspended or remitted to the zemindar would entitle them. What should be insisted on is, that the zemindar in the aggregate grants suspension or remissions of rent proportionate to the remission or suspension of land revenue allowed him by Government.

I am certainly of opinion that more real assistance and relief is afforded by moderate remissions than by suspensions of heavier amount. The argument in favour of suspension, however, is of course that the Government demand represents the State's fair share of the annual assets over a series of years, bad and good taken together; and that in case of failure in any one year the zemindar should pay from the excess profits of good years, and that the most he can expect is some grace to enable him to meet the demand. Another argument in favour of suspensions rather than remissions is that in famine times, when such concessions are called for, the financial resources of Government are always taxed to the utmost, and any serious actual loss of revenue such as remissions on any considerable scale involve can ill be borne by the State. I do not consider that suspension practically means remission in all but a few cases.

A great deal, however, will depend on the nature of the assessment and the circumstances of the villages. It is impossible to give a general answer to a question of this sort. Our assessments do not all fall with equal incidence, nor do they secure for Government a uniformly equal share in the zemindar's gross assets. Every division has its highly assessed district, every district its highly assessed pargana. The converse of this is also true. Moreover there are districts, or at least parganas or tahsili subdivisions, in which the proprietary body are very numerous, whose landed property has been minutely subdivided, and almost the whole of the land is the home-farm of the proprietary body, cultivated by themselves with the assistance of hired labour. On these and other matters will it depend to what extent suspension can be realised in future years. Where the assessment is light, the realisation of the postponed demand of bad years will be comparatively easy, and a larger proportion of the demand may be suspended without jeopardising its ultimate recovery than in a highly assessed tract. In a pargana, the estates of which are generally held by a numerous body of small proprietors who themselves cultivate the land, it will be found extremely difficult to realise the postponed demand of bad years, even if the assessment is comparatively light and the amount suspended moderate.

Under ordinary circumstances, and if a general answer must be given, I should say that, with our present assessments, one-third of the demand, if suspended, could be realised without much hardship in from two to four years, provided these were years of average prosperity.

Mr. Neale, Hamirpur.—The working of the present system of revenue administration in a time of drought may be illustrated by the following facts. Last autumn, at the time of sowing the spring harvest, I visited the most distressed portions of this district. The condition of the cultivators and small proprietors, who habitually live from hand to mouth, was as follows:—their autumn seed had perished; they had no seed for the ensuing harvest; they had no present crop wherewith to meet the instalment of revenue then due; they had no store of food for subsistence till the next harvest; they had no fodder for their cattle; and many of their cattle had positively died; finally, nearly all of them were in debt already. I represented these facts through the collector to the Commissioner, suggesting large advances of seed. I also, from my own observation, made an estimate of the fair amount of revenue which could be collected for that harvest, taking into account the private resources of some of the wealthier landowners. In one pargana I put this amount at $2\frac{1}{2}$ annas in every rupee, and in another pargana at 4 annas. But the orders of the Supreme Government were strict. Advances for seed were to be limited only to those who could get no advances from any other source, and every pie of the revenue was to be collected if possible. These orders, were, of course, obeyed. About 10 to 12 annas in the rupee were collected for the autumn instalment. The balance, all but about 5 per cent., was collected at the spring harvest, which, however, proved a comparative failure, being probably only about a three-fourths crop. In the meantime, the people lived upon what the baniyas would advance them, eking out their resources by berries, grasses, and by the unripe ears of the spring crops as soon as even these appeared above ground. They did not complain, they never expected the Government demand to be remitted; but they did expect it to be partially suspended till better times. The amount of suffering and of debt and bondage which this method of administration has entailed it would be difficult to estimate. But our system accepts it all as a matter of course, and, in fact, cares for none of these things. Yet, on the other hand, once a certain point is reached, it is lavish of relief, which is apt to run into license and to get beyond legitimate control.

I would suggest a change of system which, if found practicable, might, I think, to a certain extent forearm both people and Government against similar calamities, and unite both for mutual self-preservation.

The fault at present seems to be that Government will not aid the cultivators itself, shrinking from such an undertaking for financial reasons; nor will it permit the monied classes, the bankers, money-lenders, and others to step in as landlords, a change which it equally dreads for political reasons. The result is that, broadly speaking, nearly the whole agricultural class is in a condition of distress and decay. I would propose a system of advances for seed by Government on the twofold security of the crop to be sown and of the proprietary title in the estate or recognised division of the estate (thoke, patti, &c.), comprising the land in respect of which the advance was made; the interest charged to be at the rate ruling for ordinary transactions in this country, viz., 12 per cent. when Government should be the creditor. But when Government guaranteed loans on the above security from other sources, the interest to be 13 per cent., the additional 1 per cent. to cover Government expenses. I would also propose suspensions of revenue on a regulated scale proportioned to the vicissitudes of the harvest.

A primary objection will be raised that this proposal is an interference with the landlord's rights. I do not think so. The *zamindar* always was, and is now, merely a middleman who is allowed the handsome proportion of half profits; and the existing modifications of our settlement principles have been made in the hope that he would improve the condition of land and of his tenantry. In both of these respects he has failed. It is time, therefore, for the supreme landlord to interpose.

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The following is a brief sketch of the method by which the above proposals might be worked.

(*a.*) *The amount of these advances;* not to exceed $\frac{1}{8}$th or $\frac{1}{10}$th of the average gross produce of the estate or division of the estate concerned. Applications to be made through the headmen of the village (lumberdars, &c.) on behalf of the cultivators, when the former refused to forward an application, the cultivator himself to apply, and the case to be dealt with on its merits.

(*b.*) *Tenants to be aided*; should be persons holding at not less than a three years' lease. The present law appears to provide against such leaseholders becoming, *ipso facto*, hereditary occupants. Care should be taken to assure zamindars that in granting such leases they are not curtailing their own rights, which would remain unaffected on the expiry of the lease.

(*c.*) *Recovery of advances*—this to be considered both principal and interest, as the first charge on the estate, and to be ordinarily payable within one year. The land revenue to be the second charge.

(*d.*) *Recovery of land revenue*—to be liable in bad seasons to a rateable suspension, with this *proviso*, that within a period of five years from the date of the first suspension all suspensions should be paid up. This is on the supposition that there are not likely to be ten bad harvests running. A limit to indulgencies is necessary at some point.

(*e.*) *Scale of suspensions of land revenue*—might be graduated to the out-turn of the harvest, an equal suspension of rent accompanying it. Calculating a full harvest at 16 annas, say, when the harvest fell to 12 annas, then a suspension of $\frac{1}{10}$th; when to 8 annas, a suspension of $\frac{1}{5}$th of the land revenue; and so on, till the point of absolute drought be reached, when express measures would be required.

(*f.*) *In seasons of drought or famine* the same process should be extended, and at the same time modified. Advances should be made for subsistence as well as for seed, but at half rates, on the express understanding that the zamindars should maintain their cultivators and the village population generally to the utmost of their means within their respective villages, repaying the loans advanced them for this purpose as an extended date.

(*g.*) *Union of villages.*—I would recommend for the purpose of carrying out the above plan, that villages should be grouped in twos or threes, not to share responsibility, but so that the more active or intelligent communities might advise and stimulate the more backward; and also to enable information as to the real state of affairs in each to be more accessible.

A multitude of objections and difficulties naturally presents itself against this proposal—the present indebtedness of the people; their habitually suspicious attitude towards Government, the opposition of the richer zamindars, and a host of administrative obstacles into the bargain. But by trying at first with small beginnings, these might, I believe, be in time surmounted. The main difficulty would be with that class of landholders whom it is generally thought most desirable to encourage and maintain, viz., the small coparcenary cultivating zamindars. But with these, as with the rest of the cultivating community, when they understood that they could get advances at fair rates, and that allowance would be made for bad seasons, they would, it is to be hoped, prove manageable. A large portion of the other classes of zamindars would themselves require no help. They would not refuse Government aid for their tenants on the condition of enjoying indulgencies themselves in bad years.

The effect of this system would be not so much to employ Government funds, though under the circumstances, this would not prove, I think, unremunerative, but to employ local capital at fair rates, and to protect the needy cultivators from the present usurious practices of the baniyas.

The plan is already familiar in the procedure of the Opium Department; and the Lucknow branch, at all events, of the Bank of Bengal, advances yearly large sums to the talukdars of Oudh. In both cases the results have been satisfactory. All district officers must have met with instances where fair-dealing and intelligent capitalists having bought estates are now managing them with conspicuous success. They get more rent, they show better cultivation, and they pay a higher revenue than their neighbours, simply because they foster and at the same time energize their tenants. Why should not Government, through its local officers, stand, in some measure, in the place of such capitalists?

The interest earned would cover the expenses incurred. In each village a special writer or registrar should be placed, distinct from the patwári, whose time is already occupied overmuch. This person should keep the accounts; also a list of ploughs, cattle, and the hired labouring staff of the village, and a yearly return or estimate of the produce of the estate. Such details, combined with the loan accounts, would put Government in possession of accurate information as to the real condition of the population, a subject on which at present nothing, or next to nothing, is known. Of course, an increase to the collector's district staff would also be necessary; for that also sufficient funds would be forthcoming. At present, schemes for land improvement and for ordinary advances (takávi) fall flat. The cultivators and the landlords are suspicious, and there are long previous palavers with forms, securities, &c., to be filled in, which disgust and alarm the proposed recipient. This should be avoided. The simple fact of the advance should be understood to hypothecate the crop, and ultimately the landowner's title. In time, supposing the system to work well, the cultivator or farmer would learn to take advances for improvements, which he should have on the same easy terms as at present. In fact, the district authorities would be in a position in many cases to exercise judicious pressure and induce him to accept such offers. Again, the inter-union of villages might ultimately lead to the formation of some sort of humble tribunal which could dispose of local cases connected with petty loans for land purposes and similar small revenue cases—a revival, in fact, of village *panchayets*. Express legislation would be required to set such a system as the above in motion, and not only that, but a complete change of attitude on the part of the Government towards the whole question. The idea that by long settlements and relaxed terms the mass of the agriculturists is benefited, and that regular payments to Government are thus made easy, has proved delusive. The persons benefited are the big land speculators and the little money-lenders. If Government wishes to save the cultivating community it must descend to their level and work with them, give them confidence, and to a certain extent share their risks. That it would do so at a loss I do not believe, because the interest and extortion to which the cultivator now submits is probably at least four times what Government would demand from him, and still he pays it. Why should he not pay less, but pay to Government, and benefit himself and the State by the difference?

In a time of famine this habit of co-operation with Government would be found of the greatest service. It would be wise in such seasons to remit, absolutely, a part on the whole of the instalment of revenue—to lend, of course, on very low terms, and, if need be, partly to give funds for the maintenance of each village. But this advantage would be gained,—that these funds would be administered through the agency of the zamindars, who would be interested in economizing, instead of distributed by contractors and strangers. A *residuum* of the surplus population in each village, the mere hangers on, and the most destitute would, of course, congregate unavoidably at relief works, but their numbers ought to thus become far less than at present. And experience under the proposed system, as it accumulated, together with the information gathered for each village, as above described, ought to enable Government to check each community's proceedings, and to insist upon the zamindars maintaining at home a fair proportion of their people, according to their means and legitimate borrowing power.

Mr. Cadell.—I am looked upon as a monomaniac by the Board on account of the persistency with which, as each Bánda pargana is assessed, I state my views that our revenue administration has ruined the proprietary classes all over the country by the rigidity of our system of revenue collection even more than by the severity of our assessments. But the more I see and hear, not only of Bánda, but of the country generally, the more I am convinced that, where irrigation is not general, or where the people are not peculiarly thrifty, as, for example, in the tract 20 miles to the south of Roorkee, which was formerly wholly unirrigated, even half-asset assessments, collected as our assessments are, with little or no regard to seasons, will break down the average proprietary community.

In 1876, I implored the Board to allow the experiment to be tried in one pargana (Maudha of Hamírpur) in the following terms:—

"It would be unsafe to assume that in future our revenue administration will be more considerate than it has been in the past; and it is, I think, necessary that some plan should be devised which may give the people a chance of fair treatment, irrespective of the views of the officers who may happen to administer the affairs of the district. The difficulty is to fix a standard by which prosperity shall be judged, and until recently this difficulty might have been held to render any proposal such as I have to make impracticable. But with a minute and fairly accurate classification of soils, and with village papers compiled with a degree of care unknown formerly in this part of the country, the rent-roll may fairly be accepted as correct, and may guide the proceedings of the collector. Cultivation by proprietors might be rated as that of ex-proprietary tenants, and this would allow of an additional margin in the villages in which it would be most likely to be required."

"And the system which I would follow is this:—I would allow the proprietors the full enjoyment of a clear profit to the extent of 50 per cent. of the Government demand; any surplus I would divide between Government and the proprietor, the additional sum collected by Government to be credited to the village, and to be utilized in case during settlement reductions are required.

"In this way, supposing the demand of a village to be fixed at Rs. 1,000, the 10 per cent. cess, patwáris' and lambardars' fees, and village expenses might bring up the total sum leviable to Rs. 1,250. Whenever the rent-roll exceeded Rs. 1,750, Government would be entitled to share the surplus; or, for facility of account, it might be arranged that, when the rent-roll exceeded stated sums, Government should collect an extra half anna or anna in the rupee. On this system the increments might be—

Rent-rate.	*Annas in the rupee.*	*Amount.*
Rs. 1,820	½	Rs. 31–4
„ 1,880	1	„ 62–8
„ 2,000	2	„ 123 & so on.

"Such excessive rent-rolls (as Rs. 2,000 to Rs. 2,600) are by no means unusual in Bundelkhand, and not a few villages in Bánda, which are now on the brink of ruin, show within the last 10 years fairly accurate rent-rolls three times the amount of revenue. Under the present system this surplus is spent by the people, and when distress comes, no attention is paid by Government officials, in a great measure, no doubt, because it is so hard to collect arrears when they have once been suspended. If there were a surplus at the credit of the village, there would be less hesitation in granting reductions, and the good years might be made, as they clearly ought to be made, to pay for the end.

"In allowing reductions, a similar system might be followed to that proposed as the method for levying additional revenue. When the rental fell below Rs. 1,400 (when there was no money in the treasury at the credit of the village, or Rs. 1,500 when there were funds to its credit), reductions might be allowed to be made good from the amount at credit or from future collections as the case might be."—*Paras. 130 and 131, Maudha Rent-Rate Report.*

There are, of course, objections to be urged, some of which I have stated in the report and in the subsequent correspondence, but I do not think that any objections can balance the urgent reason for some change, and that is, that our revenue administration, as hitherto conducted, has ruined more or less fully every district in Bundelkhand within 20 years of our acquiring it. You might think that, if this is the case, there can be no proprietary communities left to maintain. This would have been literally the case had not, some 50 years ago, the collector and settlement officer of the day, Mr. Begbie, sold up every purchaser who was in difficulties, and given back the estates to the old proprietors, and had not Sir William Muir got Mayne to adopt the same policy of restoring the old proprietors in a number of estates confiscated after the Mutiny. Where Mr. Begbie's measures did not prevail, and where Mayne did not restore the land to the old communities, there are hardly any proprietary communities left. This is especially the case in the old pargana of Kalinjar, which I am at present inspecting. Here, too, we have not the insufficient excuse that we cannot successfully administer districts in which the black soils prevail, for they do not form a larger proportion of the area than the alluvial soils of most tracts. The people are industrious, and I know no tract in which so much has been made of naturally poor soil. Population is efficiently distributed in numerous hamlets, cultivation is most careful, embankments are to be found by hundreds in every village, and heavy as our assessments have sometimes been, the majority of the old proprietors have been ruined by the rigidity of our system of collections.

And in the black soil parganas it has been proved that half-asset assessments are not enough. Three or four years of heavy rainfall reduce the cultivated area by one-half or three-fourths. Our revenue system is unflinching. We force the landlords to be equally stern or we take their places, and the populous flourishing village of the census in 1872 is half deserted in 1876, and the people, when wiser counsels begin to prevail temporarily, have to be got back from the Native States and the Central Provinces.

But independently of its absolute necessity in Bundelkhand, an alteration of our revenue system in the way I have proposed in detail, and which has so often been more generally suggested, would furnish all over the country the greatest assistance in years of difficulty. My experience of famine is limited to that of 1868–69 in Muzaffarnagar, in which the distress was so little that I was able to make the necessary suspensions of revenue in three-fourths of the district in a couple of months. But I saw enough of the difficulties of not very flourishing dry villages to be able to estimate the value of suspension of the demand. The zamindar had not to press his people, the day-labouring class got work, and were able to tide over the hard times. But suspensions are not always permitted, and in order to ensure their being allowed, system must be introduced. A few good seasons would give the Government a considerable sum in hand, and the villages, with a fair margin to their credit, would meet a drought ready for it and with one great difficulty removed.

The people made no difficulty with reference to my proposed innovation in Maudha. They saw, I think, that it would be a help on the whole; but I have never been able to get any final orders on the subject, and I have omitted the stipulation from engagements in other parganas.

I see you are taking up Jhánsi. I have never been able to study the subject in all its details, but I am not convinced that the settlement is free from blame. Rates for the best black soils are more uniform in

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Bundelkhand than elsewhere, and those assumed in Jhánsi without any very scientific inquiry are very high. Another point to be considered in a Bundelkhand settlement is the assumed area of cultivation. I could point to village after village in this district in which the assessments have broken down, not because the rates were high or the people indolent or even unlucky, or the seasons bad, but simply because the late officer chanced to come across the village at a time when, very probably after a period of depression, cultivation had been rapidly extended. There are villages in which the area under cultivation amounted in 1842 to 95 per cent. of the assessable area, whereas in 1876 it stood at 50 to 60, and in which I assume as a permanent standard only about 70. Of course I may be wrong, and my assumptions of a fair standard may prove to be more or less erroneous, but the facts which guided the Settlement Officer in 1842 have been proved to be exceptional, and the assessments based upon them to be impracticable.

To make a fair settlement for Bundelkhand you must have fair areas as well as fair rates. The necessity of allowing safe margins of areas does not at first strike a man fresh from the Doab. In Bánda I have been forced to assess on assumed areas largely in excess of the cultivated areas recorded, but greatly less than those of last settlement. In this pargana, in which there is hardly any fallow, I shall probably have to allow a margin in excess of that which I find; but this pargana differs as much from the ordinary black soil in Bundelkhand pargana as it does from the Doab.

I have never been able to complete my answers to the famine questions, and my experience of droughts is so small that I have little on that head to say. I agree entirely with Buck that our great mistake in canal-irrigated tracts was settling on the basis of existing assets, instead of excluding the canal from our calculations, and leaving its revenue administration independent of our assessments. In dry tracts the great want is a more elastic revenue system, and without it, I am convinced that the large reductions of revenue, which are now for the third time within 50 years being given in Bánda, will fail to secure the country from those recurring periods of depression, which, caused sometimes by drought, but more frequently by successive years of excessive rainfall, constantly throw back Bundelkhand, and have now left it on the whole less prosperous than when we took possession of the country.

If I can help you with any local information please let me know, and I will endeavour to make up for my neglect of the famine questions. I have nearly got to the end of my inspection, and when I shall have completed the fiscal history of Bánda, which is more than half done, the most absorbing portion of my work will be at an end.

Mr. Blennerhassett, Rae Bareli.—It is not presumed that landlords can, as a rule, pay revenue in seasons of severe drought. They clearly cannot do so. Landowners are supposed to bear all ordinary fluctuations that occur, and, as a general rule, they can do so, especially if their land is good. The Government settlement, as a rule, is rather hard on bad lands, though less so in this district than in others.

The landlord can give just as much or as little of the Government remission to his tenants as he pleases; they are nearly all tenants-at-will, and even though a Government official records remissions in favour of tenants in the village accountant's books, and with every possible precaution, the landlord can and does, if he chooses to do so, realise the full rent, and no tenant dares to complain.

In Oudh, therefore, there is little hope of Government remission ever reaching the mass of the cultivators, and the arguments in favour of this course are much weakened in consequence.

The remissions and suspensions for the last three years have been as follows:—

	Remitted. Rs.	a.	p.	Suspended.
1874–75 - -	536	6	6	- - Nil.
1875–76 - -	505	13	2	- - Nil.
1876–77 - -	4,052	4	0	- - Nil.
Rs.	5,094	7	8	

Suspended revenue is almost always suspended merely for a time and subsequently realised, unless it is granted with a view to revision of demand. Remissions, in general, are not liberal enough. Many villages are ruined for years by a single hailstorm; it is, however, useless to give remissions nominally to tenants, but in reality to landlords only; both small landowners and tenants are unable to stand any substantial loss to their crops; they have nothing to fall back on; the only point in their favour is that nature is so prolific that a state of affairs injurious to one crop is sometimes beneficial to another.

The Board of Revenue.—Remission or suspension of the demand for land revenue when the crops fail is provided for by section 23, Act XVIII., 1873, and the rules under it contained in Board's circular $\frac{4}{\text{II. 710}}$, dated 28th June 1876, (page 25, II. Board's Extant Circulars). But these rules are not suited to any extensive failure of crops, and no attempt has been made to apply them to the tracts where nothing could be grown during the late drought. If a hailstorm or a calamity of any kind affecting a comparatively small area occur remission or suspension may be granted under the rules, but should the crops of a whole district fail nothing is done, and the relief which is given to the few is denied to the many, who may be equally, or even more, in want of it. It appears to the Board that this is an anomaly which should be removed, and that rules for suspension or remission are required, adapted to a failure of crops on the most extensive scale. It should be remembered that in famine seasons the loss to zemindars and cultivators is far greater than that of Government, even supposing the whole of its demand to remain uncollected, and the Board believe that by a judicious policy of not enforcing payment of the land revenue, where the people have not sufficient to pay and to support themselves afterwards, the evil effects of bad seasons may be most effectually and economically counteracted. They cannot consider it wise to extract money from the impoverished agriculturist only to have to spend it again in the shape of relief works, with all the expensive machinery required for their supervision. These, as stated before, they look on with the greatest disfavour, and if remissions were promptly and liberally granted the necessity for opening them in agricultural districts would, the Board believe, be to a very great extent diminished. A reference to the Famine Reports in the hands of the Commission will show to what extent remissions were granted in former famines, *e.g.*, 1863–64, when they were given with great success, and the Board regret more in this way was not done on the present occasion, as probably less expenditure would have been incurred in the end. The question, however, is a difficult one, and it was only natural that collectors who were aware of the financial difficulties of Government should hesitate to make proposals which at first sight would appear to increase them. In principle the land revenue is supposed to be fixed at an amount which leaves a sufficient margin of profit to the landholder to admit of its regular payment under all vicissitudes of seasons, but practically it can only be realised in good years. It is impossible to lay down exactly the amount of failure of crops which should justify leniency in collection. Each case must be decided on its merit, and according to the circumstances of the landholder. There would be no hardships caused by insisting on payment from a wealthy capitalist, when to do so might utterly ruin a struggling zemindar. Remission of rent, corresponding to remission of revenue, is provided for by section 23, Act XVIII., 1873, referred to before.

As regards the question of remission or suspension, the Board are of opinion the latter should in all cases be temporary only, and for short periods, not extending over more than two harvests. Otherwise the future is discounted, and the people are perpetually harassed. If, therefore, there is no reasonable prospect of realising the suspended demand for the next two harvests, the Board would prefer remission at once, as suspension, even if granted, would almost certainly end in remission, without any of the good effects which might have resulted from it in the first instance.

NORTH-WESTERN PROVINCES.

BENGAL.

BENGAL.

Mr. Barlow, Bhagulpore.—We have the permanent settlement in this part of the country, and by law there is neither remission nor suspension of the land-revenue demand when the crops fail. Practically, the assessment fixed at the decennial settlement bears such a small proportion to the real income in case of the majority of estates that it is no hardship to compel payment in the case even of extremely bad seasons. Assuming a year in which, owing to calamity, any estate makes no collections, yet considering the small amount (comparatively) of the annual demand, the continuous prosperity, and good credit which the owner enjoys by virtue of his proprietorship under Government, it is not unreasonable to require him to make good his land revenue. As regards the possibility of collecting the land revenue in a bad year, the sale law completely secures this, and in 1873–74 I do not think that there were more defaulters than in ordinary years. By circular order the Government gave authority to all district officers to refrain from the application of any coercive process to recover the land-revenue demand for the kists falling in January, March, and June 1874, in case of zemindars who might distinguish themselves by employing labour, &c. or showing charity during the famine. Recourse to the rule was not, however, found necessary. I certainly, as regards the landowners in this part of the country, should not begin to think of leniency in enforcing payment of the land revenue until the second year of very severe famine, if even then. As regards payment of rent during bad seasons, I know that a large amount remains outstanding. This is accounted for by the inability of rapacious landlords to squeeze the money out of a poor class of tenants, as well as by the forbearance of the better class of landlords. In a very few and remarkable instances the demand of a notoriously bad year like 1873–74 is remitted by the landlord, but as a rule the arrears are recovered. According to system here, all payments by ryots are credited to the demand longest outstanding. Thus a zemindar may be behindhand with the collections of his current demand, but his arrears are usually low.

Mr. Toynbee.—The land revenue of Bengal (excepting Orissa) is permanently fixed, and it is not a part of the revenue system to grant remission of revenue on account of failure of crops. Considering how enormously the value of land and of produce has increased since the permanent settlement, such a course is quite unnecessary, and practically it is found that the deficits of a bad year are easily made good from the surplus of the next.

In Orissa about 4½ lakhs of rupees were absolutely remitted on account of the famine, and 11¼ lakhs conditionally suspended, which have not been, and will not be, collected—in, all about 15¾ lakhs out of a demand of about 17½ lakhs. For the famine of 1874, only Rs. 28,957 was remitted on account of Government revenue—Rs. 28,649 in the Sonthal Pergunnahs and Rs. 308 in Singbhoom.

The landlords in Bengal have taken full advantage of the enormous increase in the value of produce, which advantage is denied to the Government by the permanent settlement. The rents paid by the ryots generally are proportionate to the present value of the produce of the land: the revenue paid by the landlord to Government is out of all proportion. The latter can therefore afford to pay his Government revenue in almost any year, however great the failure of crop. He can borrow the money on the security of his estate, if he has not got it in his pocket. The ryot, on the other hand, has nothing but his crop from which to pay the landlord. No crop means no rent: the landlord, therefore, has no interest in killing the goose which lays for him the golden eggs.

In Bengal absolute remission of revenue is quite unnecessary, considering the lightness of the Government demand: approximately it is only about one-third of the gross rental, as returned under the Road Cess Act. Temporary suspension might be necessary in cases where there is only (say) a 4-anna crop; in no conceivable case would it be necessary in future to convert suspension practically into remission. The case of Orissa in 1866 was quite an exceptional case, which would not possibly recur in any part of Bengal.

Mr. Finucane.—Suspension of the demand for land revenue was granted in Dinagepore in 1874 only in the case of zemindars who assisted their ryots, who suspended their rent collections, and who co-operated with the local authorities. The Government revenue assessment on the Alapur pergunnah of the Durbhunga district is Rs. 1,810 (eighteen hundred and ten rupees); the gross rental is about four lakhs of rupees, or more than two hundred times the Government revenue; the Government expenditure and famine relief in this pergunnah was in 1874 at least two and a half laks, or considerably more than the total revenue Government derived from the pergunnah from the time of the permanent settlement up to date. I think it evident that, in the case of districts so lightly assessed as most of the permanently settled districts of Bengal are, not only should remissions of Government revenue not be granted, but the burden of maintaining rural populations in years of distress should be thrown upon the zemindars, and so localised that each individual zemindar would have to pay for the maintenance of all cultivators resident on his estate who were unable to maintain themselves. With a 6-anna crop in Durbhunga, State relief would not be at all required, if zemindars did not press for rents. If zemindars did press for rents, in the case supposed, the great bulk of the ryots being obliged to sell their crops, and having, as a rule, little or no savings to fall back upon, would be ultimately obliged to come on State relief works for support. If the demand for Government revenue were suspended in such years, and the realisation of rents were prohibited, little or no State relief would be required, and if any relief were required the option might be given to zemindars of either making, each in his own estate, such arrangements as might be necessary for the maintenance of his distressed tenantry, or of having such arrangements made for him by the district officer. Sums so spent by the district collector should be realisable from the estate as a public demand. The necessity for direct famine taxes would thus be obviated, the strongest inducements towards the improvement of estates and taking precautionary measures against effects of droughts would be held out to both ryots and zemindars, and the latter would have no shadow of reason for saying that the terms of the permanent settlement were not most strictly adhered to. I would merely suspend, and not remit, the Government revenue demand, and would therefore

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BENGAL.

only ask the zemindar to suspend, and not to remit, his rent demand. On this plan a good zemindar having a prosperous tenantry would suffer little from famine, while an oppressive proprietor, with an impoverished tenantry, would have to pay the penalty of his own misdoings.

Baboo Hari Mohan Chandra.—During the famine of 1874 the land revenue of 61 estates, to the aggregate amount of Rs. 1,00,530 out of the total land revenue of Rs. 17,00,000, was suspended from six months to two years. I consider that when there is a famine it is absolutely necessary to give relief by suspension of revenue, as otherwise the zemindars are sure to press their ryots for rents, which must necessarily aggravate their distress, specially among the poorer classes of the ryots. The profits of the zemindars and tenure-holders of this district are 38 and 8 per cent. of the gross valuation of the district, the Government revenue being 54 per cent.

BOMBAY.

BOMBAY.

Mr. Norman.—It is not a recognised feature of the revenue administration of this district to give remissions, &c. when crops fail. The assessment is, in theory, based on the assumption that the profits in good years should cover losses in bad years. Practically, in those talukas in which the rainfall is precarious, the poorer class of cultivators after a bad season have the greatest difficulty in meeting the demands of Government. The land they hold is of the worst and poorest description, and, though in a good season it yields sufficient to leave a fair margin of profit to the cultivator, in a bad season the yield is absolutely nothing. In practice it has often been found necessary to grant remissions, though this is opposed to the principles of the revenue survey. A subtenant of land usually pays his rent in kind, half the produce being the ordinary amount. Hence he is not so much affected by a bad season, except that his labour goes for nought and his profits are insufficient for the support of his family. As a general rule, I am in favour of suspension instead of absolute remissions. I think the custom of granting remissions in case of failure would cause an unnecessary loss to Government. It often happens that a year of failure is followed by a bumper crop, and in that case, unless the failure were very severe, there would be no great difficulty in recovering the greater portion of the Government demands. I am, however, averse to suspending the collection of the revenue for more than one season. If it has been proved the people cannot pay the outstanding balances in addition to the current year's revenue, the whole of the former should be remitted. In this district, the following remissions have been granted during the last five years, owing to failure of crops:—

Name of Taluka.	1872–73.	1873–74.	1874–75.	1875–76.	1876–77.
	Rs.	Rs.	Rs.	Rs.	Rs.
Junnar	103	8,233	1,087	453	None.
Indapur	—	578	5,782	14,230	
Khed	5,016	21,590	2,677	62	
Serur	187	26,399	4,217	182	
Purandhar	—	2,225	80	—	
Bhimthari	18	65,000	16,572	19,141	
Haveli	—	51,421	9,766	594	
Mawal	144	2,511	434	143	
Total	5,468	1,77,957	40,615	34,805	

Suspension does not practically mean remission in ordinary times. In this district, 1875–76 was a bad year, 1876–77 a year of famine, and 1877–78 was also a bad season. In 1875–76 Rs. 34,805 were remitted. In 1876–77 no remissions were granted, and the outstanding balances held over amounted to Rs. 4,56,827. Had 1877–78 been a good year, most of the above would have been collected. As it was, the balances for 1876–77 still amount to Rs. 4,11,514, which is practically irrecoverable. The outstanding balances for the current year amount to Rs. 67,902. If next season should prove favourable nearly the whole will be collected.

Mr. Spry.—It is generally understood that, where the survey has been introduced, remissions or suspensions of the demand for land revenue, when the crops fail, are not to be given. There are no established rules on the subject, nevertheless cases do occur when such have been given. For instance, in the Ahmednagar district in 1872, when there had been a great failure of crops in certain parts, the poorest class of cultivators were allowed remissions to the extent of annas 4 in the rupee, whilst another annas 4 were kept in suspension till the year following. The land-revenue assessments are based on the average of several years, taking good, bad, and indifferent together. I do not think that any exception was ever intended as regards years of extreme drought. That I take to be the principle; but in some parts of the country, for instance in the Ahmednagar collectorate (where I have served several years), the agricultural classes are so impoverished that, be the assessment ever so low, they could not pay up in full in really bad years. Hence practically the principle could not be carried out. The Southern Maratha country, wherein the Kaladgi collectorate is chiefly situated, has a Canarese population, who are more thrifty and better off than the Marathas. In 1876 the crops, so to speak, totally failed, there not being more than 6 pies in the rupee in the Collectorate, containing an area of 5,695 square miles. Out of a land revenue of 12¾ lacs of rupees, 5¼ lacs were collected during the year, leaving a balance outstanding of 7½ lacs. This balance, together with the revenue for 1877–78, amounted to 20¼ lacs of rupees for collection, no remissions having been given. During the revenue year which expired on the 31st July 1878 16¼ lacs were collected, thus leaving only a balance of 4 lacs of rupees due for the two years. This revenue was collected with but little distress and sale of property, and then only in the case of recusant well-to-do people. The above is an illustration of how far it is possible to collect land revenue without undue pressure in this district, but it does not follow that the same could be done elsewhere.

It is impossible to lay down any hard and fast rule as to what amount of failure would justify a certain amount of leniency. That must depend upon the ever-varying circumstances of individual years, and upon the general condition of the district. As a broad rule the well-to-do should be made to pay, and leniency only extended to those whose means of subsistence and of earning their livelihood in the future would be crippled by payment.

When an occupier of land pays rent to a landlord, the payment of that rent is affected by failure of crops just in the same way as the payment of assessment to Government is. It is impossible to say whether a remission or suspension of land revenue leads to a corresponding treatment of rent, because the latter rests with the landlord and the former with Government.

Provided the assessments are fixed at reasonable rates based upon the average of years, I am as a general rule quite opposed to remissions. I do not see why a ryot should pay less in a bad year when he pays no more during a bumper year; besides, a partial failure of crops does not necessarily mean so much loss to the cultivator, because in all probability

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as in the present year in this district) the amount produced would fetch such a price as to equal what is realised in a year when crops are plentiful but prices low. The practice of giving remissions, moreover, does much harm, as it demoralises the ryot, who, thinking that Government will take the burden off his shoulders, becomes careless in his cultivation and clamours for remissions on the slightest excuse. Further, the hope of getting remissions makes many hold back from paying their instalments.

There are, however, exceptional cases where remissions must and should be given; such, for instance, as in districts where the body of cultivators are greatly impoverished. Also in the cases of Bheels and such like wandering tribes, whom it is an object to get to settle down, but who would be driven away by any Government debt being made to hang over their heads.

I am much more in favour of granting suspensions in cases where pressure would lead to hardship. Suspension of revenue does not demoralise, because it is known that the money must be paid sooner or later.

I think that the postponed demands of bad years should be collected by the end of the second year. Anything that cannot be collected by then probably never can be, and should be written off. Suspension, as far as my experience goes, certainly does not practically mean remission. I think that very much can be collected by it without hardship.

Mr. Ramsay.—The Bombay assessments have been pitched generally low, with a view to meet the accidents of the seasons as they come. Thus, in principle, no remission is to be granted even in a bad year, as one good season is supposed to compensate for one or even more bad seasons. But in practice this is not found to work so smoothly as might be wished. Owing to his improvident habits, a ryot has nothing over at the end of a good year, and the next, if unfavourable, finds him destitute of resources, and he is driven to the money-lender. Hitherto, as far as my experience goes in Deccan districts, there always has been some remission given every year for failure of some crop or other. During the past two years remissions have been discouraged and the system of postponement introduced. The system being quite new, we cannot well yet say how it will work. My own opinion, however, briefly, is as follows:—

However light the Government demand, there will always be a large number of persons in difficulties as to their rent when a bad year comes. Relief to some extent has to be given. In the cases of the more substantial cultivators who have large holdings, irrigate their land, and have a fair amount of stock, postponement of revenue is feasible, *i.e.*, there is every prospect that the arrears will be recovered. With the poorer ryots I think that postponement is illusive and unsatisfactory. It is like hanging a stone round their necks which they cannot get rid of. Some remission must be given to this class, or else they should be sold up and allowed to descend into the class of labourers. But to postpone revenue without much prospect of ever recovering it is worse than idle, for it works actual mischief.

Colonel Anderson.—The land-revenue assessment is based on the principle that good and bad years must be taken together, and that remissions are not necessary, and practically it will be found that, for a long series of twenty or more years in most unfertile talukas with most precarious climate and uncertain rainfall, neither remissions nor outstandings of any but the most imperceptible amount have occurred in any year. These last remarks refer to parts of the Belgaum, Sattara, and Kaladgi Collectorates. In Dharwar, though in parts the rainfall is more uncertain than in others, no part can be called unfertile or of very precarious rainfall. Last year, which was a special one, some small amount was remitted before the policy of granting postponement instead of remission was adopted, and a considerable sum was left outstanding, of which much has been collected.

No specific rule has ever been laid down as to what amount of failure justifies leniency in collection, for the simple fact that, since the first settlement, remissions have become practically unknown.

We have in the south of Bombay no landlord class; some land is doubtless sublet commonly on metayer rates.

The arguments in favour of remission and suspension relatively are as follows:—

If the settlement is on a proper and moderate base, bad years should be compensated by good; and, except under the exceptional circumstances of a series of bad years, remissions should not be necessary, though suspension may be an expedient concession to the people, ease them materially for the time, and cause no ultimate loss to the State except that of interest.

Remissions are bad, in that once given, the people get to hope that they will be again given. Moreover, a system avowedly involving remissions is more to the advantage of the native officials than of any other class. It is impossible in the thousands of applications for remissions, when such are a part of the system, for any proper and trustworthy check to be exercised. The main check must rest in the hands of native officials, who, all experience shows, are not to be trusted in such matters. In one way or another, by corrupt means, more money is taken out of the taluka than is foregone on the Government account. Thus the Government and the ryot lose, and the people and officials are demoralised. In the old system in the Deccan and Southern Maratta Country before the settlement, the revenue system received from the Mahrattas was one of a high unattainable nominal demand from which a portion was always remitted, partly by permanent remissions given before the cultivation of the year, and partly by casual remissions given at the Jamabandi on plea of failure of crops and for other causes. Crop inspections were always made previous to the Jamabandi, and on the results of this inspection the collections were made. Every pretext was resorted to for obtaining remission—deaths in family, house burnt, cattle died, &c. Let the European Assistant Collector, in charge perhaps of from 1,200 to 1,800 square miles, do what he might, it was an impossibility for him to keep up any personal effective check upon the detailed inquiries preparatory to remissions. Officers did exert themselves to effect what they could in this direction, but the more they tried the more they found that any approach to effective control was impossible.

No specific limit for recovering in future years can be laid down. Much must depend upon whether the years following that of suspensions are good or otherwise. But the year or two following a famine must necessarily be years of high prices; if the seasons are only reasonably good, therefore, little revenue should be entirely lost.

MADRAS.

Madras.

Mr. Longley.—Yes. Remission of the full assessment on irrigated lands, under ryotwari settlement is granted when the land is left waste, or when the crop is totally lost owing to either deficiency or excess of water, provided that such deficiency or excess has not been occasioned by laches of the owners of such lands. Suspension of the demand is not a recognised feature of the Madras Revenue adminstration, though in the present famine the issue of coercive process for the collection of revenue was suspended for a few months except in the case of well-to-do-persons.

A small deduction, 20 and 15 per cent., in the case of dry lands and a reduction of the rates fixed for the several groups in the case of wet lands were made from the ascertained gross produce in fixing the assessment of 1871 to cover ordinary fluctuations in the yield; but these deductions were not intended to meet losses occurring in seasons of extraordinary drought, &c., and scarcity. This applies to lands under ryotwar settlement.

It is assumed that a sufficient margin is left to the yotwari landholders to admit of payment of regular assessment of revenue only in ordinary fluctuations, but not in seasons of extreme drought.

The practical state of the case confirms the above assumption.

There has been no *total* failure of crops within the last thirty years, but there was a partial failure in some years. In the present famine the yield in 1875-76 was about 6 annas, in 1876-77 2 to 3 annas, and in 1877-78 about 4 or 5 annas, the consequence of which was that most of the petty puttadars paying revenue under Rupees 30, and a portion of those under Rupees 50, became extremely impoverished, so much so, that a great number of them either found admittance into relief-camps or on famine works, and a number left their homes for other districts in the hopes of bettering themselves; and it may well be supposed that a portion of these have succumbed to starvation. As these petty landholders form the bulk* of the ryotwar puttadars in this district, the collection of the revenue due by them is hopeless.

The above remark applies to the case of puttadars whose *sole means of livelihood is agriculture.* In the case of puttadars who have some other occupations besides, the revenue was collected with great difficulty. A number of them are persons of middling circumstances who have been reduced to extreme poverty or to the level of other petty puttadars owing to prolonged continuance of the famine.

All petty zemindars and other landholders were obliged to borrow money to meet Government demand, as neither class could expect much in such times—the former from his ryots and the latter from his lands. The collection, therefore, in the case of these proprietors was enforced with some difficulty, and they are still in arrears to a large extent.

There is no fixed rule laid down. Most of the landholders paying under Rupees 30, as also a portion of those under Rupees 50 generally supplement their income from land by wages earned by ordinary labor, &c. In times of distress resulting from a general failure of crops labor is not procurable. The consequence is that they fall back on State relief for maintenance. In such cases a rigid collection of revenue from landholders of this description would be undesirable; for they will be compelled to dispose of their *all* for what it will fetch, and such sales would not (with land and cattle depreciated in the market) meet the Government demand, but would simply ruin the cultivator, whilst relaxation in collection or total remission would probably enable these poor cultivators to continue as such. I would therefore propose in future, when the yield of dry lands is between 6 and 8 annas, the collection be suspended for two years and when it is between 3 and 6, a portion, and when less than 2 annas, the whole of assessment be remitted. In the case of landholders paying Rupees 50 and upwards a suspension of a portion of their kists is desirable for, say, a year.

Where the occupant is hopelessly insolvent, the rent must be foregone; but where the ryot is merely impoverished, and there is still hope of his solvency, the landlord requires them to execute a bond to pay the rent at some future period. But it is very doubtful if payment will be made according to the bond Landlords, as a rule, would make no concession to their ryots in consideration of the suspension of the land-revenue by *Government;* but such suspension would certainly relieve the landlord to some extent, as he would be in difficulties because of the non-payment of rents by his ryots. This remark applies to the case of zemindari landholders.

In the case of ryotwari landholders holding directly from Government, who have let their lands to others, the tenants do not pay them when there is a failure of crops.

In the case of wet lands the whole assessment is remitted in all years when there has been no crop or a total failure of crop. If dry crops fail to a large extent, as in times of extreme drought, portion of assessment in the form of percentage is remitted in proportion to the failure. There has been no suspension allowed.

It will not be possible to recover in future years the postponed demand of bad years, if any, except in the cases in which suspension has been recommended above, for a year to puttadars of some little substance.

Mr. Crole.—It is a recognised feature of the revenue administration in this (settled) district (Kurnool) to give relief by the remission of the demand when the crops fail utterly.' *Vide* Board's Standing Circular, No. 137-1.

The assessment on dry lands is fixed so as to cover ordinary fluctuations only. In regard to irrigated land there is no charge when Government supplies no water.

The demand is suspended on a general failure, but the well-to-do ryots can always pay, and there is no ground for the assertion that suspension of the demand is equivalent to its remission. It is being disproved, at this moment, by the active collection of the arrears of revenues as settled at the last two Jamabandies, and it is extremely unlikely that any but a small proportion of the postponed demand will have to be written off as irrecoverable. In the cases in which such a course may be found necessary, the cause will nearly always be found to have arisen owing to a mistake in the Jamabandi officer in having brought to demand the assessment of land which, under the rules, should have been properly remitted.

The Madras revenue system can hardly be improved on in the above respects.

Mr. Stokes.—It is a recognised feature of the revenue administration in the district to give relief by remission when the crops fail. The rule for remission is as follows :—

> " I.—Remission of the full assessment on irrigation land will be granted when the land is less waste, or when the crop is totally lose, owing either to deficiency or excess of water, provided that such excess or deficiency has not been occasioned by any act or neglect of the persons to whom the land belongs.
>
> II.—In districts which have not been settled by the settlement department partial remission of the assessment on irrigated land will be granted when partial loss of crops is occasioned either by excess or deficiency of water, and such excess or deficiency has not been occasioned by any act or neglect of the persons to whom the land belongs.
>
> In granting this remission no attempt is to be made to estimate individual losses. Excluding fields which have borne a fair crop, as also occupied and unoccupied waste land, the ayacut of each irrigation work under which crops have been lost must be considered by itself. The condition of a sufficient number of the fields which have suffered must be examined and the demand in all the fields that have suffered must be reduced by the percentage thus calculated.
>
> When under similar circumstances dry crops are cultivated on wet land which must otherwise have remained waste, only the highest dry rate of the village should be charged.

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* Total number of puttadars	188,809
Puttadars paying under Rupees 10	142,495
Puttadars paying between Rupees 10 and 30	40,393

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> III.—No remission of assessment on unirrigated land will be granted except in very exceptional years or under very exceptional circumstances, and with the sanction of the Board, which must be applied for before the end of January.
>
> This remission will ordinarily be granted without any inquiry into individual losses, as a percentage reduction on the demand of the tract of punjah which has suffered proportionate to the total loss in that tract.
>
> IV.—In all cases where remission is granted, refunds of remitted amounts already paid may be made under Standing Orders Nos. 341 and 341-2.
>
> V.—These rules are to be strictly enforced, and no remissions of assessment are to be granted except in accordance with them."

Mr. J. G. Horsfall.—Clause 7.—The rent is very seldom foregone where the occupier pays rent to a landlord. The landlord does not, however, as is the case with Government, turn out his tenant in case of failure. The rent is carried on from year to year, and is recouped with interest in favorable years.

Clause 8.—With regard to ryotwari lands the present system seems advisable. The assessment has been calculated and fixed upon the average outturn of several seasons—good, bad, and indifferent,—leaving out, however, such seasons as a famine year. In extraordinary years consequently extraordinary relief measures are needed. The ryot lives upon the produce of his land, but that *is* all, and his savings will not, as a rule, enable him to meet a succession of adverse seasons. Our present system is a little harsh in one respect,—failure to meet a single instalment is followed by the attachment and sale of the personal and real property of the defaulter, resulting in a loss to Government. The zemindari system of allowing the excess in good years to be made to meet the default in bad years might with advantage be adopted to some extent. Such a procedure would lead to large outstanding balances appearing in our accounts at the end of the year. I do not see, however, that this is of vital importance.

Clause 10.—In a famine year remission is positively required, because, as stated above, the assessment has been fixed upon the average yield of the land. I see no reason to doubt, however, that excluding a famine year, the assessment could be collected in subsequent years were a system of suspending collections in ordinary adverse seasons introduced. The system has been practised in zemindaris from time immemorial. In the Nuzvid estate now under the Court of Wards, I find arrears still in the accounts of over thirty years' standing, and yet not considered irrecoverable.

Mr. Martin.—I consider that remission is a mistake altogether. Our assessment is at present exceedingly light, and fosters a number of pauper proprietors who speculate on some days of idleness if their crops are good, and on remission if they are bad. Those men who have a real interest in their soil will always take up enough land to live by, and give themselves a margin which may tide them over a bad year, but they may not be able to pay their revenue in all cases without great hardship. Suspension to such persons is a great boon, and the revenue is perfectly safe with them.

I do not think that more than 5 per cent. of revenue suspended is virtually remitted.

The people pay in every case what they can, and when they cannot pay they either emigrate or become day-laborers.

Mr. Soobien.—If the occupier of the land pays rent to the landlord in kind, then the failure of crops implies nonpayment of the rent. If the rent is paid in money it is generally customary with landlords to collect it though there is a failure of crops. In this respect the collection of land-revenue, which in failure of crops is usually remitted, differs from the collection of rent. The argument in favor of granting relief by means of suspension of land-revenue is that it removes one item of expenditure for the ryot at a time when he is hard pressed for money for his ordinary expenditure. The idea that he is still a debtor to Government weighs on his mind however, which is totally removed if the land-revenue is entirely remitted. Owing to the frequent division of lands and other causes the majority of agriculturists are landholders of petty holdings and are men who live from hand to mouth. The postponed demand of bad years would in the majority of cases press hard upon the ryots when it has to be paid in addition to the current demand of the year. In a large majority of cases in which suspension of the collection of revenue is granted suspension does not mean remission, but recourse to coercive measures for its collection becomes necessary in many cases, and this presses very hard upon the ryots. If any relief is therefore proposed to be given in the matter of collection of land-revenue, it would be preferable, I think, to give it in the shape of remission.

MYSORE.

Mysore.

Mr. Ricketts.—It is not a recognised feature of the revenue administration in this district to give relief by the remission of the demand for land revenue, when the crops fail, *i.e., partially.* The land revenue assessment is based on the principle that profits of good years should cover losses in bad years. It is not assumed that a sufficient margin of profit is left to the landholders to admit of the regular payment of the revenue under all vicissitudes of season, but only in the ordinary fluctuations that occur excluding seasons of extreme drought. It has not been found possible to collect the whole land revenue in a year when the crops have totally failed. It is not then merely a case of undue pressure, but it is an impossibility to answer fully the question as to what amount of failure of crops is held to justify what amount of leniency in collection. Other collateral questions have to be gone into, such as, (1) whether the crops of a few preceding years were good or otherwise; (2) whether the landholders are well off as a rule or the reverse. There was a very general failure of crops in 1876-77, and the authorized remissions amounted from 11 per cent. in the best taluk to 34 per cent. in the worst affected taluk, or an average for the whole district of 23 per cent.; yet there was an unusually heavy balance remaining at the end of the year, viz., rupees 3,45,003, out of a total land revenue demand of rupees 7,11,714. With such known results for 1876-77, the policy of no remissions, but merely postponement, in 1877-78 appears of very doubtful advisability.

Where the occupier of land pays rent to a landlord he would expect similar remission or suspension as granted by Government to its ryots.

The arguments in favour of giving relief in form of suspensions I presume are that Government cannot afford to forego the suspended amount altogether, and knowing that there will only be suspension and not remission, it will teach the ryots to be more straightforward and provident. In favour of remissions it is to be said that ryotwari accounts are annual, and that it is highly advisable to settle and close them annually; and when a ryot is remitted a part, he makes endeavours to pay off the balance, whereas, if only suspended, he gets discouraged, makes no attempt to pay off, and lives in a hand-to-mouth sort of way, which not only prevents Government recovering the sus-

III. Qn. 37. **MYSORE.**

pended amount, but interferes with the well-being of the ryot, drags him down, and with him the Government revenue. It is highly inadvisable to encourage anything like domiciliary visits from petty revenue officials to villages and ryots' houses. With "suspended" amounts hanging over their heads, the ryots will never be free from such annoyance and oppression. A ceremony may be taking place in their house, and down will come the tax collector to ask how the ways and means were forthcoming when there was still a balance due to Government, and he would probably remain importunate and obdurate till bought off by a fee or bribe. In fact in this new system of suspensions I see a fine field for petty frauds on the ryots, but the harvest will be reaped by taluk officials and even village servants, and very little of the suspended amount will go to Government. Far better is it to decide carefully and once for all what is to be remitted and then absolutely remit that amount. The ryot will strive to pay the balance and then he starts free and exerts himself again to his own benefit and that of the land revenue. I have conducted jamabandi on the ryotwari system from 1856 or so up to the present time, and never before knew or heard of such a thing as suspension. There were remissions where necessary, and the balance had to be and was paid up somehow or other.

I believe that "suspension" practically means "remission" (with an intervening incubus of oppression and extortion on the ryots) in all but a few cases.

In former years when the ryots were not so prosperous as they are now, the conduct of jamabandi required great care and inquiry. The necessary remissions were made, and it was expected that the balance should be collected within the year. The balance uncollected was pretty easily divisible into (1) recoverable, (2) doubtful, and (3) irrecoverable.

Pressure was brought to play to recover No. 1 in full. No. 3 was sent up for remissions, and very soon No. 2 resolved itself into either No. 1 or No. 3, and with like action. And all the above had to be done so rapidly, so as not to interfere with the fast approaching season of a fresh year's collections. Now we have the outstanding balances of 1876–77; similar outstanding balances, as well as suspension amounts of 1877–78, and shortly collections will commence for 1878–79. In fact the accounts and everything threaten ere long to be involved in inextricable confusion. That hitherto the collections have been so moderately fair is, I think, in some measure owing to Mansion House money.

III. Qn. 38.

QUESTION 38.—VILLAGE INSPECTION, AND DISINCLINATION TO SEEK RELIEF.

Is the duty of searching out distress in time of famine in the villages and the people's homes one that properly belongs to Government, or is it sufficient for Government to offer means of obtaining relief, and to expect that the famine-stricken will come of themselves and make use of those means? If it is proper to depute special officers to inspect villages and urge the people to accept the relief offered, what steps do you consider necessary for strengthening the ordinary district staff and enabling them to carry out this duty? What class of officers should be selected for such duties, and what areas assigned to them? May these officers best be servants of Government, or should they be taken from the non-official class? What should be their precise duties, and what supervision should be provided to see that they carry out those duties? At what period may it become expedient to organise such an extra famine establishment? To what extent, and under what general circumstances, has there been any tendency on the part of the people in distress to reject measures of relief offered to them? Where determined disinclination has been shown by any portion of the population to leave their villages and go to relief works or poor-houses, what has been the probable cause of such a state of things? Can it be traced to improper arrangements for the reception of applicants for relief or for admitting them to employment on works, to an insufficient allowance of food or wages, or to any such causes? Can any other causes be named which may have conduced to the disinclination to seek relief, such as physical prostration or habitual want of confidence in officials, &c.

Punjab and North-Western Provinces.—Opinions not expressed strongly in favour of village inspection and relief. Some expressed against it. The people are stated to have been deterred from seeking relief by the Public Works management, by the conducting contractors, by the cold of 1877–8, by dislike of cooked food, by reports that they were to be sent to the Colonies.

Bengal.—Opinions not unanimous, but the majority hold that it is the duty of Government to take early measures to seek out distress in the villages. It should be done by the village circle system used in Behar in 1873–4. Government officials are most efficient for this work.

Bombay.—Village inspection is the most important feature of famine management. There should be at least a deputy collector to each taluka, and also an extra mamlutdar for famine work. Under them, inspectors, one for each five villages. Villages should be inspected weekly.

Madras.—Twenty-four European and two Native gentlemen have replied.

There is a general consensus of opinion that distress must be sought out if mortality is to be averted, and that at an early period of the famine an inspecting staff should be organised for the purpose. So far as possible this body should be composed of public officials, and their operations conducted under constant and efficient supervision.

NORTH-WESTERN ROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—If the means of obtaining relief are offered in good time, and before the people who are first affected by the high prices which foreshadow a scarcity are too much reduced in strength to perform a task to which they have not heretofore been accustomed, and a light task only is in the first instance exacted, then I do not think that at the commencement of a famine it is the duty of Government to search out distress in the villages and people's homes until good reasons can be assigned why the means of obtaining relief are not sought out by the people themselves. If the distress is real and the relief is suitable, the people will seek it of themselves without being forced to accept it.

When a demand for employment first showed itself in this district at the end of August last year I made arrangements with Captain Western, Executive Engineer at Narora, for the employment of all able-bodied labourers on the Lower Ganges Canal excavation works, and sent 1,443 men there. They all returned immediately in consequence of the labour done there being paid for by couries, although coolies could earn six to nine couries per basket according to lead, or three to four annas per diem according to their exertions. In September, special relief works, *i.e.*, improving district roads (earth-works only) were started, and, with the view of enabling the zemindars and headmen of villages to provide employment for their tenants, they were given contracts on these roads at favourable rates.

The task-work system was adopted and weekly payments made to the contractors, while daily payment from them to the labourers was enforced. The contractors found it difficult to get even a moderate task from their men, and did not employ the weaker ones, and doubtless often found it inconvenient to make daily payments for a mere nominal return of labour. Thus this system did not afford the relief it was hoped it would do either to the zemindars or their tenants.

In the middle of December, when the days were very short and cold, daily-labour gangs were started, on which only such men, women, and children were employed as were unable to perform the task exacted by the contractor. The attempt to enforce even the very lightest task-work from these gangs made the works unpopular. During former famines the people had been fed for doing next to nothing, and could not during the winter months understand why they should not then be treated with the same leniency.

The mortuary returns for December, January, February, and March, given in reply to question 25, Chapter I., show clearly that the system adopted with the very best intention of giving the largest amount of relief at the least cost to the State failed to attain that end. Since the re-opening of the relief works in June only the daily-labour gang system has been worked, and it has answered very well indeed. It is true the people were in a very much better condition when first coming on to the works in June than they were when they did so in December, but they have gained wisdom with the experience of hard times, and, although a large proportion now on the works are women and children, the cost of the earthwork executed by the inefficient gangs ranges now two to three per thousand cubic feet against Rs. 3-8 to 9 per thousand cubic feet during the cold weather. The scale of wages, too, is now so liberal that the labourers can be fined if they will not work, and yet have sufficient left to subsist on. The former subsistence rate would not admit of this.

When in camp, the greater portion of the cold weather, the tahsíldars in all parts of the district told me of the unwillingness of the people in real distress to leave their homes. I rode into the villages myself, and told them if they would come to my camp I would send them into the poor-house on carts. They did not openly refuse my offer, but came not to my camp. I then sent a trustworthy official to bring to me such of them as really appeared to be dying of starvation, and many of these had gone only a short distance from my camp when they left the cart and returned to their villages. The confinement at the poor-house and distrust by those who knew not what arrangements had been made for cooking the food, and fear entertained of being turned out of caste if they accepted such food, and the rumour current that those who came were to be sent across the seas, which rumour had arisen in consequence of some recruiters having enlisted some emigrants for Demerara about the time the distress first appeared, all operated to restrain the people of this district from seeking relief at the poor-house.

Mr. Tracy.—The main cause of the disinclination of the people of these provinces to go to distant poor-houses and relief works I believe to have been the intensely cold winter of 1877-78. I have no reason to think that they were kept away by improper arrangements, or by insufficiency of food or wages. Physical prostration may have had something to do with their unwillingness to leave their homes, but I do not think that they were deterred from applying for relief by want of confidence in officials. When the mild weather returned they came to the works in large numbers.

Mr. Kennedy.—If it is the duty of Government to preserve not only the flower of the population, but the destitute and needy hangers-on of society, then of course it becomes the duty of Government to search out distress at the people's homes. This appears to me a very difficult task. Even the zemindars themselves frequently know very little of the poorest classes in their villages. Last year I frequently failed to learn from them what families had lost members by death from starvation. The class which suffers chiefly is not the agricultural, with which the zemindars are acquainted, but the still poorer classes dependent upon agriculturists. If, therefore, there is to be home relief, the work of inquiry will chiefly fall upon Government officials. The lowest class of Government officials have not sufficient humanity as a body to be trusted with this work, and I consider the supervising staff would require to be unusually strong. These remarks apply chiefly to villages. In towns it would be easy to organize a staff of non-official workers from the numerous middle and upper classes who would know their own neighbourhood well, and would have sufficient humanity to carry out the Government measures.

The parda-nashin relief given last year in towns was worked almost entirely through non-official persons; they were not necessarily of the upper class, many of them being respectable tradesmen or master workmen. House relief would undoubtedly be popular, but it would be liable to great abuse. It was the only mode of relief which was largely sought for last year. I have already stated in para. 25 the grounds of the popular prejudice against poor-houses; part of this prejudice is undoubtedly well founded, part is based upon absurd suspicion of the designs of Government. At first, last year, no paupers would come to the poor-house in the Jalálabad tahsíl; afterwards by unfortunate arrangements for relief works the poor-house became overcrowded, having over 5,500 persons in it at one time. The arrangements in the Public Works Department last year were improper, since they demanded an impossible task, and gave wages barely sufficient for subsistence. Part of the general disinclination shown last year was undoubtedly due to mental prostration, relief works not being commenced until the famine-stricken labourers had become exhausted, but quite as much was due to the faulty arrangement of the conditions for relief.

As a proof of this I shall mention two facts. First, the municipal works undertaken in August and September 1877 were much more largely attended than subsequent relief works, although the ordinary rate of wages had not been increased. At this time the people had not become exhausted by mental and physical prostration. As, however, these municipal works were attended by a better class than the subsequent relief works, since the one was opened before and the other after the rains of October, this example is not decisive. Second, the Department Public Works relief works undertaken this year demand a smaller task and give better wages than those fixed last year. They have been attended by much larger numbers, although the distress is much less.

Mr. Blennerhassett.—During famine times, I think, the people should be visited in their homes; it is only in this way that the Government can learn the actual state of the people.

Officers of as high grade as possible should inspect the villages; one or two parganas might be inspected

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by each officer; they might be civil officials, borrowed from neighbouring districts; they should keep the people informed of the means for saving them, and if any valid objections are made to accepting relief the objections should be clearly brought to notice and disposed of; if no valid objections can be made, I think nothing further need be done, and it may be left for the people to accept or refuse assistance as they please.

It frequently happens that persons in distress cannot go to relief works, because they will not leave some aged relative or helpless children, or they fancy they will be sent to some distant district; hearing that works are on the Cawnpore road, for instance, they conclude they will have to go to Cawnpore; or if weak persons have been turned off by gangsmen and sent home, others would be disinclined to go. This is a charge that has very frequently been brought against gangsmen, apparently with truth. Physical prostration is probably a common cause, but this could be overcome by any officer known to and respected by the people.

Bengal.

BENGAL.

Mr. Barlow.—I think that village visitation in time of famine is a duty that properly belongs to Government, (1) because it is one of the most effective of all relief measures, and therefore should not be omitted when Government is straining every effort for the public good; (2) by habit, and not of malice, the people generally are so slow and dull that the country must be searched and all must be guided and helped toward relief before it can be assumed that a fair opportunity of saving their lives has been afforded to every one. I cannot suggest a better organisation for relief work than the circle system we had here in 1873–74. Officers who have worked in this capacity will be the best judges of the area or number of villages that one man can efficiently supervise, and these also will give the best account of the precise duties of the appointment, supervision, &c. But to one thing I can bear testimony, viz., that, whether selected from the official or non-official class, you require in every one of the posts a picked man of high merit, and, failing this, everything is a failure. Supervision is useful to regulate and examine results, but it has no motive power necessary for famine work. A circle officer, to be efficient, must go on discharging, at a high pitch of energy, duty the most unpalatable and overwhelming. High qualities are wanted for this. The right kind of man would probably be most easily found in the official ranks, and it may be added that, where the standard is not reached, an additional security is found in the fact that a man is an official, but for a good man it matters little where he comes from. The organisation of a complete famine establishment would appear to become expedient as soon as it is discovered that distress is of a very severe character, general, and otherwise than temporary. The cases alluded to in the latter portion of this question have not occurred in my experience.

Mr. Worsley.—I do not consider that it is the duty of Government to search out distress in time of famine in the villages and people's homes. If relief works are opened at a sufficiently early period, the people have only themselves to blame if they stay at home and starve. It is in my opinion no more the duty of the Government to search villages in time of famine for persons in want of food than it is its duty in ordinary times to search for persons in want of justice. The people should not be treated as children, but they should be made to understand that they must use their hands and feet, and not show themselves inferior to mere animals. If we once admit that we are bound to search for distress, we must be prepared to carry food to distressed persons if they decline to come to us for it. No difficulties under this head occurred in 1874.

Mr. Toynbee.—In my opinion it is simply sufficient for Government to offer definite means of obtaining relief, and to expect that the famine-stricken will come of themselves and make use of those means. Where the famine is severe and confined to a small local area it might be possible to adopt the course suggested in the first part of the question; but it would be financially ruinous to do so, even if it were possible to find sufficient agency. Where famine is not severe and widespread such a course would tend to the utter moral ruin, helplessness, and degradation of the people. It would be fatal to the continuance of that large-hearted and far-reaching system of private charity which forms a part of the daily life and religion of the people, and which in times of scarcity and distress should be tenderly nursed and encouraged rather than supplanted by the State and left to die a natural death. I should earnestly deprecate any resort to the procedure indicated in question 38, except under the special circumstances under which it was undertaken in Orissa in 1867. Such a measure would paralyse the executive power of a Government, to say nothing of its finances.

Mr. Finucane.—In the early stages of the Bengal famine of 1874 many persons would, I think, have starved if Government had contented itself with offering the means of relief and had not sought out distress. I consider it was then the duty of Government to search out distress in the villages and in the people's houses. I do not, however, consider that it will be necessary to search out distress in any future famine occurring in the same parts of Behar or Bengal. The people are sure to come forward and seek State aid of their own accord. The only difficulty will probably consist in excluding unworthy applicants. The class of officers who answered best for village-to-village inspection as relief superintendents were sub-deputy collectors of the subordinate executive service and native military officers, such as duffadars, subadars, &c. Their duties should be to visit every village in their jurisdictions, say, once a month or oftener, to inspect the recipients of gratuitous relief, and to see that nobody was in receipt of such relief who could get on without it; while, on the other hand, they should take care that all persons who really were in need of gratuitous State relief were in receipt of it.

Mr. Marindin.—It is the duty of Government to place relief within the power of the weakest and most ignorant to obtain it. The obligation to save life in a famine extends just as much to saving the life of very young children and persons confined to their homes by sickness or old age as of the rest of the community. Such persons in many instances cannot come themselves in search of relief, and unless they are sought out by Government must die of starvation. Besides seeking out such persons, it is the duty of Government to place the means of relief within their reach, which must be done either by conveying food to them in their homes or transporting such persons to the nearest poor-house; but I do not consider it part of the duty of Government to urge people to accept the relief offered.

While it is obligatory on Government to search out and bring relief to persons of the above description, it can hardly be said that this duty extends to conveying relief to the doors of those who are able to come to the central spots where relief is obtainable: it then becomes a question which is the best way of operating—administering relief in village or at central depôts.

I have had no experience of general relief by the poor-house system, and am not prepared to discuss

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its comparative advantages over the village-relief system. In my answer to qustion 40 I have drawn attention to some of the advantages as well as evils attending village relief, and have also given an outline of the organisation required for carrying it out.

Mr. Metcalfe.—It is, in my opinion, undoubtedly the duty of Government in times of distress to search out and relieve starving families, otherwise whole families will miserably perish. There is a vast number of persons who are too proud to beg, who are unaccustomed to leave their villages and homes, and who will simply pine away and die in their houses unless they are rescued and relieved. I would attribute the disinclination evinced by the better classes to ask for relief rather to the secluded lives they lead than to habitual want of confidence in officials. The great mass of the people have but little means of knowing the actual intentions of officials : the information they gather is from gossip or from reports circulated, many of which are totally false.

To the question as to what class of officers should be selected for the duties of relief, I should say, after my experience of the Behar famine, that military officers of Government of all grades and ranks, both European and native, are from their habits of discipline and order best suited to assist the civil officers of Government in carrying out a proper system of famine relief. Whether as village-group officers or in charge of transport, the native commissioned or non-commissioned officers of Government were most valuable coadjutors, while the commissioned military officers, whether in charge of transport trains, or in opening out communications, or in charge of relief circles, did most admirable work.

Mr. Kirkwood.—To search out distress in time of famine in the villages and the people's homes is, owing to the social system existing in India, emphatically the duty of Government. It is not enough to offer means of obtaining relief; those means have to be such as are acceptable to the deep-seated prejudices of the people.

The staff of officers necessary for this village inspection has been set forth in answering question 31, where I have referred to what was done in Bhagalpore district in 1874 in regard to this duty, and have pointed out how it should be performed on any future occasion. Good Government officials are generally more adapted to the task than persons of the non-official class. They have generally more experience in method, more knowledge of returns, more power of discrimination. But the lowest grade of the inspecting staff, namely, those whom I have elsewhere styled group superintendents, should ordinarily be non-officials of some small local consideration.

But, beyond this, the point on which I have most dwelt is that we must not stop short with the group superintendents, paid or unpaid. We must have a proper organisation in each village. The moment we go beyond the stage of great public works it is totally impossible to deal with the people in detail unless we have them localised and individualised, village by village, and name by name. We cannot send them away from the roads till the village machinery is ready to receive them; we cannot distinguish people receiving relief by labour, charitable relief, and relief by advances, or prevent the same persons from receiving relief in different shapes, till we have all those receiving relief registered, name by name, according to their villages by some person who knows them, and who can be made responsible for their coming and going. Above all, it will be totally impossible to deal with the people on our hands, and wean them eventually from dependence on Government, unless we have an individual knowledge of them in their villages. I have occupied myself, then, in impressing on the local officers the necessity of carrying out a village organisation. This should be done as much as possible through the zemindars. No man in the position of a landholder should be absolved from his duties and responsibilities if it be possible to obtain assistance from him. Finally, the headman and putwari must be utilised in each village. They will keep a nominal roll of all persons in the village receiving relief, either on works or gratuitously. Through them the village management may be conducted, and they will be responsible to check abuses. Small rewards according to work done may be promised and given to such headmen and putwaries. I authorise the Commissioner to arrange details of their remuneration.

Physical prostration, sickness, infirmity, old age, and infancy, home ties, an inability to summon up courage to face the unknown evils of a work or poorhouse situated a long distance from home, a timidity or reluctance to alter their habits, a strong caste prejudice against accepting relief offered in public in the poor-houses in the shape of cooked food, or in return for hard and unaccustomed manual labour, such as earthwork, have been the chief causes, so far as I know, which have made people disinclined to leave their homes. I have no experience of cases in which improper arrangements for reception or admission, or an insufficiency of food or wages, or habitual want of confidence in officials have operated in this direction. But I can easily conceive their doing so. The "distance test" would probably be a most potent agent in inducing the people to stay at home and starve. This, coupled with a task test of some sort, appears to have suddenly reduced the relief labourers in the Bombay Presidency, in February 1877, by 102,000, an operation which the Viceroy has referred to as causing "friction, distress, and loss." Of the persons who thus struck work Sir Richard Temple, in March 1877, wrote that, though some of those who in this passive way had resisted the application of those tests had returned to work, there were many still in their villages, and these were apparently commencing to suffer considerably. In Kaladgi district officials were at this time expressing an opinion "that the results of shifting "people to roads away from their homes must be "carefully watched, as their reluctance to go far "from home sometimes makes the people drift into "danger." Writing of the Salem district in the middle of April 1877, Sir Richard Temple stated: "The system of village relief and visitation is being "carried out all over the district, and nowhere is it "more needed than here. In some of the worst "tracts it was probably not commenced soon enough "in full force." Of other districts in Madras, at the end of April he telegraphed, "Village inspection and "relief being better developed, but still not complete "everywhere. I have again urged its full develop- "ment." The inspections and registers should have been completed in January, and relief under this system should have been given in February, as I have advocated in my answer to question 31.

BOMBAY.

BOMBAY.

Mr. Hewlett.—The whole success of famine management depends, in my opinion, on a rigid village inspection. As stated in a former part of this report, in my opinion it would be better not to take up the time of the civil officers in looking after civil agency works. I think a much more effective plan would be to have large relief camps under Public Works Department officers in central places, where all could be sent. At them there should be camps for the labourers, a general hospital, and a relief kitchen and a poor-house. Everything there is under one management, and the medical arrangements are simplified and concentrated. The poor-houses at the zillah station, at the taluka station, and at the branches would be supplementary, and in addition to them at each large relief work there could be weakly gangs, or what we call civil agency gangs, who could be gradually drafted to the Public Works Department gangs.

The civil officers, then, with their inspectors, would be engaged in inspecting villages, sending the infirm, reduced, &c., under care of the police, to the nearest poor-house in the first instance, and then those who were in a fit state should be drafted to the central relief work. No inspector should have more than five villages to inspect. When I inspected a village I sent word to the patel overnight to have all the villagers drawn up in one line,—men, suckling mothers, mothers with children, other women, boys, girls—outside the village by a certain hour, when I was careful to be present. Before inspecting them I proceeded into the village accompanied by the patel, and we made a regular house-to-house visitation.

Having learnt the number inside the village and their condition, I proceeded to those outside, and I picked out those who required special treatment, and then gave orders regarding their disposal, some to be sent to a relief work, others to the relief house, &c.; some required to be carried in carts, others could walk. All were sent under the charge of the police, food being provided for them, and batta given according to the orders of Government. So many were to be fed in the village by the patel. These were generally children of robust parents or of parents who would not feed them. I then called for the village registers and inspected them, and compared the mortality of this year with that of the last, inquired the census number of village, and compared the number present, inquired how the deficiency was accounted for, how many had gone to relief work, how many had emigrated, how many had died, how many houses were deserted, what was the price of grain, the condition of the water supply, &c., rainfall, prospects of cultivation, &c. &c.

The Mhars and Mangs were the most difficult people to deal with. At the commencement of the famine they were well off, as they eat the carcases of the dead cattle; but as the cattle disappeared they suffered extreme distress, and would not go to relief work even when close by. Inherent laziness and blind fatalism can be ascribed as the only cause of their disinclination to go to relief works.

This disinclination to move on the part of these people seriously complicated our relief measures, and I hope that the legislature will provide power in any future famine to compel them to go to relief works. Doubtless, as the famine became protracted, physical prostration was a factor in producing this disinclination to move out of their villages, but in my opinion it was principally due to their inherent laziness and disinclination to work.

Mr. Norman.—I think it very doubtful whether Government should undertake the duty of searching out distress, and at any rate this system should not be introduced in the early part of a famine. The village officers are acquainted with every one in their village, and to them in the first instance should be entrusted the duty of taking care that no one dies of starvation. This was done during the last famine. When the distress becomes very severe, it may be necessary to appoint village inspectors in sufficient numbers to ensure that each village shall be visited at least once a week. These men should all be Government servants of the ordinary karkun class. It would be their duty to supervise the village officers, not to search for distress, but to investigate all cases brought before them. My experience does not lead me to suppose that people will die sooner than go to the relief works or to a poor-house. Many causes lead to a disinclination to go to the works, such as hard work, poor fare, and much exposure, but this disinclination cannot, in my opinion, be traced to any cause capable of remedy. Relief works cannot be made too inviting, the object being only to support those who have no other means of subsisting. If they desert or prefer to remain in their homes, it may be assumed that they have some other means of subsistence.

Mr. Spry.—If Government undertakes famine relief, I think the duty of searching out distress in villages and people's homes is a concurrent obligation without which the relief would be both inadequate and incomplete, because, in thousands of cases, unless the people are literally forced to go to relief they will not go.

Under ordinary circumstances an assistant or deputy collector has three, and often more, talukas under his charge. When a special famine establishment is entertained, there should be an assistant or deputy collector to each taluka; then there should be a relief mamlatdar in each taluka, and if the taluka should be a very large one, or having many outlying villages, there might be appointed some one or two divisional inspectors, having each 30 or 40 of the most distant villages under them. Lastly, there would be the circle inspectors, who would each have in their circles a certain number of villages, varying according to propinquity to each other and the intensity of the distress. From 12 to six villages in each circle are what I have found necessary. For efficient supervision it is a mistake to have the circles too large.

The higher classes of relief officers, such as relief mamlatdars, should certainly be Government officers. I have found selected *chief constables to be by far the* most efficient for this purpose. For the lower grades, if they can be procurable from other departments, such as the medical, educational, or police, it is much better to select qualified men than to have outsiders. The duties required, and a certain command over money, make it essential that circle inspectors, &c. should have some stake in Government employ which outsiders, temporarily appointed, have not. During famine it is necessary to entrust all patels of villages with small sums of money to relieve casual and unexpected cases of distress. Accounts of this expenditure and a register of cases relieved have to be kept. It is the duty of the circle inspector to visit each village say twice weekly, to inspect these accounts and registers, and also to make house-to-house visitations to see that people are properly relieved and that none are starving. The divisional inspectors and relief mamlatdars will then come and see that not only the circle inspectors do their work, but also the village officers. The latter also will scrutinise the accounts of all the subordinates, and keep them supplied with money when their balances are expended. They will, further, look after all the relief houses and civil agency works in their charges. The assistant or deputy collectors will exercise general control over the whole.

I think it would be as well to begin village inspection as soon as people begin in any numbers to wander about listlessly without object. I think it would tend to inspire confidence in them and keep them at their homesteads.

Caste prejudices and disinclination to leave their houses often induced people to reject relief. Fatalism had also much to do with it. Many lingered on in hopes of a favourable turn, till they got so reduced that relief became almost useless. There have always been a certain number of such in each town and village. I have not found any reason for believing that any determined disinclination arose from want of management. The disinclination was more that of individuals than of bodies of people. If it had been the latter there might be cause for believing that matters were not as they should be. As regards want of confidence in officials, I think that in this district at least the masses of the people appeared to place the greatest confidence in the European officials, and also in some of the native ones. If an official did his work he soon gained confidence, and *vice versâ.*

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Bombay.

Mr. Moore.—It should be sufficient for Government to offer relief and the people ought to come, but unfortunately they do not come, and they require to be sought out. I think that the machinery we used was effective, viz., schoolmasters and sub-registrars for the towns in which they reside, police and general duty karkuns, a few special inspectors and bailiffs of the civil courts. The class mentioned above. Better be Government servants. They should do house-to-house inspection every day, and general inspection of the villages night and morning, to see that every one who is in need of relief gets it; if he is close to work, that he is sent to a work; if he is sick, but fit to be moved, that he is sent to a relief kitchen; if they are sick and unfit to be moved, that they are relieved at home.

When it is clear that lengthened scarcity may be expected. To no great extent, only in exceptional cases. Obstinacy. It cannot be traced to improper arrangements. I can name no other cause than that given in answer to question 8.

Mr. Ramsay.—I reply to this question only in so far as I have any personal knowledge. There is undoubtedly a very great disinclination on the part of the people to avail themselves of Government means of relief. In the first place the tests imposed are distasteful, natives preferring to work their own way, at their own hours, under little, if any, supervision. The maxim of a fair day's wage for a fair day's work is not understood or appreciated. Thus during the past seasons numbers temporarily emigrated in search of a precarious livelihood rather than work under the Public Works Department system. I can only attribute this to peculiarity in the temper of the people, and not to any special want of confidence in officials and official arrangements. Natural indolence too has much to do with it. What the people want is work near home, no tests, and little supervision. They hate all rules, methods, systems, and punctuality especially. Bhils and other hill tribes, as is well known, earn a living by really very hard work, such as wood-cutting, for instance. But they prefer starvation to going to more regular though really lighter work on roads or tanks at fixed hours.

Col. Anderson.—The searching out of cases of distress theoretically can hardly be viewed as the duty of Government. But practically, if no measures in this direction were taken by Government, much life would be lost.

As regards the area assigned as the circle of each inspector, that must entirely depend on the density of the population and the distances of villages apart.

The duties of these circle inspectors should be to inspect with the village officers the entire population of each village in their circle every week or every other week, according to the circumstances of the time, and to require the village officers to send off starving people to the relief houses or works. He must particularly search out starving children, as the people of the lower castes will often see their children starving sooner than be at the trouble of sending them for relief. A difficulty is often alleged as to the means by which infirm people are to be sent to relief camps. This duty should be imposed upon the village by law, and be recovered rateably on each house if necessary, should the village officers not privately arrange to get it done, as they always can if they choose. In rare cases the circle inspector should be allowed to give temporary relief on the spot, with the concurrence of the village officers; all such cases should be registered and signed by both. On such cases the strictest check must be kept, and, except in extreme and exceptional cases, the recipient be soon removed to a relief house.

This extra establishment will not be required until famine is decidedly declared, and it is no longer mere scarcity.

Have never heard or seen any objection on the part of the people to accept relief. The nearest approach to it which I have seen has been the lower castes not sending their children to a relief house when evidently in a starving condition, and when they admitted inability to feed them themselves; simply too much trouble to send the children to a relief house.

MADRAS.

Madras.

Sir W. R. Robinson.—Whatever it may be possible or expedient to *do* in future in relief of famine where it first and most prevails—viz., in the villages and homes of the drought-stricken tracts and in outlying parts of the country—from whence experience shows that the starving only partially seek our works and closed camps, and often too late for any practical purpose;—it is clearly the pressing duty of Government to search out this want and its victims from the very first, and to know what is going on in famine times in such homes in every village and town in the country. It will not do simply to await the monthly mortuary village register. If I were asked to indicate the most serious shortcoming in the administration of the Madras famine throughout, the most fertile cause of confusion, inadequate appreciation of the occurrence and probably of unexpected mortality, I would at once point to our inability to grapple with thorough village inspection and administration in the first stages of the famine, and to a probably inadequate appreciation—the error has been partially rectified in the later stages of administration—of the vital importance of village administration and village relief throughout the protracted occurrence.

Even as respects famine finance I believe that village relief will prove—man for man—more thrifty and life-saving than any other, so far as gratuitous relief is concerned, while there are obvious social and economical advantages in the system which brings the rich and poor into mutual relations and keeps the people together; a village system of relief should therefore be brought into influential action the moment famine threatens.

I have already indicated the kind of village administration which is needed more especially in famine. I will only add that inspection of village relief and administration by State officials must be provided for from the very first—with a view to adequacy and thrift—and the addition to existing taluk establishment required to make the inspection complete should be the first step on the danger of famine arising. And if the constitution of the village agency be effective and complete, this inspection may be confided to *superior* native agency. I doubt whether low-paid village inspectors are reliable.

Mr. Longley.—It is certainly a duty which belongs to Government to search out the class of persons mentioned in Question 31, Section 2, Chapter III., and should be done by a separate paid establishment proposed for each taluk in the answer to the above Question (31).

The ordinary taluk establishment could not undertake the work, but they would assist the special paid relief establishment of the taluk, at the head of which should be one or more European officers according to the size of the taluk. A relief circle should never exceed one taluk, and each taluk should be sub-divided into two or more sub-circles with a paid inspector in charge of each sub-circle.

The extra relieving establishment may be composed of officials and non-officials (paid), but my experience

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leads me to believe that an European officer should be at the head of any such establishment. *Natives* would have no confidence (whatever the Government might have) in a purely native relief establishment, non-official and unpaid, unsupervised by an European official. Each inspector should visit every village and hamlet in his sub-circle *once a week.*

Committees, however, may be formed associating respectable natives with European officers for supervising gratuitous (dole or out-door) relief. In such cases the former must be paid charges incurred in travelling, &c. If a Government officer of high position and respectability is made president of the committee, I have no doubt the system would work well; we have instances of this in local fund boards, and municipal commissions, and in the late local famine fund committees. If, on the other hand, the committees are to consist of purely native non-official element, they are certain to prove a failure, of which, if a pregnant example were wanting, I would point to the Temple committees.

This extra establishment should be organised when famine has been clearly diagnosed.

There has been a great disinclination on the part of the people to leave their houses and villages to go to relief works or to camps. The following may be assigned as reasons for this disinclination :

(1)—Knowledge that, as soon as they leave, their houses will be rifled, the rafters taken for fire-wood, and the straw for cattle.
(2)—Unwillingness to be away from their village when favorable rain may fall.
(3)—Knowledge that a large number of those who enter a relief-camp die there, and consequent fear that they will also die away from home.
(4)—Fear that on return they will not be admitted to caste privileges.
(5)—In the case of relief-works, uncertainty as to proper payment and fear of disease where large numbers are congregated, the sickness on any work being, as a rule, greatly exaggerated.
(6)—Apathy; a preference for a precarious existence (but free of trammels or tests) on wild fruits, roots, &c.
(7)—Among the hill-people a dread of the plains and large towns.
(8)—Physical prostration.
(9)—Among the following classes :—

Brahmins,
Rajputs,
Banians (Komities),
Chetties (of all description),
Thondamundalam Vellalars,
Sri Karnams,
Sathanies,

very strong caste and social prejudices against going either to a relief-work or camp; and for these the only relief, to be really such, appears to be the money dole in their villages.

Mr. Price.—As regards poor-houses, during the real pressure of the famine the people were exceedingly anxious to get in, but when village relief got into full swing, the poor-houses were at a discount. Stories of the most extraordinary kind were set about, probably by designing village officers who wished to have the handling of as much money as possible and to keep the people on village relief. Amongst these I may cite the following :—

(1) That Government were collecting people in Cuddapah poor-houses and fattening them in order to, when they were in a fit condition, hold a Juggernath festival and crush them to death under the wheels of a train.
(2) That Government were taking the people in, in order to ship them off to "Mourice" (the general term for any country to which emigration takes place), there to keep them for the term of their lives as slaves.
(3) That the object of Government in opening poor-houses was to decoy all that they could into them, destroy their caste, and make Christians of them.
(4) That no one who went into a poor-house ever came out alive. These and similar canards no doubt kept many people away from relief, but I believe that the main cause was the irksome character of the life, the want of liberty, of betel or tobacco, the regular hours, enforced cleanliness, and perhaps, association in the same enclosure with people of all kinds; but the restraint and discipline were what mainly rendered the poor-houses, as the famine diminished, more and more unpopular and this unpopularity was intensified by the freedom enjoyed by those on village relief, and the opportunity which this afforded for wandering about and begging, picking up greens in the fields, and so on. I cannot call to mind any causes other than those mentioned; physical prostration would prevent people going to works or poor-houses, but I do not think that it had anything to do with their inclinations. As for habitual want of confidence in officials, I never heard the reason advanced, though I have heard many of them called rascals, and I think not without some cause.

Mr. Grose.—In my opinion people should not be allowed to die of starvation even if they wish to, and there are many cases in which starving people are unable to move towards relief, so that it is the duty of Government to search out distress in the very houses of the people.

This search must be conducted first by the Revenue inspectors assisted by the village officers, and afterwards by specially appointed officers of the same grade. Their ranges should be of such a size that they can visit each village in it at least once a week. They should be officers in the ordinary employment of Government who look forward to pension.

They should be required to inspect every village once a week, to inspect every house occasionally, to see that the village officers do their work, to examine the registers of village relief, to inspect or secure the *bonâ fide* inspection of all new applicants for relief, such as gosha women, to give food, or pay village munsifs for giving food when starvation cases are found, and to see that such cases are sent to the relief-camps. Tahsildars and deputy tahsildars can supervise to a certain extent, but when the duties of these men are onerous and responsible, the supervision of an European officer is required.

As I have already stated, I think that a special organisation for village inspection should be started when the reports of the village corporations and Revenue inspectors have shown that relief-camps should be opened.

People show a great reluctance to enter relief-camps, chiefly because there are such a large number of deaths in them, as there must be when they contain crowds of emaciated people. The reluctance to enter on particular works and the tendency to leave them I have already spoken of.

I have not noticed habitual want of confidence in officials acting as a cause for the refusal to enter relief-camps, or go to relief-works, but such a want of confidence undoubtedly acts with reference to particular individuals. Any severity or harsh usage of which they may be guilty with regard to paupers is always exaggerated. It is one of the dangers to be kept in view that if relief-works or relief-camps are made *too* disagreeable, paupers will hesitate to go to them till they fall into such a state of physical prostration that they are unable to do so.

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Mr. Lee-Warner.—The work of searching out distress in the village is not a duty that properly belongs to Government. It is sufficient that Government offers the means of obtaining relief at sufficiently numerous selected centres. Inspection of the villages is none the less necessary to procure information showing whether the centres selected are sufficiently numerous to meet the wants of the people or not. For this work every large village ought to be visited at least once a week by a revenue subordinate, who, if he has other duties, cannot well manage more than an area of fifteen square miles; but it is to be borne in mind that in time of real famine other revenue duties are very slight. Villagers will never refuse to accept relief in the villages. They dislike going to relief-works or poor-houses away from their homes, because of their attachment to their own homes, some concealed means of subsistence, or superstitious or other motives. I remember, however, an instance of villagers declining to take money-dole. It was my first visit to the village, and I selected about ten persons for gratuitous relief on the money-dole system after a minute inquiry in the village as to their circumstances. While the copper coins were being fetched, a heavy shower of rain came up, the first shower after months of drought, at the end of which the village headman came forward to beg that relief might not be given. Thinking that the persons selected might have a different opinion, I proceeded to pay them myself, but they were evidently afraid; perhaps the village headman had a superstition that the receipt of any gratuitous relief might ruin the village, or thought that this first shower was the beginning of change, and that people hanging about to get gratuitous relief would not come to his fields.

Mr. Austin.—It is, I consider, undoubtedly the duty of Government to search out distress. It is not so much that the famine stricken will not come forward, but they do *not* know where to go to make their distress known. In many cases, moreover, they are afraid to come forward. They dread being taken from their homes; they dread being sent off to camps. Therefore special officers must be deputed to supervise relief. The ordinary district staff is wholly insufficient for the purpose.

Mr. Martin.—Unless Government search out the people in the villages, there *must* be great mortality.

There are, I think, two different kinds of inspections necessary. One should be made immediately when it appears undoubted that a great scarcity, if not famine, is imminent. This should be made by the deputation of a great number of officers from the nearest districts aided by the superior native officials of the threatened district, and should be with the object of assuring the people that relief will be provided when necessary, and informing them of the places to which emigration will be dangerous and of those to which they may safely go. Officers should be sent at the rate of one to each tract of thirty villages, and each deputed officer should make this preliminary inspection in three days, and be ready to return at once to his own duty if not ordered to remain.

I would make it the duty of the inspecting officers to see their whole charge twice a-week, and to be present at the distribution of the village relief in each village once a-week. They should have control of the birth and death registers of their charges, and certify that they have tested the accuracy of the entries in them. They should attend to the water-supply of the villages, and when it is very impure get leave to improve it by famine labor detailed from a famine work (I regard the frightfully bad water-supply during a famine as largely responsible for the immense mortality from internal diseases), and they should have at their head-quarters a depôt for the reception of applicants for labor, where they should class the applicants into those for professional agency and those for civil agency works, and pass them along to the nearest similar depôt in the line of route to the work, to be thence passed on in a similar manner.

I found at first a disinclination on the part of many people to leave their villages. It was before the village money-dole relief was instituted, and principally was among the old, debilitated people who wished to die at home, and who afterwards were recognised as persons to be relieved at home. After the institution of village money-dole, the objection to leave the villages was almost altogether arising from the hope that the objector would succeed eventually in getting on the money-dole register.

Mr. Oldham.—I have never had experience of any general disinclination shown by the people to go to relief-works, unless these works were at a distance which they considered inaccessible. The exception to this is the systematic vagabondage described in the answer to paragraph 36. The people resorting to it are isolated units or perhaps families.

In Orissa people of the respectable classes—none in fact but low caste-people—would go to the relief-camps. This disinclination had nothing to do with improper arrangements for admitting applicants to relief.

In isolated instances, which have at some periods become pretty numerous, persons have been found disinclined to seek relief, from physical prostration, from habitual want of confidence in officials, and most commonly from arrangements on relief-works which either were not, or which they thought not conducted in a way calculated to give them relief.

Mr. Gillon.—The system at present in force in the Madras Presidency seems to be very well suited to attain the ends in view. One European relief officer is appointed to supervise a limited area which varies in extent according to the severity of the distress. In the height of a famine this should not exceed half a moderate-sized taluk or include more than sixty villages, unless they are very close together. In the early stages of distress, and when it is on the decline, one officer will suffice for one or two taluks. Under each European relief officer are a number of native relief inspectors, who receive from Rupees 25 to 35 a month, and have one or two peons each to carry reports and returns, and assist the inspector in his duties. Each inspector has to inspect a certain number of villages varying from ten to a much larger number, according to the severity of the distress. It is the duty of the relief inspectors to search out all cases of distress, and to deal with them according to the rules that may be prescribed, giving orders of admission to the relief-works or village relief, despatching bad cases to the relief-camp, &c. They have also to see that no one receives relief in any form who is not entitled to it, and to report regarding the state of the country and changes in prospects, &c., in each village. Where there is no village relief, the duties of the relief inspectors are comparatively light and easy; but this is by no means the case under any system of village relief, as will be seen from the remarks in reply to Question 31. This establishment should be organised as soon as it becomes evident that scarcity is deepening into famine. It may not have much employment at first, neither, indeed, should a large establishment be appointed at first; but it is important that relief inspectors, and more especially European relief officers, should as early as possible become acquainted with their respective ranges. It is from these officers only that Government can obtain trustworthy information regarding the state of the people and intensity of distress. The reports of deputy collectors and tahsildars cannot, as a rule, be relied upon, as these officers very rarely have a very intimate knowledge of the existing condition of more than a few villages close to their head-quarters, overburdened with office-work as they must be in a state of famine. As the distress becomes more severe, the special establishments should be increased up to the limit already mentioned.

MYSORE.

Colonel Sankey.—For reply to first portion of this inquiry, please see answer to Query No. 36 (*supra*). As to the causes which have led to the exhibition of a determined disinclination on the part of a portion of the population to leave their villages and go to the relief-works or poor-houses, it must always be difficult for a European to pronounce in any but a hesitating manner as to the precise motives which have actuated the people in this respect. That the motives have been genuine may be inferred from the fact that on the issue depended life or death for themselves and their families. That the roots lie deep down in native society is equally clear, as the same tale of refusal to pollute themselves with camp or poor-houses comes from the North-Western Provinces as from Madras and Mysore.

I confess that to me the thorough investigation of this point is the one of all others which claims the most anxious and humane consideration on the part of the Famine Commission. A woman who has lost both husband and child tells the Relief Officer in Mysore distinctly that she will kill herself and remaining children rather than submit to the degradation of the poor-house. A gaunt ryot tells an officer he casually meets in Bangalore, that he and his belongings have come a hundred miles from home without food, carefully avoiding all inquiry on the road, so as to escape being taken to one of these places. But the tales of this kind are innumerable, and, much as one may desire to do so, it seems difficult satisfactorily to dispose of the charge, practically so frequently preferred in the papers, that the relief-camp and poor-house stank in the nostrils of the respectable classes, who, nevertheless, like others, were perishing from hunger.

Major Moncrieff.—It is the duty of Government to search out distress in villages and homes. Special officers must be deputed for it. Civilians are the best. Officers of experience in the police, in the survey, in the forest department will all be of value. Subalterns from line regiments have proved most admirable relief officers in the last famine, and have shown a readiness of resource, a judgment and an earnestness surprising when one considers their previous training. Above all it is most important that these officers should be what is commonly understood by the name *Gentlemen*, whether servants of Government or not. The best I found to be Government servants. The area to be given to each special relief officer will to some extent depend on the population and on the severity of the famine. Where it is bad, one officer should not have more than 500 square miles or 120,000 people under him. Separate provision must be made for large towns and municipalities. The relief officers should be directly under the orders of the collector or deputy commissioner. Whenever it appears evident that a famine must come on these relief officers should be organized. Government should then start a famine department, and there should be one or more special famine commissioners.

I believe the effect of long under feeding is to produce a great disinclination for any exertion, and a comparative indifference to death. Want of confidence in the officials and the inefficiency or insufficiency of the district officers I have known very much to aggravate these evils.

Mr. Ricketts.—It is the duty of Government to search out distress in time of famine in the villages and the peoples' homes. There should be strict house-to-house and village inspection in order not only to prevent death, but to watch narrowly all growing threatenings or symptoms of distress. The district staff of *village* shambogue, potail, and punchayet, *hobly* shambogue; *taluk* amildar and deputy or assistant commissioner would ordinarily suffice, save that the district officer at such a time should have additional help in extra assistants and European special relief officers, and in very distressed taluks additional ordinary relief officers should likewise be sent out, each to be in charge of two or three hoblies. These ordinary relief officers, either European, Eurasian, or Native, should be selected for their activity, respectability, and humanity. The choice would ordinarily fall upon Government officials, but occasionally equally good men and entertaining a proper sense of responsibility could be selected from the non-official public.

It would be expedient to organize such extra establishment at a very early period of the famine as whole tracts and villages sometimes suddenly and unexpectedly fall into the ranks of the distressed and starving.

There has been no disinclination on the part of the people to go to relief works, except when such works were at a distance. The mortality in a kitchen or poorhouse crowded with human beings in various stages of emaciation was of course great. Then the marshalling in of recipients and the doling out of cooked food was naturally repugnant to the feelings of many natives, and consequently the poorhouses were shunned by the majority of respectable people who preferred to die in their own houses, surrounded by their relatives and friends and to be buried by them, rather than go to a poorhouse and probably die there too, friendless and alone, and then be buried by strangers.

I do not see how habitual want of confidence in officials could have had anything to do with disinclination to seek relief, but physical prostration was undoubtedly a potent cause for such disinclination.

It has been stated that the *back-bone* of famine policy is the employment of all suitable applicants for relief on large works of permanent utility. In readily subscribing to the immense importance of spending money usefully and wisely and on suitable applicants, still I venture to think that the *back-bone* of famine policy should be "village inspection," and systematic village relief. The district officers, his assistants and special relief officers will have enough and more than enough to do in being constantly on the move in villages, watching the condition of the people and carrything out regular measures of relief on a preconcerted system.

After all it cannot be said that a famine is being conquered or even checked by the fact that a certain number of persons are relieved on large works. The hospitals on such works may be good, there may be perfect ganging, and in fact admirable arrangements of all kinds; yet excellent and indispensable as these arrangements may be, can they be said to be anything like sufficient when a short trip into the interior reveals (from whatever cause it may be) villages in all directions where there is much suffering, emaciation, and death. If the same attention had been paid to villages as to relief camps and works, the sum total of misery and mortality would have been far less than it is.

QUESTION 39.—EXPEDIENCY OR OTHERWISE OF STORAGE OF GRAIN BY GOVERNMENT.

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Did you in the recent famine lay in any stores of Government grain for the purpose of feeding labourers or inmates of poor-houses? Was anything done to stimulate trade by offering advances of money or any kind of assistance or bonus to merchants? Did the Government purchase grain, import it, and sell it again to the general public with the object of keeping the local markets supplied? If any such measures were taken, state the circumstances under which the transactions occurred, the reasons which led you and your superior officers to think them necessary, the manner in which grain was purchased and imported, the quantity, cost, and price at which it was disposed of, and the monetary gain or loss realised, or the nature of the advance or bonus given to traders; whether it checked private imports; also the general effect of the whole transaction. If you did not take any such step, do you now consider that it would have been better to do so? If you did it, or it was done, do you think any error was committed in so acting? And, generally, what are the conditions under which such measures are proper and necessary?

Punjab and North-Western Provinces.—Generally the import of grain by Government is held objectionable, except in rare cases when trade fails. In Jarahal, Government grain was supplied to a small extent.

Bengal.—Opinion is unanimous that Government is right to import grain under the circumstances believed to exist in Tirhoot in 1873–4, or when trade will not supply the country. But otherwise, interference with trade is not approved, and it is anticipated that since the construction of the railway no such necessity can recur in Tirhoot.

Bombay.—Interference by Government with trade is objected to; but special cases are given when the purchase of a small quantity of grain was useful to put down combination or bring hoarded stocks into the market.

Madras.—Nineteen European and one Native gentlemen have replied.

Rice was imported by the Madras Government and stored in certain districts as a reserve. It was afterwards used on relief works and in poor-houses, and subsequently the remainder was sold. Some officers think a Government reserve was necessary, others that the trade did all that was wanted in their districts. A majority of opinions is that Government should not interfere except where trade is inoperative, and should never sell below the market rate.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—No Government grain was stored, neither was any grain purchased and imported or sold in this district by the Government. It would not have been better to have done so, as the local dealers were able to import all that was actually necessary, and sold at fair rates with regard to the prevailing high prices throughout the province.

If it is clear that in consequence of collusion among the local dealers the prices in any district are unduly enhanced as compared with the prices current in adjoining districts, then it would be desirable that Government should import and sell grain until the prices had reached their proper level.

Mr. Tracy.—The only conditions I can conceive under which such measures would be proper are analogous to those of Orissa, in 1866, or perhaps of Ajmere in 1868–69, that is to say, where the remoteness and inaccessibility of the tract of country, combined with want of capital and enterprise on the part of the trading class, render it improbable that the wants of the community will be supplied in the ordinary course of trade.

Colonel Fisher.—During the recent drought I did lay in stores of Government grain at certain points of the affected area. I stimulated trade by pointing out the localities where demand was brisk and certain, but when private trade began to show signs of exhaustion I opened the Government grain stores. This grain I had imported in the early stage of distress, and I sold it to the general public at cost price, plus carriage, when there was no grain procurable elsewhere. Grain was purchased in the district of Bijnor through local grain merchants. I bought at different times about Rs. 6,000-worth at prices ranging from 11¼ to 12 seers per rupee in the plains, and sold it plus the cost of carriage, which enhanced the prices to 10½ or 10¼ seers per rupee. On the whole, Government gained nothing. Private trade was not affected, because I did not sell as long as private imports went on. Had I not bought the grain the loss of life in February and March would have been very heavy, because in those months trade was exhausted and food in the hills was unprocurable. I don't consider any error was committed in buying the grain. In future, though, I would throw the responsibility of storage until required for use on the grain merchants.

BENGAL.

BENGAL.

Mr. Barlow.—During the operations of 1873–74 in Behar (including this division), Government imported and stored grain for the purpose of feeding labourers and inmates of poor-houses, &c. It was sold to the public at fixed rates, and also disposed of to local traders (buneahs) at a profit upon these rates, with a view of keeping the markets supplied.

The rules prescribed admitted of the advance of money (at 6 per cent. interest) to traders with a view to stimulate trade, but the plan was little resorted to. This circumstance may be attributed to the fact that the tracts concerned were outside the lines of ordinary import trade, and the mahajuns are slow to embark in new and uncertain enterprises. Importation by Government was decided upon because it was judged that the food-supply available would not meet the demands of the population. Bonus to traders was offered in the hope of stimulating trade and increasing the stocks; and sales by Government were finally made when food-supplies were short and bazaar rates nominal. The entire transactions connected with import were in the hands of Government, and local officers have no knowledge of the circumstances or result of the account. Mr. MacDonnell's work shows the total amount imported into this division to be 70,643 tons.* The sales to the public were effected

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	Tons.
* Monghyr - - - - -	8,158
Bhagulpore - - - -	26,318
Sonthal Pergunnahs - -	7,419
Purneah - - - -	24,802
Maldah - - - -	3,946
Total - - -	70,643

H. III. Qn. 39.

BENGAL.

at the rate of 12 seers per rupee, Bengal rice and Burmah rice cheaper.

I do not think the measures checked import by private individuals, because neither at the time nor beforehand were signs of such trade apparent. Apart from the question of whether the whole thing was or was not overdone (a fact which is and must remain uncertain) I think the general effect of the transactions was good.

Replying to the last clause of the question, I say that where the food-supply is short, grain not procurable, and not coming in in sufficient quantities from outside, there all such measures are proper and necessary.

Colonel Burn.—Yes; very large stores of Raj grain bought in Calcutta and the North-Western Provinces. I offered loans to merchants, but all declined. At an interview in Bankipore, when scarcity was only threatening, I obtained Sir George Campbell's sanction to lay in grain, and very soon had to multiply my orders. I bought it from merchants or agents, who shipped some in boats, but sent most by train to Monghyr and Barrh, whence I imported it in carts to Durbhunga, except for my requirements in East Allapore and Nareedigur, for which places my Monghyr agent sent up large quantities up the rivers as far as boats could go, and from thence I carted it to my relief circles.

	Mds.	Srs.	
Quantity - - -	2,76,408	18	
	Rs.	a.	p.
Cost - - -	20,12,794	11	3½
Price disposed of -	9,67,429	9	0
Loss - - -	10,45,365	2	3½

Private imports were nearly nil till towards the end of the famine. Those who had grain in store actually withheld their grain, hoping for higher prices. Export of food-grain was the normal condition of private trade here, and it was because it was so evident that no imports would be made privately that Government and this estate acted as we did. Most assuredly no error was committed in the mere importing grain. I suppose, if this estate had been unable to do so, Government would have had to do it for us; but if we had been left to our own resources, and had not imported grain, no remissions, no money grants, would have staved off frightful mortality by starvation. Adherence to the standard rules of political economy would have proved disastrous here. But hereafter, as I have before stated, if our State railway be extended and if greater facilities for crossing the Ganges are provided, I believe grain merchants, if told Government will not compete, will be able to, and will, import largely; and the very fact that such facilities for transit are available will unearth the hidden stores of grain in the district. I write unearth literally, for all such stores are buried.

Mr. Worsley.—Stores of grain were laid in by Government in 1874; advances of money at 6 per cent. interest were offered to grain traders by way of stimulating trade, but few advances were taken. I believe that the original object of the Government in purchasing and importing grain was to supply it to labourers on relief works, and to sell it at cost price in localities where grain was deficient. Eventually the grain was sold to the general public at comparatively easy rates.

The importation of grain by the Government was considered necessary in consequence of the supposed inability of local grain traders to import grain to the requisite extent, and of their unwillingness to import at all. It was also feared that the grain dealers, if left to themselves, would greatly aggravate the famine by raising prices unnecessarily high. Under the circumstances of Tirhoot in 1874, the general principle of thus importing grain was, I still believe, a proper measure; but with regard to the quantity imported, the rates paid for transport, and the varying price at which the grain was sold from time to time, some errors, I think, were committed. Now that there is a railway from the Ganges to Mozufferpore, and excellent and numerous district roads, and the local traders have got well accustomed to importing grain, I would not consider importations by the Government to be under any circumstances proper or necessary.

Mr. Hodgkinson.—The stores of Government grain laid in by the collector of Sarun in 1874 amounted to 10,98,939 maunds. Besides this, about 1,70,000 maunds were imported for the Hutwah Estate. Advances were given to zemindars and others for the purchase of grain, but not, I believe, to merchants as such. Government imported and stored the grain; sold it at relief works for a price below the market rate; and made large grain advances, of which the estimated value aggregated Rs. 14,26,971-3-11, also at a price below the market rate. The loss to Government cannot be estimated here. I append the figures of the last "famine advance" report to Government.

Total advanced.		Outstanding on 1st January 1878.		Amount since recovered.		Amount since written off.		Amount outstanding on 1st July 1878.	
Cash.	Grain.	In Cash.	In Grain.	In Cash.	In Grain.	In Cash.	In Grain.	In Cash.	In Grain.
Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
6,01,961 10 0	14,28,491 0 11	38,223 13 1	74,357 14 9	1,995 0 3	5,723 8 5	1,890 12 1	—	35,338 0 9	68,634 6 4

I am unable to explain the circumstances which were considered to necessitate the course taken. Importations by Government for relief work expenditure and charity were necessary and wise, I fully believe. But the estimates were excessive in the first instance, and even they were exceeded owing to the means taken to dispose of the grain—means which, in my opinion, were so repugnant to the first principles of political economy and policy that no circumstance could justify them.

Mr. Finucane.—As I have stated in my reply to question 4, chapter II., Government imported grain to Dinagepore in large quantities because the local traders positively refused to import. They alleged that, all their arrangements being made with a view to exportation, they had neither the time nor the inclination to make entirely new arrangements. Moreover, prices were nearly as high in the districts from which supplies could be obtained as they were in Dinagepore. Government advances were offered to mahajuns for the purpose of importation. They scouted the idea of their requiring advances. The reasons, then, which led the superior authorities to think importation on the part of Government necessary were, *first*, that it was known the supply of food in the district would not suffice for local consumption; *second*, that private traders refused to do anything towards supplying the deficit. The importation of Government grain did not interfere with private trade in that part of Dinagepore with which I am acquainted, because there really was no private trade to interfere with. As I have stated in my reply to question No. 4, chapter II., the (mahajuns) local merchants were themselves the first to urge the necessity of opening Government golahs for the sale of grain to the public. I consider the effect of Government importation into Dinagepore was the preservation of the lives of thousands of the population. Had there been no such importations, the supply of food-grain in the local hâts would have failed (as it did fail) by the end of March; panic would have ensued, and the results would have been most disastrous. Private trade would probably have then begun to do something; but meanwhile numbers would have starved. I do not think any error was committed in importing stores of Government grain to Dinagepore. The collector's estimate of the district requirements on 9th February 1874 was eight lakhs of maunds: ten lakhs were imported. I think the eight lakhs would have sufficed; and that the importation of the extra two lakhs was the only mistake connected with the transaction. I would not, however, be prepared to say that Government importation on anything like the same scale would be necessary on the re-occurrence of a similar scarcity. The facilities for importation afforded by the Northern Bengal State Railway would possibly now induce private traders to act. Mr. MacDonnell (whose knowledge of Durbhunga trade is well known) estimates the deficit of the food-supply of Madhubani subdivision for the year 1875–76 at 29,000 tons, or 4,06,000 maunds, and he apprehended that private trade would not be able to supply the deficiency. The import traffic statistics of that year indicated, I believe, that Mr. MacDonnell's estimate of the food deficit was correct; but experience proved that private trade was equal to the task of importing what was required, and this though the tract affected by drought was the most inaccessible in Behar. I consider the importation and sale of grain on part of Government necessary and proper, *first* where it is known that there is a deficit of food-supply, and that private is unable to supply that deficit; *second*, where local traders combine to stop sales and run up prices by fictitious means.

Mr. Kirkwood.—This question seems to have special reference to the recent famine in Southern India. I would, however, here deal with such details concerning the importation of grain as might fall more appropriately into an answer to this question than in reply to question 33.

The circumstances under which such importation by Government took place in Cuttack (1867) and in Behar (1874) are too well known to need recapitulation. The Government then purchased grain, imported it, and sold it again to the general public. Supplies for labourers, inmates of poor-houses, and those relieved gratuitously or by spinning in their villages were also drawn from these Government stores. Large grain advances were likewise made to ryots for their support.

In some few cases in Bhagulpore cash advances were made to local traders for the purpose of inducing them to import grain; but the extent to which this measure operated was very small. The circumstances under which Government importations should generally take place, first of all for the out-of-the-way parts and subsequently perhaps for parts nearer trade centres, are that over a considerable number of adjoining districts there is an assured failure of crops, which, together with exportation or previous depletion of stocks, has left less than half the ordinary available stocks for consumption. If the defect is only one-half, small stores in out-of-the-way parts may suffice; if the defect increases to three-fourths, much more extensive importation operations will be necessary. Strict vigilance is especially desirable in this matter in the case of districts or portions of districts which are purely agricultural and which ordinarily export.

In Bhagalpore the Government sale rate for clean rice was first of all at the end of March 20lb. per rupee, it was then in May (I think) lowered to 24lb., and in July to 26lb. There was much rice mixed with dhan (or unhusked rice), which was sold at 24lb., 30lb., and 32lb., the price of this partly uncleaned rice varying in accordance with the changes in the rate for clean rice. Up to the end of June we allowed selected local traders (who were carefully selected by the circle officer, and were ready to submit to official inspection and regulation) on their purchasing ten maunds or more at a time, a discount of three per cent. on their purchases, they binding themselves to sell their purchasers by retail at no rate dearer than that current at the Government store. This worked well. The traders were quite satisfied, and so were the people. The traders found it very profitable, as they had shops in the bazaars close to the Government store-houses. They each easily sold their ten maunds per diem, which meant a profit of one rupee on this head of their dealings alone. Besides which, purchasers coming for rice bought other articles also. The people found it very convenient, because they could go at any time in the day to purchase, and could purchase in smaller quantities than at the Government store. For at the Government store only whole rupee retail sales were allowed, and by mid-day the store was generally closed for sale to allow of other operations being conducted, such as inspecting the state of the stores, making up the accounts, making issues for poor-houses, labourers, or gratuitous relief, despatching grain to cotton stores or to other sale stores whose stock may be running short, weighing the bags in detail (recording the weight of each bag, and noting that weight on a list as well as on the bag) in readiness for the next morning's sales, which began at daybreak.

But early in July, unnecessarily and undesirably I think, the discount given to these local traders was immensely increased under orders from Government. The Government store retail prices were at the same time lowered from 24 to 26lb. of clean rice, and from 30lb. to 32lb. for half-cleaned rice. The dealers were then allowed to purchase at 32lb. clean rice and 40lb. partially cleaned rice. I think both these measures were very undesirable, and was never able to understand their object. If it was surmised that Government had over-done its importations, and it was considered an object to stimulate sales, that object could not have been thereby secured. There was already a full demand for Government grain. The practical result was that the total sale issues for any month were not increased, less was realised, and another shift in the retail price of grain was shortly made. For the dealers then began to compete for purchasers who might enable them to pocket these heavy profits, and therefore reduced the retail price to 28lb. of clean rice and 34lb. of half-cleaned rice per rupee. This measure naturally, to a great extent, closed retail sales at the Government stores, where the retail price was 26lb. of clean and 32lb. of half-cleaned rice.

I think that all these changes in the selling price of Government grain were a great mistake, seriously blemished the excellent measure of Government importations and sales, and must have been calculated to place a very great check on private importations. My recommendation is, as I have said in answer to question 33, that the Government sales should be at one fixed rate, fixed for each district before the stores are thrown open, publicly notified, and adhered to steadfastly to the end of the famine. That fixed rate should be about treble the ordinary rate; it should rarely, if ever, be dearer than 18lb. per rupee for the grain in common use, or cheaper than 24lb. per rupee. From the Government store no sales more retail than those of a whole rupee-worth should take place. For the more retail sales village dealers (as in Bhagalpore) should be entertained, who should receive a discount of about three per cent. This may either be managed by allowing them to sell at one lb. per rupee dearer than the Government store retail sale price, or (which I prefer) making them retail at the Government store retail price and giving them a discount on their purchases. In order to cover the cost of carriage, moodies whose shops lie at a distance greater than one mile from the Government store on which they draw should receive a discount of five per cent., and those at a greater distance than five miles should receive seven per cent. discount. Some arrangement, much as this, was in force in Bhagalpore.

I must admit that I do not see why well-managed Government importations, upon such a plan and with such objects as I have recommended, should clash with private trade, or why private trade should not be able to exist and flourish at the same time as Government makes the necessary provision for remote tracts, into which it is certain, or at all events the chances are very many, that private trade will never venture on anything like a scale adequate to the support of the people. I think the case of Behar (1874) supports my view. Private trade had there some unnecessary difficulties to contend with. Government importations were, it may safely be said, excessive. Sir George Campbell was in favour of a smaller estimate, and I think he was right. Railway carriage was thus unnecessarily absorbed by Government despatches. The Government rates for land carriage were very generally excessive, and private traders must have felt it hard upon their profits to have to pay similar rates. Prices, too, at which Government sold were changed from time to time in a manner that must have been discouraging to private trade. Nevertheless, early in May 1874, the Government of India reported that private trade was pouring into the distressed districts 50,000 tons of grain per mensem, most of which was drawn from the Punjab and Upper Doab. This was by one line of railway, aided by the river Ganges. Into Madras and Mysore, with four railways at work from other parts of India, and from the seaboard, up to the end of August 1877, the private importations (there being no Government importations) did not exceed an average of 2,200 tons per diem, or 66,000 tons per mensem; this includes all the grain landed on a long stretch of coast and conveyed into the interior by railway, but not that conveyed into the interior by cart or canal. Bombay Presidency was, for the same time, receiving about 1,000 tons daily. Bengal, Burmah, and Scinde were mostly sending their contributions by sea, the North-West Provinces, Punjab, and Central India by land.

It is evident that at the commencement of the Behar famine (1874) there was great reluctance felt by Government to undertaking to sell grain in the distressed tracts. That course was by no means the declared policy of Government at the first start; but, fortunately for the population of Behar, that course was adopted before it was too late.

Mr. Magrath.—All the grain was Government grain in Mudhoobunnee. Advances elsewhere were made to merchants, but we had only Government-purchased grain, and laid it up in depôts at sites fixed by me, to keep the people. I was called on for an estimate. From inquiries and the census tables I estimated the number of people we should have to keep, and for how long, and at the ration above mentioned per head. I estimated at first for 12 lakhs of maunds, which, in the expectation of a prolongation of the famine till the next year, I subsequently increased to 16 lakhs, of which, roughly speaking, taking wastage, damage in transport, &c., 15 lakhs were received. Up to the time I left, in the end of October, something over 12 lakhs had been consumed. The grain was first sold at 10 seers, subsequently lowered to 12 seers, and then, about the time the people went home, to 14 to 15 seers per rupee. Petty traders were always allowed a margin for profit. The purchase of grain was done by the Government of India, and its transport by the Government of Bengal, and thus I have no data for the cost. Some, but not more than 2¼ lakhs, was given out as advances repayable, which in Mudhoobunnee, being carefully given, was almost all subsequently recovered. Mudhoobunnee, having no importers, could have been kept going no other way. The only great loss which Government made was in selling off the surplus grain by auction. Had Government either held the grain till the next hot weather, or exported to Assam or the Mauritius, the loss would have been comparatively small; but the principle adopted was held to be the best, looking at private trade, which rightly or wrongly was supposed to be kept in suspense by the action of Government. If importers can and will do the necessary importations, all that is required is pecuniary advances to them, repayable. But where there are no importers, or where they will not import, Government must step in, or starvation of the masses will ensue.

Mr. Abbott.—Government supplied grain, and also advanced zemindars and planters funds to purchase and retail it at rates somewhat beneath bazaar prices; the throwing of these large supplies into the country prevented the bunneahs hoarding theirs, and acted as a most effectual stopgap to distress, which, but for this action, would most certainly have half depopulated the district.

Mr. Whinfield.—367,399 maunds of grain were imported into the district of Burdwan by Government in 1874. What the exact cost was I cannot say, but I have seen it stated that, with cost of carriage, &c., it was about 9 seers per rupee. This large import by Government led to a still larger amount being exported by private merchants. But as the price ruling in Calcutta was something like 10 seers per rupee, much of this would have been exported in the early part of the year in any case. And I firmly believe that, if Government had not imported grain, prices in Burdwan would have run up to 7 seers per rupee; for it must be remembered there were fears that the crop of 1874 would fail like that of 1873.

Mr. Lowis.—As I have mentioned in an earlier part of this paper, I did urge on Government the necessity of importing grain. From personal inquiry and otherwise, I satisfied myself that there had been gathered only one-eighth of the usual crop. Adding this amount to the stock supposed to be in the district, I compared the result with the total consumption of the population, and found that there would be a deficiency of above 800,000 maunds, which would have to be met by importation. The next thing was to ascertain if timely steps were being taken to import; for, from the want of communication, I heard it would not be an easy matter to bring in as much grain as would be required. Government had offered to help, by advances, any person desirous of importing rice, but no one applied for help for this purpose. I personally inquired from some of the principal zemindars what they intended to do, and learnt that they intended to do nothing. I inquired from the traders' agents at the bunder, but found that, as there was no prospect of there being any rice for purchasers, few were present, and the few there were said their masters were not going to import, as the trouble, risk, and expense was great; and there was also an impression that the ryots had stocks beyond what was supposed. Meanwhile, prices continued to rise, and I at once reported the facts, and began making arrangements to bring in rice; fixed on central positions for golahs; and, in fact, prepared for the emergency that was evidently approaching. Government accepted my statements and figures, and rice began to be imported, though not a day too soon. There was not a great deal of rice in stock, and what there was speedily made its appearance in the market, and was at once bought at high rates. I declined to sell Government rice as long as the market continued to be fairly supplied at 8 or 10 seers per rupee; but when it became dearer and scarcely procurable, except as prohibitory rates, then the golahs were opened, and the dealers supplied with grain, which they were bound to resell within certain limits as to price. Most of the rice supplied to us was Burmah rice, which is very distasteful to a Bengali, and our sales to the paikars or dealers at 12 seers per rupee did not prevent as much country rice as came into the market being sold at 8 seers per rupee. Our

Bengal.

Government sales in no way checked what private trade there was; for, as I have said, our Burmah rice was not in favour, and did not drive any country rice there was out of the market. The circle officers were specially warned to watch the market; and whenever it became easier, and became more abundant and cheap, Government sales were at once stopped, except to our relief labourers. Government rice was never sold to the public unless it was apparent to the circle officer on the spot that there was no other means of supplying the market. When once prices rose above Rs. 4 per maund it was quite clear that there was very little grain in hand with the ryots; but it would have been then impossible to throw large supplies into the districts unless expensive arrangements had been made beforehand, and no such arrangements had been contemplated by any trader. If, therefore, Government had not been prepared to supply the market, there would very soon have been no grain procurable, except at absolutely prohibitive rates, and nothing could have averted a great calamity. The people were dependent on their rice crop alone, there being no cold-weather crop whatever to fall back on; the rice crop had failed, and there was no food in the country, except such as could be imported. The traders allowed time to pass without attempting to supply the deficiency. It was most fortunate, therefore, that the Government supply was on the spot, and it was an unmixed boon to the people that they were allowed to purchase from the Government golahs. It taxed all the resources of Government taking timely precautions to throw sufficient supplies into the district, and but for these precautions there would not have been food enough for the people. I have myself seen the paikars quarrelling who should first secure portion of a newly arrived convoy of rice, which they got at 12 seers per rupee or 3–8 per maund; and yet the very same sort of rice (Burmah), when we came to sell off our remaining stores, the end of 1874, could hardly be got rid of at four annas per maund. A fact like this proves more than any argument could the reality of the scarcity of food: a scarcity which could not have been supplied by the trade, when the traders answered to the necessity of the case by rates running up to Rs. 4 per maund.

BOMBAY.

Bombay.

Mr. Propert.—I have before stated that during the late scarcity, as regards Khandesh, Government did not actually lay in grain under any circumstances, but I obtained a loan from Government to assist municipalities in providing food, not gratuitously, but for sale at cost price. Direct Government interference I object to, unless under very special circumstances, when it may be found that the grain dealers are carrying combination to raise prices too far, but I strongly approve of municipal bodies and charitable committees using every fair means in their power to check the institution of prohibitive prices, before the actual absence of grain in a district warrants the introduction of such prices. Taking the case of my own district, I am convinced and have been repeatedly assured that the establishment of (comparatively speaking) cheap grain shops in the principal towns tended very considerably to keep down the general market rates. The municipalities and charitable committees of Khandesh imported grain from the other side of India during many months, until waggons could not be procured for its conveyance.

Mr. Spry.—Lbs. 246,000 of jowari were imported into the district by Government from Belgaum and Sholapur under the following circumstances. In November 1876, when all hopes of rain had passed and the people began to realise the fact of famine staring them in the face, a combination or panic took place amongst the grain holders in the district. These grain holders are not as a rule merchants in towns, but people living in surrounding villages who on bazaar days bring their stores into the towns for sale. All at once these supplies ceased to come. The bazaar used to be opened with scarcely any grain for sale, and none could at times be got for any money. This was not from any scantiness in the stores, for in fact the stocks in the country were enormous, but simply because their owners would not bring them forward. The district, too, is so isolated that there was no hope of outside speculators being induced to send their grain so far when more accessible markets were at hand. Things at last came to such a pass that at the headquarter station there was the greatest difficulty in getting at any price food for the prisoners in jail, the military, and the police, let alone the general public. The revenue officers had to employ their time going day after day from village to village trying to persuade the grain owners (themselves cultivators) to open up their stores, but with little effect. Some works which were opened for employment of labourers had to be closed because no grain could be got to feed the people. Other works, ready for commencement, could not be opened for fear of attracting large bodies of people for whom no provision could be made. These circumstances were reported to Government, under whose instructions the grain owners were warned that continued combination would only lead to importation of grain. These warnings had not the slighest effect. Grain never had been imported into the district, and the people would not believe it till they saw it. Government then sent the above grain into the district "to "serve as a reserve in the case of failure on the part "of any local dealers or contractors who may have "engaged to supply people employed on relief works."

The effect of the presence of the grain was instantaneous and wonderful; stocks were at once produced and the supplies were sufficient throughout the collectorate, so that there was no necessity for utilising the grain as at first intended. The importation of this grain had another good effect. Before that, such a thing as private importation was unknown; but seeing the facility with which it was brought, local traders commenced importation on their own account to a large extent.

The presence of the Government grain in this district, although not utilised, had a wholesome effect on the prices. A portion of it was stored at Kaladgi, but, getting damaged, was sold by public auction. No sooner did the check of its presence disappear but the bazaar rates mounted up from 18 lbs. to 14 lbs. per rupee, and continued abnormally high. The remainder of the grain was subsequently used up in relief houses.

The above grain, including cost of carriage, &c., cost Rs. 22,898, and in consequence of some of it getting damaged a net loss of about Rs. 2,600 was incurred, but the good it did outweighed all money considerations.

As I have said above, the villagers are the grain holders. They bring their stocks to market and dispose of them through dalals, or commission agents. In order to stimulate competition, Government placed Rs. 20,000 at my disposal to give out as advances for the purchase of grain to such as would undertake to import it and to sell it at a certain rate above cost price, plus cost of carriage. I tried to get these dalals to take these advances, and some few did, but the project was not a success.

I wish it to be distinctly understood that I am an advocate for free trade; but after the personal experience I had, as narrated above, I think that under certain conditions it is obligatory on Government to import grain for the protection of the people against local combinations which competition from outside cannot reach.

Mr. Charles.—No stores of Government grain were laid in for the purpose of feeding labourers or inmates of poor-houses, nor were advances offered to merchants.

I do not think that anything of the kind should have been done, except that it might have caused a saving to Government if jowari for the poor-houses had been bought in the early months of the famine before the price rose very high, instead of buying it as required at the later and dearer rates.

Mr. Moore.—(1.) No. (2.) We gave merchants Treasury orders on Bombay and other large towns at par, thus relieving them from the payment of exchange and the cost of stamps. (3.) At the commencement of the scarcity, when the banias virtually closed their shops, when money could not buy grain in the villages, when no effort at importation by the traders was made, I did buy some grain on the part of Government, but I desisted afterwards because it was against the views which Government wished to carry out. (4.) The total sum advanced for the purchase of grain was Rupees 8,560–3–11. Of this, Rs. 8,216–1–4 were credited to Government by the sale of the unconsumed grain, and the deficit of Rs. 344–2–7 was debited to the relief operations. The arrangement did not check trade, on the contrary it had a most favourable effect. Directly the traders saw that Government were importing and selling grain they were afraid that they would be undersold, so they re-opened their shops and began to import, for they saw that if they did not do so, Government would. (5.) I consider the step I took perfectly justifiable under the circumstances; indeed, I know not what else could have been done. (6.) I think it was not an error. (7.) When private enterprise ceases or is wanting, when grain is not procurable to those who want to buy, then Government should import grain, but not otherwise.

MADRAS.

MADRAS.

Sir W. R. Robinson.—I have no doubt that a very serious mistake was made in respect to the management of the late famine by the reversal of the policy acted on by the Government of India and Her Majesty's Government in respect to the importation of food-grain in 1873–74. The functions of Government in respect to averting starvation cannot be relegated to a local trading community and left to an impossible market—a market which cannot stoop to the platform of life in India with which a famine administration has most to do. The trade which can feed the classes who can pay must of course be briskly and earnestly encouraged—and it will not be discouraged by losing the nominal supply of a class that cannot buy its substitutes for their ordinary sustenance.

Mr. Longley.—No stores of Government grain were ever laid in for any purpose whatever in the Salem district.

No stimulus of any kind was offered to private trade in grain.

No purchases of grain were made by Government with the purpose of keeping the local market supplied. Private trade was *active* throughout.

I do not consider that under the circumstances of the activity in private trade it would have been advisable to do so.

Mr. McC. Webster.—In this district stores of Government grain were not laid in generally. In July 1877, however, owing to the closing of the ports on the west coast by the south-west monsoon, it was anticipated that there would be a difficulty in importing sufficient rail borne grain into the district from the eastward, and arrangements were made to import and store enough grain for one month's consumption of the relief-houses. One hundred and eighty tons of rice were thus stored and were used as occasion required.

No advance of money or other kind of assistance was made to merchants in this distict. I do not consider now that it would have been better if such had been done. The supply of grain, I consider, ought to be left entirely to private enterprise when it is sufficient. In this district I consider it quite sufficient. Government, in my opinion, should interfere only when private enterprise is not sufficient. In any other case they only disturb the ordinary course of trade. By making advances they increase the amount of money to be spent in buying grain, and thus increase the price of the grain when it really does not indicate deficiency of supply.

If private merchants unaided were insufficient to meet the demand then I consider it might be proper and necessary for Government to make advances with the view to encourage imports. It should be done, however, with care. It would generally, I consider, have a tendency to raise prices unnecessarily.

Mr. Price.—There was nothing of the kind in this district; grain was supplied, when required, for poor-houses. In Cuddapah a large quantity of rice was purchased and sent up by Government; I cannot remember the quantity. I believe it was something like 6,000 tons. This was stored as a reserve and was not, for a very considerable period, used either for coolies or poor-house inmates. The object of Government was, I believe, to have in hand in the most inaccessible and distressed portions of the district a stock of rice which would meet any sudden emergency, and it was accordingly not used, excepting once, I believe, when there was difficulty in regard to food for coolies on the works, until towards the close of the distress, when, to get rid of it, it was served out to the coolies on works, the paupers in poor-houses, in some few places to those on village relief, and, still later on, it was sold by auction and retail at a slight reduction below the market-rate to the general public. The only inducement held out by Government to private traders was, I believe, their allowing them to cart grain to markets in the interior at contract transit rates, Government being at the time virtually in possession of nearly the whole of the disposable wheeled carriage of the ceded districts. I do not think that the merchants availed themselves, to any considerable extent, of the assistance offered. The larger men sold at the stations where there were railways, and left purchasers to carry away the grain for themselves, and the smaller merchants were imbued with the feeling, which was then very prevalent, that Government were importing the grain in order to swamp the traders and snatch away their profits. The Government sold their grain in order to get rid of it, as it was no longer required. The information as to prices, &c., I cannot furnish. My successor in Cuddapah will no doubt give these; I can however speak of the general effect of the transaction. I have no doubt that the simple fact of Government having stored such a large quantity of grain, as they did, at points distant from the rail, prevented the petty merchants running up prices much more than they would otherwise have done. At the same time the large importers would not bring rice into those parts of the country where Government had stores for, as they said, "We cannot tell what the next move of Government may be, when they may not change their policy, or when they may not suddenly determine to throw their rice into the market and swamp us." I consider that Government began to dispose of the rice too late. I would have done so earlier. I think that it was a mistake to hold so long as was done. I believe that the principle acted upon was right enough and that the measure had, generally speaking, a good effect. Had it not been for the knowledge amongst the traders that Government had a reserve of rice which, if the merchants ran prices up to extreme famine figures, would be used, I believe that rice would have sold for half a rupee, if not more, a local measure (132 tolahs). I cannot say whether, if I had to deal with another bad time, I would lay in a stock of rice. I was never asked for any opinion by Government and have never had time, since I began famine work, to think the subject over.

Mr. Grose.—The following purchases of grain were made in this district:—Paddy 110 tons at Rupees 8,851, rice 1,909 tons at Rupees 3,13,049, cholum 137 tons at Rupees 18,196. Besides this about 5,508 tons of rice, costing Rupees 6,89,416, were imported from Madras. The chief items of expenditure were—

	Tons.	Costing. RS.
Sent to taluks for relief purposes - - -	1,976	3,29,862
Do. Cumbum in Kurnool - - - -	2,403	3,04,398
Delivered to Department of Public Works for use on their works -	2,558	2,95,694
Sold by retail after the famine - - -	572	64,055

At the beginning of the famine stocks on hand were believed to be small, partly because there had been bad seasons before, and partly because prices were so high that they seemed only accountable for on this hypothesis, and there was such a rapid export to the ceded districts that the then collector was led to fear that an insufficient quantity would be left. Afterwards there was a scarcity in Kurnool, and Government caused grain to be landed in Nellore for that district, and there was an enormous number of workmen on the Buckingham Canal where the markets are few and small, and grain was required for them; and when the south-west monsoon failed, the stocks which had not been replenished having been further depleted, importation by sea having almost stopped because of the prevailing winds, whilst the relief-camps were filling rapidly, I considered it necessary to purchase rice for the camps. At this time, too, I expected scarcity of grain to be felt in several outlying portions of the district, but we were saved from this no doubt by unrecorded importations by road and canal.

No attempt was made to import rice for the sake of selling it at less than the market-rate, or to induce merchants to import by bonuses. High prices were a sufficient inducement to them as long as the weather, &c., was suitable for importation.

It is only when private importation is unequal or likely to be unequal to the supply of the people that Government should import, and even then they should not sell below the proper market-rate.

Mr. J. G. Horsfall.—Grain was purchased in the local markets and delivered to the Public Works Department for the people employed under them. This was done to a very limited extent only.

Clauses 2 and 3.—No; Mr. Sewell gives the following account of the only instance that occurred in the head assistant's division:—

At the beginning of the famine, when the prices became abnormally high, the lower orders in the towns became riotous, broke into grain-shops, and looted the merchants. They behaved in so threatening a manner that they prevented the merchants from sending their goods out of the town, because they had a foolish mistaken idea that the merchants were going to sell off all the grain in the town to other people and were not going to get in any on return. The mob therefore determined to prevent the exportation of grain thinking that they would then be well supplied. The great centres of trade about this part of the country are Ellore (Godavari), Bezwada, Masulipatam, and Jaggayyapet. In all these towns disturbances occurred. In Ellore and Masulipatam loots took place. In Bezwada and Jaggayyapet the merchants were threatened and dared not send loaded carts off the towns. This block lasted some weeks. In consequence of this the merchants in the villages had no means of restocking their small stores, and when their stock was sold shut up their shops. The villagers were for a few days in the greatest distress, and I met people constantly who held up to me silver coins and declared that they could not buy grain. This really was the case. Moreover, the ryots who had stores of grain of their own were so afraid of being looted that they absolutely refused to part with even a single seer fearing that in the excited condition of the populace the mere display of grain might lead to their whole stores being looted. This was no unfounded fear. At that time the country was in a ferment of terror at the prospect of the scarcity before them and of rage at the behaviour of the grain-owners in raising prices. This rapidly quieted, and the prevailing tone throughout the famine has been one of silent despairing acquiescence in the decrees of fate. Then things were very different. General popular excitement was the characteristic of the time and loots of bazaars in the towns and dacoities on ryots' stores in the country, absolutely locked up all the trade of the district, so that the people of the villages were starving with money in their hands. Just at this time I sent out all the revenue inspectors of my division with instructions to travel at once through all their villages and ascertain the stores of grain in each village within a week. The returns I received were so startling in their nature that I conceived it my duty to ask for a Government stock of grain to sell to the villagers at market-rates. All the markets opened again. The returns I received showed that there was only about three days' food-supply in the whole of the taluks. I did not give absolute credence to this, but I dared not treat the matter with contempt. I had received the information direct from the villages, and I could not myself say that it was positively false. I accordingly telegraphed to the collector to send up grain from Masulipatam by canal. He did send up twenty candies which was sent on to Nandigama and put in charge of the tahsildar. But it happened that simultaneously with the despatch of the grain from Masulipatam the Ellore market reopened and next the Bezwada market, and the village Banians who had been waiting in the bazaar trying in vain to induce the large merchants to give supplies found themselves in a position to obtain supplies. They accordingly at once brought stocks of grain, and, with the utmost expedition, resorted to their own villages and sold it freely: consequently when the twenty candies of grain reached Nandigama the village bazaars were again in full swing and the supply was not wanted. It was subsequently sold at the market-rates to the workpeople employed on the Hyderabad road.

In another case the general deputy collector was authorized by the Hon. D. Arbuthnott to purchase 8,000 rupees' worth of grain and forward it to Kurnool. The effect was that merchants learning this went in for heavy purchases themselves, and the prices rose tremendously in the course of a week.

It is only in a case like that instanced by Mr. Sewell that Government should go into the market at all.

Mr. Martin.—There was no interference with the trade of the sort alluded to in this question, nor do I consider that it would have been better to have done so.

I communicated to the trade freely my ideas of what would be required in the way of supply for the markets, and I ascertained that they would appoint agents for the distant markets. The supply was managed satisfactorily, but occasionally caused me considerable anxiety.

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If I had the establishment that I advocate to represent the exact state of the markets in time and to see that substantial traders actually brought a sufficient supply each market-day, I should have been happier, for I knew that the railway was bringing in nearly enough for current wants, and the stocks and imports by other routes formed an ample supplement to the railway supply.

Mr. Lewis Moore.—Government did not in the Trichinopoly district during the late famine lay in stores of grain for any purpose. I consider that it would most decidedly not have been advisable to do so. Trichinopoly is a district remarkably well provided with roads, and is also traversed by the South Indian Railway in two directions. Under these circumstances I think that it will be found that private trade will always be able to do all that the district will require in the way of procuring the required supply of grain, and that Government interference will never be found to be necessary.

Mr. Fawcett.—Stores of Government grain were laid in in this division for the purpose of feeding laborers and inmates of poor-houses.

None was stored up for any other purpose. No advances were made to merchants to stimulate trade.

The grain was all imported by my predecessor Mr. Farmer. The reason why it was imported was that there was no grain in the markets for the coolies to buy, and private trade was not sufficiently active to supply the deficiency.

The total quantity of grain imported into this division was 8,657 tons; of this 4,411 tons were got through the Government agent, and the remainder, 4,246 tons, through local merchants on contract. The total cost of the grain imported was Rupees 13,54,714. Of the grain imported 6,635 tons were used on works and in poor-house, and 1,422 tons were sold for Rupees 1,30,976. The balance, 600 tons, was destroyed by damp or otherwise or stolen.

This importation only checked imports to this extent, that all the biggest of the local merchants had as much as they could do for some months to fulfil their contract with Government and had no time to import any grain on their own account.

On the whole I think importing grain in large quantities for the purpose of feeding people should never be resorted to except in places which, like this, are far from any market and where private trade cannot be depended on. Even here I think it a wasteful system, and consider that it would be a far better plan to enter into contracts with local merchants, giving them advances if necessary, for the supply of as much grain as was wanted at certain rates at certain places. This system, too, besides saving Government the risk of loss by theft or damage, would have the benefit of requiring no special establishment, whereas the grain establishment here cost Rupees 228 a month.

Mr. H. T. Ross—In the recent famine 3,862 tons of grain were forwarded by Government (through their grain agent) to Penukonda taluk, where also 167 tons locally purchased were stored. In Hindupur taluk 1,008 tons locally purchased and in Madaksira taluk 999 tons locally purchased were also stored. The origin of these transactions, as recorded in the orders of the Board of Revenue, of Government, and of Mr. Thornhill, to whom the grain operations in this district were at first entrusted, was (1), the resolution to pay grain-wages on works and to distribute grain to the recipients of gratuitous relief, and (2), the desirability of forming a small reserve in case of any temporary failure of supplies in the markets of a division so far from the railways as mine. For this latter purpose a comparatively small quantity, say, 500 tons, was sufficient, and the remainder of these large stores constituted the quantity which it was originally intended to expend in the feeding of laborers and those gratuitously relieved. Had this original intention been adhered to, the whole of the grain (barring a reserve of, say, 500 tons) would have been utilized during the famine, and the financial loss which has resulted from abandoning this original intention would never have occurred. But hardly had the stores been formed when the policy of paying grain wages was cancelled, the whole quantity supplied by Government was said to be a reserve, and the result was that, while lakhs of cash were being spent on the very purposes for which the grain was originally stored, an unnecessarily enormous reserve was lying useless in the local depôts. When the relief operations were practically over and Government considered it to be the right time to begin getting rid of these stores, viz., in December 1877, there were on hand 2,732 tons of grain to be sold; of this quantity 826 tons, which cost Rupees 1,14,054-5-5, have been sold up to 1st July 1878 for Rupees 98,139-6-7. There has thus been a monetary loss so far of Rupees 15,914-14-10 as the result of changing the whole store from its original character to that of a reserve, and of deferring the sales (when it had been determined not to distribute the grain in wages and rations) until so late a period as December 1877, against my most earnest representations based on a local knowledge of the local markets. It is a moderate estimate that the transaction in these respects will cost the State at least a further half lakh of rupees before the remaining grain is disposed of, without taking into consideration the heavy expenses of keeping up stores and establishments over so long a period, all of which would have been avoided had the grain, as originally intended, been disbursed in wages and rations, or had the sales which I commenced on my own responsibility in June 1877 been continued instead of being stopped and deferred till the next December. On 5,000 bags which I then sold a monetary *gain* of Rupees 5,665 was realised, there was a keen demand and a real want of the grain by local merchants for the local markets, and it was unquestionably the time to begin selling with advantage to the people as well as to the Government. As regards the State, the general effect of the transaction, as it has been conducted here, has thus been to cause a heavy financial loss, owing (first) to the abandonment of the original object with which the grain was stored, and (second) to the deferring of the sales to a time when the grain was not wanted for the local markets and could not be disposed of except at a loss. As regards the people and the local private trade, the general effect of the transaction has been perfectly harmless, and it has not checked private imports in any way.

In making the local purchases here, advances of money were given to a few of the more respectable traders to bring in grain, at current market rates, to the local stores, but no bonus of any kind was given.

I do not think that any error was made in the original purchase of grain for distribution of grain-wages and rations instead of money payments, and it was a wise measure to establish a reserve in a division situated as this is, but this reserve need only have been a small one, and the fundamental error made was the conversion of the whole stock originally intended for distribution into an unnecessarily large reserve.

Mr. Weekes.—No. In the Madras Presidency I found some grain already stored in my division, but not a very large amount. No stimulus was given to trade except an advance to ensure regular purchases for camps. The Government did not import enough to enable them to sell to supply the markets. In Chumparun in 1874 I had an immense quantity of grain under my charge, but would not sell, and expended it all either on works in wages and gratuitous relief and for spinning and weaving (a small quantity) or in advances to ryots (the greater portion). In Madras fewer persons have land than in Bengal, and the laborer classes are more numerous. But the question applies to this famine. I may perhaps here mention, though it is not *à propos* of the question, that I believe such advances as I made to all the ryots of a village on their joint and several responsibility to an

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extent depending on each man's means and ability to repay is a first-rate plan to manage a famine. I believe all my advances were repaid, and collectively they were very large.

I am inclined to think that Government importation is more effectual than private, and, in a case like the Orissa famine, or in a case as would have been if famine had lasted longer in Madras, ought to be undertaken. Government can work as no individuals can, and there is the risk of empty trains starting on some days, and of partial distribution to favored places through combinations and intrigue. But there is great chance of waste and little definite knowledge to go upon. There are cases in which a railway worked night and day would be insufficient to carry enough food, and in such cases private importation would be not to be thought of.

Mr. Oldham.—I took none of the measures referred to in this paragraph last year. I objected to Government grain being sent to me. I do not now consider that it would have been better to have adopted any of these measures, or even to have received Government grain already purchased.

Generally the conditions under which such measures are necessary depend on the accessibility or isolation of the tract to be provided for.

For Orissa in 1866 such measures were indubitably necessary; or, to take a disputed instance, I believe that they were necessary for the sub-Himalayan tracts of North Behar in 1874, but not for the southern parts, nor for any part of South Behar.

Mr. J. H. Cook.—During the famine I had no stores of Government grain for feeding laborers or inmates of poor-houses. The supplies for the poor-houses were made by contract, which was put up to open competition. No advances, assistance, or bonus was made to the merchants, nor did Government purchase, import, or sell grain in this taluk. None of the above was at all necessary in this taluk, for the merchants were very enterprising.

Hurry Row.—To meet emergencies Government should have stores of grain, but it should be never sold to interfere with an honest market, but to put down malicious and cruel combination or monopoly of bad grain-dealers.

MYSORE.

MYSORE.

Mr. Ricketts.—No stores of Government grain were laid in for the purpose of feeding labourers or inmates of poorhouses. Nothing was done to stimulate trade by offering advances or assistance to merchants. I know of no conditions under which it would be proper and necessary for Government officials to perform the part of grain merchants. Such difficulties as would have to be encountered by the latter in putting down grain at any particular place "would similarly and perhaps to a greater degree have to be encountered by Government officials. In an extreme case the action of Government officials in this respect might produce temporary beneficial effects, but no ultimate good would be effected, but rather the reverse. Whereas the action of persons skilled in trade and knowledge of the markets and working from the most powerful of motives, self-interest, is certain to have the effect (operating almost as a natural law) of developing the grain market in the most favourable and lasting manner.

QUESTION 40.—CAPACITY OF ADMINISTRATION TO COPE WITH FAMINE EMERGENCIES.

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Do you consider that the events of the last famine have shown that the system of civil administration in your district is strong enough to bear the unusual strain laid upon it, or that any defects have been discovered which might be obviated? Is the area of your district too large for one man to supervise, or of a convenient size? Are your official relations with the officers of the Public Works Department in your district such as are most conducive to the carrying on of relief work? What staff of civil officers have you to carry out your orders, and what duties and responsibilities attach to each? Is that staff of the proper strength and organised in the best possible way, or can you suggest any improvements? Have your native subordinates as a class shown energy, capacity, humanity, and physical activity in carrying out relief measures, or have they been wanting in these qualities? Give a general outline of the manner in which the relief operations in your district were conducted. To what extent did your control go; to what extent was there local independence of action? How was the chain of responsibility maintained between the superior and subordinate officers? How far were you yourself controlled in the relief administration, and how far left to act on your own discretion?

Punjab.—Staff sufficient with some additions for relief work. Relations with P. W. D. amicable. Native subordinates favourably reported.

North-Western Provinces.—The opinion is expressed that the executive officers should be relieved of judicial work. Otherwise the district staff is ordinarily sufficient, but requires supplementing in famine. The Native subordinates are generally favourably reported.

Bengal.—The ordinary civil staff is not sufficient to meet the extra work of famine administration. The Native subordinates are favourably spoken of in most cases.

Bombay.—The civil staff of the district is generally held to be strong enough for ordinary occasions, but it requires strengthening for famine work. The Native subordinates are reported of favourably. A large discretion was left to the collectors under the general orders of Government.

Madras.—Sixteen European and one Native gentlemen have replied.

The ordinary public establishments must be largely expanded in famine, especially in the Madras Presidency, where the large size of the districts renders the administration of famine relief a task of peculiar difficulty.

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PUNJAB.

PUNJAB.

Mr. Gore Ouseley.—The only divisions in the Punjab which were affected by scarcity last year were Delhi, Hissar, and Hazara, and in none of these did the famine last long, nor was it of a very aggravated form. In all these divisions the system of civil administration was found, with the little strengthening which the Government considered it necessary to afford to it in the shape of sending a few extra European assistants and some native tahsîldârs, sufficient to bear the unusual strain laid upon it.

The rest of the interrogatories in this question may be answered in the negative so far as they raise doubts respecting the judiciousness of existing arrangements, whilst it can be confidently stated that the official relations of the districts and of the Public Works Department officials were conducive to the efficient carrying on of relief works, and that the native subordinates as a class displayed energy, capacity, and humanity and physical activity in carrying out relief measures.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—The civil administration of this district was strong enough to bear the strain of the failure of a single harvest, but it would not have been so had there been a complete failure of the rabi.

My official relations with the officers of the Public Works Department have been satisfactory.

None of my native subordinates have been employed in carrying out relief measures. A few school teachers have been employed as munshis and a deputy inspector of schools as a cashier, and in these capacities have worked satisfactorily. The relief operations have been conducted by a district engineer, who has had the services of—

1 assistant engineer.
1 apprentice assistant engineer,
7 suboverseers,

at his disposal.

As stated in answer to question 38, Chapter III., contracts were in the first instance given to zemindars or headmen of villages whenever they would take them, on the condition that they gave work to their cultivators or residents in their villages. The task-work system was adopted and payments made weekly on measurements, while daily payments were enforced from the contractors to their labourers. Before the heavy rain fell in the beginning of October the contractors were allowed Re. 1-12 per thousand cubic feet, and where the earth was very hard 2 per thousand cubic feet; out of this Re. 1-4 per thousand cubic feet was ordered to be paid to the labourers for undressed work, the balance being available for dressing and contractor's profits. The labourers were able to earn from Re. 0-1-3 to 0-2-0, according to their strength, and a fair quantity of work was done.

After the heavy rain at the commencement of October most of the people employed on the relief works left to plough and sow their fields, and the following reduction in the rates took place per thousand cubic feet:—

	Rs.	a.	p.
For sand - -	1	8	0
For soft soil - -	1	10	0
For hard earth - -	1	12	0

In the middle of December, when the days were short and the cold severe, daily-labour gangs were started, in addition to the works carried on by the contractors, so that all who were too weak to work on the task-work system might obtain a bare subsistence allowance by coming or being sent to them.

None of the sanctioned relief works were taken in hand without my sanction, but when started the district engineer gave the contracts to any of the persons named above who might be sent to him by my order or who came to him of their own accord. I had taken care to make it well known by whom such contracts could be obtained. For the tasking, measuring, and payment of wages the district engineer was responsible, and under him the two assistant engineers were responsible, in the like manner, for the works under their immediate charge.

Sanction of Government had to be obtained before any work could be taken in hand as a relief work. But such sanction having been accorded, I was left to act on my own discretion as to the number it might be necessary to take in hand at any particular time while the pressure of the distress lasted, and until 31st March. After this date the relief works were closed, and not again re-opened until June, when orders were issued that the commissioner of division's sanction was necessary before commencing on any of the sanctioned works.

Captain Currie.—The fault in the system of the civil administration of the district is that executive officers are too much tied down by judicial work. The strength of the district staff is at present inadequate to properly perform its ordinary duties in an average year.

The district is of convenient size, and not too large for one man to supervise. My relations with the Department Public Works officers are of the happiest. I have for the city itself a city magistrate; for the district, a treasury officer whose whole time is occupied with treasury work and supervision of abkâri, stamps, opium, and the trial of all abkâri, stamps, opium, and customs cases, and such matters as cotton report, &c.; an assistant commissioner, and an extra assistant commissioner and three tahsildars. The staff is of proper strength if only relieved of all civil judicial work; it is quite inadequate for what is required of it at present. My native subordinates have shown themselves energetic, capable, humane, and active, and have worked hard and well. The relief operations in this district consisted of earthworks for those who could work. On these works gangs were told off according to their capabilities. At the tahsils and at the sudder we had poor-houses as feeders to the relief works. The district engineer reported direct to me, and I reported direct to the commissioner. I had very little left to my own discretion, as the works were arranged in committee, and the commissioner controlled the rates to be paid, &c.

Mr. Lumsden.—I do not quite understand what is meant by "the system of civil administration" bearing "the usual strains laid upon it" in famine times. I have no exception to take to the system of civil administration, except that, in my opinion, in time of famine a sufficient number of civil officers should be relieved of all judicial work for employment on famine duty. The district staff is certainly not strong enough to bear the strain thrown on it in time of famine; it is barely strong enough for the prompt and efficient discharge of ordinary current work. Both the civil and department public works staff must be largely strengthened when famine occurs.

The area of none of the districts in this division is unmanageably large; but when the distress is very severe, and continues for any length of time, I do not consider the district officer can efficiently look after the famine administration and carry on all the ordinary duties of his office.

I have found nothing in my relations with the officers of the Public Works Department to interfere with the successful working of famine-relief administration. It must be understood that every Public Works Department officer in a district, except as regards departmental matters, is under the orders of the district officer, and the latter under the orders of the commissioner in all matters connected with relief works; if this is thoroughly understood, no difficulty should arise.

It is needless my detailing the staff of civil officers attached to the districts of my division. Government are well aware of the nature and strength of the staff.

As to organisation of staff, the only suggestion I have to make is the separation of the judicial from the executive branch, a measure which is about to be given effect to.

As regards the conduct of native subordinates, I should say that, as a class, they have not displayed the qualities alluded to; at the same time, I could name some native subordinates who displayed these qualities beyond all praise.

The relief operations, as conducted in each district, will doubtless be described by the deputy commissioners in answering this question. I do not know that it is necessary for me to say more than that relief operations have been conducted generally in accordance with the rules laid down by the North-Western Provinces Government.

At first, however, in the Rae Bareli district, relief works were started under the supervision of civil officers only, and advances were given free of interest to certain talukdars and zemindars to carry out works of improvements which would at the same time afford labour to the unemployed poor. During the recent famine relief may be said to have been given in the following forms in the Rae Bareli districts:—

(1.) On Government relief works managed by Public Works Department officers.
(2.) On Government relief works managed by civil officers.
(3.) On talukdars' and zemindars' relief works, carried out in some instances with funds advanced by Government, in others with funds provided by the talukdars themselves.
(4.) At Government poor-houses.
(5.) Gratuitous relief to pardah-nashin women at their homes.
(6.) Suspension of the land revenue.
(7.) Advances to cultivators for purchase of seed-grain and plough cattle.

My own powers of control may best be described as being those of general supervision. I had also the power as commissioner to sanction the opening of any relief work for which the provisional sanction of Government had been obtained, or, in the event of sudden emergency, to order the commencement of any work for the purpose of giving occupation to the people.

I have also exercised control in directing the closing of one work and the opening of another in order to enforce the distance test, and generally in seeing that the standing orders of Government were being complied with.

The duties of a commissioner in Oudh are very laborious; his judicial work ties him very much to his office, and he is not therefore able to exercise such active personal supervision of relief works as might be desirable. As a district officer in the North-Western Provinces, I was able to do much more in this way than I found it possible to do as an officiating commissioner in Oudh. On the other hand, the executive engineer was able to undertake much of this for me.

As to the extent I was myself controlled in the matter of relief administration, I had to submit the district officer's weekly reports, adding my own remarks, to Government; and in submitting these reports it was my duty to call attention to any points calling for the special orders of Government. I have always understood that in any emergency I might act on my own discretion, reporting at once to Government, provided no action was taken contrary to any of the standard rules without the previous sanction of Government. I have never felt that I was hampered injuriously from not being able to exercise a reasonable discretion, except as regards the rates of wage which were introduced under the orders of the Government of India. I had no power to sanction any departure from them, and I was bound to see that all applicants for work were taken on; the consequence was that, for some six weeks or so, a number of people were attracted to the works who really did not stand in need of relief at all. To this matter I repeatedly drew the attention of Government in my weekly reports, and at length the rates were reduced, with the result I had predicted—an enormous reduction in the numbers.

Mr. Blennerhassett.—No defects in the system of civil administration are apparent; the system is, on the whole, a strong one; temporary assistance was borrowed from neighbouring districts; the area of the district is not too large for ordinary duties; official relations with the Department Public Works are satisfactory; the native subordinates have not been wanting in good qualities, but supervision is necessary to ensure some energy and intelligence; the chain of responsibility was the ordinary one, and relief works in general were carried out in accordance with circulars of the Government. The civil officers had little to do with the relief works, the public works officers being chiefly responsible. A good deal of local independence appears to have been left to the overseers and gangsmen.

BENGAL.

Bengal.

Mr. Worsley.—The events of the famine of 1874 showed that the system of civil administration in this district was not strong enough to bear the unusual strain laid upon it. Between the subdivisional officers and the people a class of officers is required such as I have more than once proposed, viz. an officer in charge of each thana jurisdiction, vested with 3rd-class powers of a magistrate, the powers of a sub-registrar of deeds, the powers of a canoongo (for supervising putwaries), and the executive powers of a magistrate in regard to the supervising of chowkidaree punchyets.

The area of my district is of a convenient size for one man to supervise.

My official relations with the executive engineer of my district only relate to buildings. That officer has now nothing to do with roads.

The staff of civil officers in this district consists of—

At Mozufferpore.

The district officer.
Two deputy magistrates and collectors with full powers.
One assistant magistrate and collector with 3rd-class powers.
One sub-deputy collector.
Two canoongoes.
One district superintendent of police.
One assistant superintendent of police.
One district engineer.

At Hajeepore.

One subdivisional officer with 1st-class powers.
One subdeputy collector and magistrate with 3rd class powers.

At Seetamurhee.

One subdivisional officer with 1st-class powers.
One subdeputy magistrate and collector with 3rd-class powers.

Ordinarily a joint-magistrate is stationed at Mozufferpore and no assistant magistrate, and I presume it is unnecessary to describe the duties and responsibilities of the district superintendent of police, which are the same in all districts.

One deputy magistrate and collector is in charge of the Road Cess and Land Registration Departments and also of the Treasury. In the absence of a joint-magistrate, he has to take a large share of criminal work of the sudder subdivision.

The other deputy magistrate and collector is in charge of the Excise and Salt Departments and of the famine advance collections, has the management of all butwara cases, and takes a large share of the criminal work of the sudder subdivision.

The assistant magistrate and collector tries petty criminal cases and uncontested cases in the Land Registration Department, and is secretary of the District Education Committee.

The subdeputy collector at Mozufferpore is employed exclusively in the Land Registration Department.

Of the canoongoes, one has been employed in making famine advance collections, in collecting the rents of a Government estate, and in making local inquiries in butwara cases and other miscellaneous cases.

The other is employed as an assessor in the License Tax Department.

The duties of subdivisional officers are the same in all districts.

The subdeputy magistrates and collectors at subdivisions try petty criminal cases, take charge of the treasuries during the absence on tour of subdivisional officers, make local inquiries in miscellaneous cases, and assist in the administration of the Salt Department.

The staff at head-quarters is too weak; a third deputy collector and magistrate with full powers is required, and the station ought never to be without a joint-magistrate.

Subdivisional officers are too young and inexperienced, and changes of these officers are made too frequently. An officer with the powers described in section 46 is required in each thana jurisdiction.

The native subordinates, so far as they were employed, showed energy, capacity, humanity, and physical activity in carrying out relief measures in 1874. The tehsildars deputed here from the North-western provinces proved excellent relief officers, and worked most economically of all.

The three subdivisions—Mozufferpore, Hajeepore, and Tajpore—comprising a total area of 2,720 square miles, which were under my charge in 1874, were divided into a large number of relief circles, each circle on an average comprising about 100 square miles of country. Of these circles two were manned by officers of the Opium Department, one by a deputy magistrate of the district, one by an extra assistant commissioner from the Punjab, one by a tehsildar from the North-Western provinces, one by a police officer from the Punjab, and one by an officer not previously in Government service; while the remaining circles were all under the charge of the managers of indigo factories. The former class of officers were assisted by deputy and subdeputy superintendents, and the factory managers were assisted by their own European assistants, to each of whom a salary of Rs. 100 per mensem was paid by Government. At first the relief works to be opened were fixed by the district officer and subdivisional officers; but as the works became crowded with labourers, and applicants thronged in for employment in large numbers, the circle officers were authorised to open new works from time to time on their own responsibility. As a rule, it was my object to prevent more than 500 labourers being employed on one work, and consequently employment was provided on a very large number of tanks and village roads. In the circles manned by Government officers the rates of 1½, 1, and ½ annas per diem for man, woman, and child were generally paid; but in the planters' circles the rates were usually lower. Contract rates were in some instances paid, but to a very small extent. No poor-houses were established, but the persons fit to receive charitable relief were selected by the circle officers, and were either relieved at their homes through the headmen of villages or at the head-quarters of a circle by the superintendent or one of his immediate subordinates. The subordinate agency for numbering and paying labourers on each work was appointed on the spot. The circle officers spent their time in visiting works and checking the returns of their subordinates, and the district officer and the subdivisional officers moved constantly about the district and subdivisions, exercising such general supervision as was possible, and keeping themselves well informed of the state of the people. Each circle officer had a supply of Government grain stored at his head-quarters, and this grain he sold to the public, advanced to agriculturists, and gave away in charitable relief. At a late stage in the famine the grain was also used in paying labourers on relief works. A few native doctors were employed in some circles, but the relief measures were so effectual that they had little to do.

Practically, I was allowed to act entirely on my own discretion in regard to relief administration. The one aim constantly before each officer's eyes, from the highest to the lowest, was to prevent the death of a single person, and my belief is that scarcely a person did die in the famine from starvation.

I must here respectfully express my opinion that the failure of the Government to strengthen the hands of the local officers on the first signs of famine was the main cause of the extravagant expenditure which subsequently was incurred on relief works. Two months before any bad symptoms appeared I had asked that a second civil officer might be sent to each of the worst subdivisions of Tirhoot, but was informed that none were available. Again, during the short time I was at Durbhunga, from the middle of February to the beginning of March 1874, when labourers began to flock to the only relief work then open in the vicinity of Durbhunga, and when the only public-works officers in Durbhunga and Modhubunnee subdivisions were an engineer and two overseers, I wrote most urgently for more overseers and sub-overseers, but was told to use local agency. When at last some assistance came, things had gone too far to be easily set right again. Having seen the effects, therefore, of enormous crowds of labourers collected together on a mile or two of road near Durbhunga, I considered it necessary to avoid all risk of such evils in Mozufferpore, Hajeepore, and Tajpore subdivisions, more especially as I had no sufficient staff of public-works officers for supervising large works, and I accordingly adopted the policy of opening numerous works in all distressed localities.

The system of making advances was by far the best feature in the whole famine administration. Out of Rs. 6,74,586-11-3 advanced in Mozufferpore and Hajeepore subdivisions (I cannot speak of Tajpore subdivision, which has been included in Durbhunga district since 1875) a sum of Rs. 5,97,670 has been collected up to date, and the greater portion of the balance will probably be collected in a few months.

The appointment of planters to the charge of circles was also a great success. Being much interested in saving the lives of their tenants and labourers, and at the same time anxious to prevent a permanent rise of wages and the demoralisation of the peasantry, they were specially careful not to give relief recklessly or unnecessarily. They also possessed peculiar facilities, from their influential position, for ascertaining the actual condition of all villages in their circles.

Mr. Toynbee.—To these questions I should reply without hesitation that the system of civil administration in no district in Bengal is equal of itself to bear the unusual strain of famine-relief operations conducted on modern principles. The staff of officers ordinarily allowed to each district has its hands now-a-days more than full in complying with the demands of improved administration. The strain produced even by the indirect effects of a famine, such as the increase of crime, the collection of special information, the inspection of crops, and so on, entirely paralyses the ordinary work of district staff. The obvious remedy is to increase the staff, but this is a step of which the present state of the finances will not admit; nor would the experience of the past, as to recurrence of famine, justify the increase of the permanent staff solely in anticipation of famine. The area of the Patna district, of which I have charge, is in round numbers 2,000 square miles, and is of convenient size under ordinary circumstances. A district officer in Bengal has now hardly any official relation with the Public Works Department. Since the introduction of the Road Cess Act each district has its own engineer to supervise the expenditure of the funds raised locally, and it is in concert with him that relief works would ordinarily be carried on. It is only in times of severe famine that extraneous aid would be required from the Public Works Department. The staff of civil officers in the Patna district is as follows:—

At Head Quarters—

1 Magistrate Collector - - 1 Joint Magistrate and Deputy Collector - - -	Covenanted Civilians.
2 Deputy Magistrates with full powers - - - 1 Deputy Magistrate with second-class powers - 1 Canoongoe - - -	(Uncovenanted, two natives one European.)

At Barrh and Behar subdivisions—
Uncovenanted—
1 Deputy Magistrate and Collector with full powers (in charge).
1 Sub-Deputy Collector.
1 Canoongoe.

At Dinapore subdivision—

1 Cantonment Magistrate -	Covenanted Military officer.

Road Cess Establishment—
1 District Engineer.
2 Overseers.
2 Suboverseers.

The joint-magistrate takes the largest share of the criminal and municipal business, and has also such revenue work as the collector may give him to do; the rest of the head-quarters staff work under the immediate orders of the collector. One deputy collector has special charge of the treasury; another of miscellaneous departments, such as excise, land acquisition, land registration, and so on. The subdivisional officers have similar powers to those of a district officer within the local limits of their own subdivisions, and, with the exception of criminal work done by benches, do all the criminal and revenue work therein. I cannot suggest any improvement in the existing state of affairs, which is sufficient to meet all ordinary administrative requirements; but, as I have said before, it is not sufficient to bear the burden of famine-relief operations on a large scale. As far as my experience goes (*i.e.*, in Orissa in 1867), selected native subordinates have shown themselves well suited in every way to conduct relief operations under frequent and strict European supervision. But if this be wanting, they are apt to become lax and wanting in energy, firmness, and especially thoroughness. I should say that they were decidedly inclined towards humanity rather than to the principles of political economy. The relief operations in Pooree, in 1867, were conducted as follows:—There was a special relief commissioner for the province of Orissa (three districts), acting nominally under the orders of the Calcutta Central Relief Committee, through their President, the Honourable C. P. Hobhouse. Practically the whole control of relief was under the special commissioner. Under him was a relief manager for each of the three districts, a young covenanted civilian of two to four years' standing. Each relief manager had under him a staff of deputy collectors, inspectors, and native doctors, each told off to certain specified areas. The general control over money and grain, and the decision of principles, vested in the relief commissioner. Each relief manager was allowed full latitude in carrying out those principles into detail. In fact, the system was precisely similar and parallel to that of the ordinary civil administration of the country, the relief commissioner corresponding to the divisional commissioner, and the relief managers to the magistrate-collectors of districts. In cases of severe famine I do not think any system could be better. Ordinary local distress can always be met and dealt with by an active and energetic district officer, if his regular staff be slightly strengthened from other non-affected districts. But when real famine comes, and relief operations are on a large scale, it is essential that an arrangement be made similar to that in force in Orissa. It is impossible for one officer to do justice to ordinary work and famine work at the same time. Ordinarily the district officer himself would be the best officer to have charge of the relief operations, routine work being done by a junior. In any case he should be consulted by the special officers in all matters affecting his district, both of principle and detail.

Mr. Marindin.—In the Durbhunga subdivision of the Mozufferpore district during the famine of 1874–75 the relief administration was in the hands of the subdivisional officer, who was (for relief purposes) immediately under the authority of the additional commissioner. The subdivision was divided into circles, each circle being placed under the charge of a circle officer who was under the control of the subdivisional officer. I was in charge of a circle which comprised about 130 villages, small and great, *i.e.*, population of about 100,000. For the purposes of gratuitous relief this circle was divided into 10 subcircles, in the most central village of which there was a small grain golah located, capable of containing about 150 maunds of grain at a time. These small golahs were supplied from one or other of the two central golahs in this circle. The supply of the central golahs was managed from the subdivisional headquarters by the transport officers, the supply of the small golahs was managed by the circle officer. To each subcircle there was appointed a mohurir in charge of the golah, and an inspector. It was the duty of the inspector to visit continually the villages in his circle, to search out and report any case requiring relief that came to his notice, and report any case where relief was being erroneously administered, to the circle officer.

The lists were made out for each village every week according to their report, and an order given to the mohurir in charge of the subgolah for the issue of the requisite portion of grain. The mode of distribution was through the jeyt ryots of the village. A week's supply according to the requirements of the villages was given to the jeyt ryot, who distributed it in the village to the persons on the list. By this course large assemblages of persons at the golahs were avoided. We also looked to the jeyt ryot to bring any case requiring relief to the notice of the inspector. The wages of the inspector were Rs. 15 a month.

In addition to these duties, he had charge of the issue of cotton for spinning to Brahmin and other women of respectable castes.

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Bengal.

At two central places in the circle in the vicinity of the central golahs there were poor-houses where wandering beggars, orphans without friends or relatives, and persons found too weak to labour on the works were taken in and fed. As far as I remember, the number in the Bahera poor-house, which was always fullest, never exceeded 50. There was a native doctor in charge of each.

There were, besides gratuitous relief, two classes of relief works, one under the Public Works Department and one under the circle officer. The circle officer had no control over the Public Works Department works; he could only report anything requiring notice to the subdivisional officers. The returns of the numbers employed on these works were sent to the subdivisional officers through the circle officer.

The works under the circle officer were village works, and consisted principally in deepening old tanks or constructing new ones. These works were placed in charge of a resident malik or a principal ryot in the village, through whom the workmen were paid. Later on the services of an apprentice in the Public Works Department were placed at the disposal of the circle officer to assist him in supervising their work. In addition to these two modes of relief (gratuitously and on works), advances in grain and money were also made to the cultivators and zemindars. These were made by the circle officer. Unstamped bonds were taken from the recipients; in many villages the zemindars received advances on behalf of their ryots; in others, the principal ryots combined to take advances on their own behalf and on behalf of the poorer cultivators who had no security to offer; moveable and immoveable property was pledged as security, and in cases of doubt inquiries were first made as to its existence. All these advances were (I believe) recovered. In a few instances money was advanced for works of utility, such as tanks and wells. This village-relief system kept the people in their homes and prevented them congregating in large numbers at central places, thus avoiding the danger of outbreaks of cholera and other sickness. It ensured relief being brought to old, sick, and infirm persons. It met the case of those who would prefer dying of starvation to seeking relief in a poor-house. There was no chance of persons trying to hold out against starvation too long, and eventually dying on their way to the poor-house or in search of it. The relief of the people was entrusted to those who, from dread of public opinion and motives of personal gain, were interested in administering it. As you must have village inspection and relief for sick and infirm persons, it is less likely to give rise to complications if persons generally needing gratuitous relief are included in it. A village inspector might insist upon persons finding their way to the poor-houses who were not physically fit to do so. On the other hand, there were great opportunities for peculation by collusion between the paid inspector and the jeyt ryots, which it was difficult to check. There was absolutely no return made by the people for the food given them, and relief was made too easy for them. This was the greatest drawback, but I think on looking back that, after the first rush of work was over and the subcircles organised, something more might have been done in this direction. The most unsatisfactory part of the relief administration was the work upon village tanks. Until a professional assistant was given him, it was impossible for the circle officer to check the work on all the tanks in his circle, and he could not delay issuing money for payments to the persons in charge until he had satisfied himself of the character of the work done. The result was at first considerable peculation. Afterwards, when I had the assistance of a Public Works Department apprentice, and also of five or six duffadars (trustworthy men) whom I employed for this purpose, it was possible to keep a check on the expenditure. I would argue from this that it is absolutely necessary to give a civil officer proper assistance if he is to look after and supervise relief works, otherwise misappropriation of the public money must take place upon a considerable scale.

Bombay.

BOMBAY.

Mr. Hewlett.—The only point in this paragraph I need notice is to take the opportunity of expressing my conviction that, although native officials do very well as subordinates, they do not possess sufficient power of organisation to qualify them for being entrusted with an independent charge. The difference in relief arrangements in talukas under European officers and those under native officials was most marked. There should be, in my opinion, an assistant collector in charge of each taluka, and he should have a staff of European assistants, the native officers being relegated to other duties. The more European supervision there is of village inspection, so much the more thoroughly will the work be done. A European assistant should not have more than 50 villages in his beat; a staff of five supervisors and 10 inspectors should be allowed under him. The immense importance of a rigid village inspection cannot, in my opinion, be too much insisted upon.

Mr. Norman.—The events of the last famine showed most clearly that the ordinary civil administration of the district is insufficient to bear the unusual strain of a famine. The area of the district is not too large for one man to supervise, provided he has a sufficient number of subordinates under him. I have always been on the best terms with the officers of the Public Works Department, and we worked together without any hitch arising.

The ordinary staff of the district consists of a collector, two or three covenanted assistants, an uncovenanted assistant, who is city magistrate, and a deputy collector in charge of the accounts. There is also a mamlatdar in each taluka. In case of a severe famine there should be a special mamlatdar appointed in each famine taluka, as well as a special European assistant. In the larger talukas, where a mahalkari now exists, a special mahalkari should also be appointed. The officers of the survey department are admirably adapted for famine duty, because they and their subordinates possess an intimate knowledge of the people and of the country. The native subordinates under me, with very few exceptions, worked admirably. In this district, as far as possible, a European assistant was given charge of one famine district. He had under him a special mamlatdar, and in one of the talukas a special mahalkari as well. A few extra karkuns, overseers, and native doctors were also engaged to lay out and superintend civil agency works, and to attend to the sick. As the famine increased in severity village inspectors were appointed, whose duty it was to visit every village in their respective circles and report to their superiors. All orders were issued by me in the first instance. No works were commenced without my sanction, but with that exception my assistants were left to battle with the distress as best they could, acting under the general instructions of Government. They were also required to submit a weekly diary for my information. In the same way, I was controlled by the commissioner and by Government. But on me rested the responsibility of doing my utmost to alleviate distress. I considered that very great discretion was vested in me, and I should not, and did not, hesitate to undertake measures involving a large expenditure when I considered the same necessary. Government placed the fullest confidence in the collector, and as long as we acted on general fixed principles we were not interfered with.

Mr. Spry.—I think that the system of civil administration of my district is good enough. When any unusual strain such as famine comes, the system is equal to it, only it requires strengthening by increased establishments.

The area of the district is 5,695 square miles, and it is compact in formations except for one outlying jaghir (Gajendragad), containing 27 villages. It is not too large for one man to manage, except that in times of famine the extreme pressure of important work will prevent that one man from going about much and personally supervising. That must be left to trustworthy subordinate officers.

My official relations with the P. W. D. officers have generally been conducive to the carrying on of relief work; when they have not been, the peculiarity of the individual rather than the system has been at fault.

There are eight talukas and one petta in the district. In each of the former there is a mamlatdar and his first karkun, and in the latter there is a mahalkari, who is immediately subordinate to the mamlatdar, to whose taluka his petta is attached. All these officers have either second or third class magisterial powers for the conduct of criminal work. They have also to conduct the duties of realising the revenue, of keeping the accounts, and of general revenue administration, under the orders of their superior officers.

There are also—

One Huzur deputy collector, who has charge of the treasury and account department, and has also first-class magisterial powers. He also takes the place of the collector at headquarters, when that officer is on circuit.

Two assistant collectors and one district deputy collector. The former have revenue charge each of three talukas, and are also divisional magistrates within their charges. The latter has revenue and magisterial charge of two talukas.

Further, there is a superintendent of police, who has immediate control over his department.

Some of my native subordinates have shown energy, humanity, and physical capacity in carrying out relief measures; others have failed most lamentably, and especially some who, having got as high in promotion as they could expect, have had no incentive for further exertion.

The villages were all divided off into circles, over each of which was a circle inspector, who had to see that the village officers looked after relief measures. In some cases divisional inspectors were nominated, who had each a number of circles to supervise. Over the whole number of circles in a taluka was placed the relief mamlatdar, who also had generally to supervise all the relief houses. An assistant or deputy collector then had charge of each taluka, who supervised all relief operations, including the relief houses, hospitals, and civil agency gangs. In some places, where the pressure of famine was greatest, revenue survey officers were appointed to assist the assistant collectors generally, and particularly to look after relief houses and people under special treatment. The relief houses were immediately supervised by committees, consisting partly of official and partly of non-official members. There were also a certain number of town inspectors, road patrols, &c., all under the orders of the relief mamlatdars and assistant collectors.

My control consisted in issuing instructions and orders for general guidance, and in deciding matters on reference. Local independence of action was given to the officers in charge of talukas so far as that action did not militate with instructions and orders. Matters of detail could be settled by them, and others of importance were referred.

All officers in charge of talukas sent to me weekly reports of their proceedings and of matters relating to relief in their respective charges. The relief mamlatdars and special officers reported in the same way to the taluka officers, and the inspectors to the relief mamlatdars.

Nominally and to a certain degree I was controlled by the commissioner, but I had the widest discretionary power given me, and I was informed by Government that I was "absolutely responsible."

Mr. Moore.—I think our system is strong enough for ordinary years, and that in extraordinary years we only want a little extra assistance. (2) The area of the district proper is not I think too large, but the Political jaghirs attached made the work somewhat heavy. (3) I think that the Executive Engineer should be placed on the same footing as regards the Collector as the District Superintendant of Police. I think that the correspondence between the Executive Engineer and the Superintending Engineer and Government should pass through the Collector's office, so that the Collector might be kept better informed as to what is going on in the district. At present no such information reaches him; he has to find out for himself what is going on. (4) The civil officers at my disposal are as shown below—

1st.—Assistant Collector and Magistrate, F. C., in charge of the talukas of Satara, Jauli, Wai, and Koregaon.

2nd.—Assistant Collector and Magistrate, F. C., in charge of the talukas of Karad, Patan, and Khairapur.

Extra 2nd Assistant Collector and Magistrate F. C. in charge of the talukas of Walwa and Tasgaon.

District Deputy Collector of Khatau and Man.

Supernumerary Assistant Collector and Magistrate 3rd Class.

Huzur Deputy Collector and Magistrate, F. C.

Superintendent of Mahableshwar and Magistrate, F. C.

Superintendent and 3rd Class Magistrate of Panchgani.

In addition to the above there are 11 Mamledars (one for each taluka), 2 Mahalkaries (one for the Khandála and the other for the Shirála petas), 11 awal karkuns, with other establishment under each of the eleven Mamledars, also village officers, viz., patels and kulkarnis. All of these officers perform the revenue and magisterial work for their respective charges.

Mr. Percival.—The Sholapur district is of a convenient size and is divided into the right number of talukas. It is 4549·11 square miles in extent, and has a population of 718,000 persons. No change in the administration or the staff is suggested by the famine, nor in the relations between the departments. The native subordinates showed great activity in relief operations; capacity and humanity varied with individuals, but were on the whole good. Relief was first given by opening small works all over the district about the middle of September. Supervision was insufficient and the numbers ran up till in January there were 76,000 persons on works under civil agency, and those under P. W. department had fallen from 33,000 to 20,000. The civil wage was then lowered and the small works gradually closed; but though the numbers on civil works fell to 4,000, those under the P. W. department never rose above 50,000. The ordinary civil staff for the district consists of two assistant collectors and a deputy collector in charge of the treasury. Under them are taluka officers and their establishments. In each village are a headman, an accountant, and village police and servants. The district police are under a European superintendent. During the famine this staff was increased to five assistant and three deputy collectors, so that there was one in each taluka. An extra mamlutdar or taluka officer was appointed in each taluka for famine purposes, with an establishment including subordinate

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medical officers, suboverseers of works, and village inspectors. They were expected to move actively about their charges, to search out all cases of distress, and to carry out all the orders of Government for giving relief. The authority of the collector over these establishments was complete. His discretionary grant for charitable relief of the infirm poor was unlimited. He was directed not to open new works without first obtaining the sanction of Government, but practically he had often to do so in anticipation of sanction. He was expected to keep Government thoroughly informed of all that was being done, and he received full general instructions. His work was under the direct supervision of the commissioner of the division, who visited the district frequently; the works and poor-houses were reported on by the sanitary commissioner, and his Excellency the Governor was himself at Sholapur several times during the famine. With regard to the works under the P. W. department, the collector had to keep himself informed of the numbers upon them and of the probable requirements, and to apply for the opening of works where needed. The P. W. department was strengthened by several engineers. The collector was also president of the Famine Relief Committees which were established in every town. The action of these Committees was independent of Government, but Government officers were leading members of them and watched their proceedings.

Mr. Ramsay.—I think our system of civil administration came out very well during the recent pressure. It must be remembered, however, that in this district the distress, though severe, never amounted to actual famine. My present relations with the Public Works Department in both branches are most harmonious, and have always been so. There are 12 *talukas* each, with a mamlutdar (tahasildar) at its head, who is a second-class magistrate. There are four assistant collectors, one railway magistrate, and a Huzur deputy collector at head-quarters. This staff has been found ample. The subordinate judges aided materially in organising private charity. All did their duty according to their abilities. The relief works consisted of roads constructed under the executive engineer. But all plans were sanctioned and funds provided by the collector, executive details being left to the engineer. The whole, of course, was under Government supervision. Not having been in the district at the time, I cannot give further details. Just now there are some three storage tanks being constructed by the irrigation department. But I have no control whatever over these works beyond controlling the supply of labourers and seeing after their comfort and so forth.

Madras.

MADRAS.

Sir W. R. Robinson.—The civil administration of every district needs that liberal strengthening and expansion on the occurrence of a famine which has to be allowed, for the ordinary peace establishment of the country will not bear the strain of the campaign. The occurrence of a very severe famine once in a generation is no reason for extensive change in the civil administration of the country, which is fairly adapted to the occurrences—famine included— of the time. Some of our districts will however be better of sub-division for general improved administration. The point, however, to which the attention of the Commission must I think be directed is the constitution of this accession of strength, and here I am satisfied that the policy which has characterised the management of the South Indian Famine of 1877–78 requires very careful examination before it is accepted as a precedent for the future.

I hold * that municipal commissioners and local fund boards — more especially in respect to their native element—should be largely consulted in respect to relief operations of all kinds—selection of works, &c., &c., within the range of their responsibilities; and should be entrusted with much of the administration of gratuitous relief under careful supervision. In this respect the administration of the late famine has been reprehensibly defective in my judgment. I am aware that instances of misfeasance and neglect can be heaped up against the lower native agency to whom the detail of administration has after all to be left; but this want of integrity lies mainly, I believe, in the fact that an alien superior bureau is necessarily thrown for its aid in administration on the lower orders of the people, who naturally show more wit than moral tone under such supervision. But I am not prepared to abandon hope that native agency, well managed, would on the whole come well up to the mark of what the management of their poor requires in this country. My belief is that centralised alien bureaucratic administration of famine is never likely to be more successful in saving life, &c., in India than a similar direction of poor law administration would prove in England.

The district covenanted administration must be so strengthened as to enable its head and superior divisional officer really to direct the administration without becoming personally managers of camps, &c., and practically famine relief officers, or being obliged to "let things slide" as occurred in Bellary, and for a time elsewhere.

As already noticed I do not consider the relations between the civil administration of a district and the Department of Public Works well adjusted under the circumstances that have existed up to this time; and the famine disclosed much weakness and want of rapport. I fail to see how the recent reorganisation will mend matters traversing as it does more largely than has obtained for some years a district administration in this department.

Mr. Longley.—The events of the last famine have shown that it would be advisable to divide the area now allotted to the supervision of one collector.

Eight thousand (8,000) square miles is too large an extent for one man properly to supervise, and in times of *pressure*, like the famine, the strain was too great. With the district divided into two you will have a *responsible* man with an effective establishment in charge of a manageable area, which I do not consider the present extent to be.

I am very strongly of opinion (*vide* answers to Section I.) that in all matters of labor, relief administration, *e.g.*, the selection of persons for relief-works, the hutting and general arrangement of labor-camps, the transferring of coolies from one work to the other, the arrangement and carrying out of tests, and the system of paying the coolies, the Public Works officers, from the district engineer downwards, should be completely subordinate to the collector. Had this been the case during the late famine, I consider the relations between the Public Works Department and the Revenue officers would have been more harmonious. On all professional points I would, of course, not allow any interference from the Revenue officer. The relations between the Public Works officers and the Revenue officers in Salem have not been harmonious, the engineers, as a rule, looking upon their department as entirely a separate one, and not part of the district machinery of which the collector should be the sole controlling power. There is too much tendency in this department to the "*imperium in imperio.*"

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* See my minute of inspection of Salem, dated May 1877, for observations on neglect to utilize even the local fund dispensaries during the late famine.

As regards the staff of civil officers in Salem, there are at present—

(1.) Covenanted sub-collector and joint magistrate in original revenue and magisterial charge of three taluks.
(2.) One covenanted head assistant collector and magistrate in original revenue and magisterial charge of two taluks.
(3.) One uncovenanted (native) deputy collector and magistrate in original revenue and magisterial charge of two taluks.
(4.) One European covenanted assistant collector.
(5.) One native covenanted assistant collector (removed).
(6.) One uncovenanted European assistant in charge of the Huzur treasury.

I cannot suggest any improvement in the staff or organisation of my divisional officers.

The native subordinates have, as a rule, been capable and energetic and physically active in carrying out relief measures. Among the village officers (munsifs) it has been observed that *caste* prejudices have occasionally interfered with the exhibition of humanity, *e.g.*, a Brahmin munsif hesitating or neglecting to relieve a starving pariah because he was a pariah. This however was quite the exception.

The Salem district has an area of 8,000 square miles with a population of close upon two millions. The Oosoor taluk is on the Mysore plateau, and the other taluks slope down from this to the level of the plains below; Oosoor, Dharmapuri, and Krishnagiri lie high and dry, and these with Utankarai, Trichengode, portions of Salem and Namkal taluks were the most famine-stricken parts of the district. In these taluks there was no dry cultivation whatever, and the crops raised under wells scanty.

Relief-works under the direction of the collector and his subordinates assisted by the Public Works staff and local fund staff of the district were commenced in October 1876, and up to September 1877 (when all labor relief was handed over entirely to the professional agency) the following works were carried out:—Upwards of 1,000 public wells and drinking ponds were deepened and improved, 650 tanks were put into thorough repair, 230 miles of new road constructed, 80 cart-tracks leading to villages opened out and widened, and 1,300 miscellaneous improvements effected in villages. These works employed 2¼ per cent. of the population at a cost of ten lakhs from October 1876 to September 1877. The works under Revenue agency having come to an end, it became necessary to devise some large works to be carried out by the Public Works Department, when the following large irrigation works (which, *if completed, will be of* permanent benefit to the country) were put in hand between September 1877 and the close of the year:—

Marandahalli - - -	Dharampuri.
Baroor Pennagoondapuram	Krishnagiri.
Veniar - - - - -	Utankarai.

For the southern taluks work on the Imperial lines of road was provided; and for the weakly on civil agency works breaking and stacking metal was continued.

My control as head of the district extended over the whole district, and I was perfectly independent in carrying out famine operations which had received the sanction of the Board of Revenue and Government. Each divisional officer was held responsible for carrying out the orders received from me as head in their entirety, and the tahsildars were in the same manner held responsible to their divisional officers.

Mr. Price.—In Cuddapah the system of civil administration *most* certainly was not strong enough to bear the strain brought upon it, and I believe that this was the case everywhere. European officers worked with a will, and it was not for want of exertion on their part that things went wrong. The chief defects were the immense areas, and the multifarious duties which the collector and divisional officers had to perform. The Cuddapah District is over 8,000 square miles in extent; about half of this is under the sub collector. The permanent Revenue staff is one collector and district magistrate, one sub collector and joint magistrate, one head assistant collector and magistrate, one assistant collector and magistrate, one general charge deputy collector, one treasury deputy collector. Each of the eleven taluks into which the district is divided is under a tahsildar who is, or ought to be, a kind of minor collector, and who is further a third or second class magistrate, and there is a sheristadar in each taluk who is really a superior head accountant, with third-class magistrate powers, but who, under existing orders, should do as little criminal work as possible.

This was the staff which was in the district when the famine fell upon it; there was however no assistant collector, his place being filled by a native temporary deputy collector. The first defect found was that when the collector or a divisional officer was away at the point A trying to put things right, something at the point B, some fifty or sixty miles off, would turn up, calling for his immediate presence. He would hardly get to B, when something would occur at C, and he would have to start off for that place forthwith. There was never time to put things into order. As for giving any, but one or two tahsildars, instructions, and relying upon their carrying them out, it was out of the question. The next defect was that crime increased and filled the jails and police lock-ups. It was impossible for the magistrates to, in their revenue capacity, look after the famine, scamper over the country, and try prisoners too. The next defect was that there was no sufficient staff to look after or organise works. Reports and returns had to be sent in and the work of the district carried on somehow. Works consequently had to pass a good deal into the hands of underlings, and suffered accordingly.

The next defect was that when it was considered necessary, in order to relieve officers, to appoint special native magistrates, &c., we had, as a rule, nothing but a very inferior class of men to put in. The remedy for all the defects mentioned, excepting the last, is to strengthen establishments. Those which we now have are spread over enormous areas and are barely sufficient to work the districts in times of prosperity. The moment any pressure comes they must fail. I would suggest, as an improvement, that every collector should have a deputy collector and first-class magistrate as his personal assistant (the treasury deputy collector is said to be this, but he is not; he is merely the accountant-general of the district), and that this officer should not be moved about in the way in which they, for some years past, have been. I would give the sub collector an assistant, or deputy collector, to help him. I would increase the number of deputy tahsildars and so decrease the work of the tahsildars. The number of statements, returns, and reports called for now-a-days is far more numerous than it used to be even when I first entered the service, and officers, from the collector downwards, are from sheer necessity degenerating into desk-men. As regards the last defect alluded to, I would propose improving matters by giving better pay and turning out of the service men who are really perfectly useless. The grades through which men ought to work up to a deputy collectorate are, first, Revenue inspector (which is higher than that of any one on the taluk establishment of lower rank than the taluk sheristadar, and which is supposed and ought to give very considerable revenue experience); second, taluk sheristadar; third, deputy tahsildar; fourth, tahsildar. But the pay of the Revenue inspectors is too low. The three grades are paid Rupees 30, 25, and 20. The last-named salary is that of the first two gumastahs of a taluk Cutcherry. The consequence is that, as the life is rough and involves much moving about, for which no travelling allowance is given, the post, instead of being coveted, is anything but. A good man in

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the Huzur knows that he has a better chance of getting better pay if he remains where he is, and he remains on if he can, even at the sacrifice of pay, and an incapable, or some man whom his native or European superior wishes to get out of the office, becomes very frequently a Revenue inspector. I would increase the pay of the Revenue inspectors to Rupees 30 ,40 and 50, and make them pass, for first class, the Revenue test, lower grade, and, before being qualified for promotion to taluk sheristadar (on Rupees 60), pass the test criminal, lower grade. Where men were certain that getting into this class of what ought to be very useful public servants would, with common industry and honesty, lead to advancement, we should, I feel assured, get a better style of subordinates, and on an emergency have men upon whom we could depend, instead, as was, as a rule, the case, of a parcel of effete old men. Had there been efficient subordinates available during the famine, a host of blunders and losses and quires of paper would have been saved. The only district in which I have been, which is small enough for one man to supervise, is this (Chingleput), which is the smallest, excepting the Nilgiris, in the presidency. It is some 2,600 square miles in extent, which is somewhat less than one-third of the area of my last district (Cuddapah) and less than one-fourth of the area of that in which I was before (Bellary). I have not been in this district long enough to be able to form an opinion as to the official relations between the Public Works Department and civil departments. They vary in every district in which I have been, but they are generally not of a cordial character. In Cuddapah I certainly did not, for a long while and until the matter was prominently brought to the notice of Government, have any help from the Public Works Department head of the district. He would neither take over works himself (this was before September 1877), nor would he, advise, inspect, or make his officers inspect, those which we had in hand. As matters now stand we are perfectly powerless. We can ask for advice, plans and estimates, and that is all. I do not think that, as a rule, the officers of the Public Works Department care to talk over matters with the civil officers. This is natural enough as they are professional and we are not. I certainly would not care to be troubled with the views of an engineer on Revenue matters.

The staff of this district is as follows:—

Collector and magistrate.
Sub collector and joint magistrate.
Assistant collector and magistrate.
General charge deputy collector and magistrate.
Treasury deputy collector.
Collector's sheristadar.
Six tahsildars, six taluk sheristadars, six deputy tahsildars, including one town magistrate for Conjeveram, and a staff consisting of clerks at head-quarters in the sub and general deputy collectors' offices, three Revenue inspectors and nine gumastahs in each taluk, and two in each deputy tahsildar's office.

The sub collector has revenue and magisterial charge, both original and appellate, of three taluks. He has to try all first-class magistrate's cases occurring in these, to supervise the working of his tahsildars, to dispose of appeals from their orders, and of their reports to him. He has, besides this, to perform the business devolving upon the vice-president of the local fund circle of Chingleput. He has once a year to make the annual settlement of at least two taluks. The general deputy collector has the same powers and duties in the two taluks of which he is in charge as the sub collector has in his. He has however no local fund work.

The assistant collector if passed, which he most frequently is not, has generally the immediate charge of the collector's taluk, signs letters, does miscellaneous work for the collector, and takes magisterial work and suits under Act VIII. of 1865.

The treasury deputy collector is mainly in charge of the treasury and accounts, and he ought properly to do nothing else. He is supposed to be in charge of the press and English records, to prepare drafts of reports of various kinds, and to supervise the whole of the English and account branches of the office, but he rarely does this. Here I found the press so badly managed, and the accounts so much delayed that I took it from the deputy collector and made it over to the assistant.

The collector's sheristadar is the head of the vernacular department, drafts letters and reports on matters more difficult than those of ordinary routine, and orders on vernacular papers which may be referred to him, manages abkari correspondence, has statements for the board prepared, and is really much more the collector's personal assistant than is the treasury deputy collector. He has, at the annual settlement, to go over all the accounts and make the necessary preparations for the settlement, to read all papers brought for disposal at that time, and to lay them before the collector for orders.

He has also to examine all periodical statements regarding the collection of revenue, &c., sent in by tahsildars and divisional officers. The tahsildars have to supervise the collection of land revenue, to dispose of applications for lands for cultivation, to move about and examine cultivation, dispose of reports from village officers and Revenue inspectors, try magisterial cases, which are generally very numerous, reply to references from, and supply information to, their superiors, and to perform a mass of miscellaneous work which it is impossible to enumerate. A tahsildar who does his business conscientiously has enough to keep him going from morning until night, and then he cannot, unless he is a very good workman, get through all that he has to do. The taluk sheristadar's business is mainly to look to the accounts and prepare the periodical returns. He assists the tahsildar in magisterial work of a simple nature, and, where he does his duty, he has quite enough to perform.

The deputy tahsildars have, in a minor degree, the same work as a tahsildar, but they have no treasuries, and their responsibilities are not so great; they have a good deal of magisterial work. The Revenue inspectors are supposed to be constantly on the move, to check and examine the cultivation in the villages in their respective ranges, to check the curnam's accounts and inspect shavi (withered crop), see that the collections are regularly and properly made, bring to the notice of the tahsildar any matter appearing to call for attention, conduct sales for arrears of rent and revenue, report upon such cases as are referred to them by the tahsildars, and to do much miscellaneous work. They have no original authority and can themselves decide no case. If the pay and the class of men were improved they might have power in petty matters and decide others of moderate importance, subject to appeal to the tahsildar, who, with this authority, would be acquiring experience of a duty which he would be called upon to perform when a deputy collector. I think that if the assistant collector was not always being changed (I have had three since March), the present superior staff is, as regards Chingleput, sufficient. The organisation appears to me to be good enough. I could not suggest a better, but I would increase the number of Revenue inspectors from three per taluk to four (Conjeveram alone has that number), and to get a better style of man, I would increase the pay of the head gumastah of each taluk from 20 rupees to 30. He has very many responsibilities and is hard worked. The strength of the taluk establishment is not sufficient to carry on work rapidly. There ought to be another man in each office. As a class I do not think that the native subordinates came out well during the famine. There were, of course, some honorable exceptions of men who worked in a very satisfactory way, but they were few in number, and were under European officers. The remainder required constant driving, and in some cases, showed the utmost indifference for the sufferings of those around them, and utter disregard for the responsibilities of their position. My deliberate opinion, after experiment, is that no native can be trusted in a position of command during a famine. They want, if honest, decision, firmness, and energy; they in adverse circumstances lose heart and head, and, if dishonest, their sole idea is to make money out of the event. As subordinates, and where they have had good men to lead, some natives who were under me did right well, but as I have said they were few; I could count them on my fingers.

The mode in which relief operations were conducted in the Cuddapah district was as follows:—There are eleven taluks. Of these, four were under the sub collector, two under the head assistant, one under the special assistant collector, one under a special deputy collector, who was an European deputy director of revenue settlement, two under a special civilian from Bengal, who, for part of the time, held the remaining taluk which was, however, on my getting a fuller staff, placed under another special officer. For a portion of the time one taluk was under one native deputy collector, and two were under another, but matters went on so badly that I had to put their charges under European officers as soon as I got them, and give the natives magisterial and revenue work alone.

Each of the officers specified was a divisional officer and was in direct communication with me. He was, until the Department of Public Works took over the works, in charge of them and of gratuitous relief of all kinds. He was directed in his operations by general orders from me, and these he had to carry out. With matters of petty detail I did not interfere.

I myself took no immediate charge, but moved constantly about, inspecting and consulting and putting right, as far as I could, what was or seemed to me wrong. I invited suggestions from my subordinates, and, where these appeared to be good, acted upon them.

The schemes for village relief, poor-houses and works were all on one plan, and the instructions regarding them were issued by me. I allowed officers, on reference to me, to make modifications where local or other circumstances rendered it advisable, but not without first obtaining my consent. I did not allow any work, except of a petty nature, to be taken up without first consulting me.

I interfered with no officer's movements and left him as much as possible to go where he thought that he was the most needed, and where he could make any arrangement with the Department of Public Works officers to carry on or overlook relief-works in his charge, I allowed it to be done without reference. I did not have anything to do with any minor appointments; I merely required my sanction for the appointment of superintendents on works.

The tahsildars assisted the divisional officers, who had subsequently the special relief officers under their orders to inspect, check accounts, pay on the works, &c. Each divisional officer was responsible for the accounts of his division, and was supposed to send them in every week to headquarters, but notwithstanding constant pushing many delayed very much. The chain of responsibility was maintained by divisional officers being in constant correspondence with those under them by frequent inspection, weekly statements and monthly reports, and by the initiation of any important change or measure without previous sanction being forbidden. My orders were, however, that every officer must in an emergency act at once as he thought best and report afterwards.

I was at first controlled a good deal in matters of detail, but afterwards I was able to do very much what I thought best, there being general principles laid down for my guidance. I had to make constant reports to the board and afterwards to Government; where I thought it necessary I acted at once and reported what I had done, and when I wished to make any considerable change I wrote and obtained orders. I might reduce or add to numbers, move one officer from one part of the district to another, put him on what duty I thought fit, order any particular form of accounts, statements, or returns other than those required by the board or Government, close a work, and so on; but I could not alter scales of wages, direct a work costing more than 2,000 rupees, or without an estimate to be taken in hand, alter certain forms of relief, order tools and plant, &c., without permission. I might dismiss, without reference, any famine officer, not permanently in the service of Government, but I could not appoint those of superior rank. I am bound to say that all through I had but little to complain of in regard to interference by higher authority; there were some points in connection with orders which I received in which I did not agree, but it was my duty to obey instructions and I did so, remonstrating where I thought I justly could.

Mr. Grose.—The civil administration of the district is not strong enough to bear the unusual strain of a famine. I had an additional sub collector and two additional assistant collectors at the beginning of the famine, and this was sufficient, except so far as works, which wanted professional supervision, were concerned, till the time came when the famine was at its worst, and then more European supervision was badly wanted, especially for gratuitous relief. We got it afterwards, but the Bengal famine officers did not come till the hardest strain had passed.

The area of the district of Nellore is large, 8,402 square miles. It is too large for a collector to be well acquainted with every part of it, but the sub-collector is almost a collector, and is intended to be so. Comparatively few things that go on in the sub-division come to the collector's notice, and I do not think it necessary they should. The work in ordinary times, though sufficient, is not oppressive.

The sub collector is the collector and magistrate of the zemindari divisions of Podile and Darsi, and the taluks of Ongole, Kundukur, and Kanigiri. Within this tract he exercises the same powers as a collector and district magistrate, but he is subject to the collector's general control, and has to refer to him all points not previously decided or connected with the appointment, dismissal, or punishment of the sub-division sheristadar or the tahsildars of his taluks. There is a head assistant collector who is also a 1st-class magistrate, and has the whole charge of three taluks, viz., Kavali, Udiagherri, and Atmakur, and magisterial charge of the portion of the Nellore taluk, north of the Pennar river. There is a deputy collector, who is also a 1st-class magistrate, and has the whole charge of the zemindari divisions of Polur and Vencatagherri and the taluk of Rapur, and magisterial charge of Gudur. The head assistant collector and the deputy collector are experienced officers, but are completely under the collector's control. There is an assistant collector who is a 3rd-class magistrate, and who assists the collector, but he cannot be put into direct charge of any portion of the district, or made of much use in any way until he passes certain examinations. Thus the collector has revenue charge of Nellore and Gudur, and the magisterial charge of the part of Nellore south of the river which includes the town. There is a treasury deputy collector who acts as a personal assistant to the collector, and conducts the transactions of the treasury. This staff is of sufficient strength for ordinary times, and the only improvement I can suggest is an exchange of divisions between the head assistant collector and the deputy collector.

My official relations with the Department of Public Works officers have been unexceptionally good.

Most of the higher native subordinates, such as tahsildars and deputy tahsildars, showed a fair amount of energy, capacity, humanity, and physical activity during the famine; but nearly all the underlings took tribute from the relief money which passed through their hands, and did nothing more in the struggle than they were distinctly told to do. The management of works and camps by native revenue officers was, however, seldom good. In the one case they were without

H. III. Qn. 40.

Madras.

professional knowledge; in the other they were wanting in habits of compelling cleanliness and discipline, and perhaps in the courage to act outside the law where that was necessary.

Every week reports were submitted to me from all tahsildars and deputy tahsildars regarding the state of the season and prices. From time to time reports came from divisional officers to the effect that relief-works or camps were wanted here or there. If the reasons for the works were good, I either sanctioned them or submitted them to higher authority, according to their probable cost. With regard to relief-camps, the want of administrative and medical supervision pressed at once, and I had to decide that, as a rule, there should be but one camp in a taluk, though in exceptional cases there might be two. The sites were then fixed by divisional officers in communication with me. I and each divisional officer received weekly reports from the village inspectors and passed the necessary orders thereon. When a work had been sanctioned, the divisional officer arranged how it should be carried out till the Department of Public Works took charge. Weekly reports came to me from all relief-works and relief-camps, and enabled me to secure uniformity. With regard to both works and camps rules were issued by me and by higher authority from time to time as to points in which uniformity was necessary, and so long as those rules were observed divisional officers were independent.

Similarly certain rules which will be found in orders of the board and Government were binding on me, but the discretion allowed was sufficient.

Mysore.

MYSORE.

Colonel Sankey.—I have sufficiently before adverted to most of the points here dealt with. As to the inquiry how far I was myself controlled in the relief administration I will frankly say that, while I was, as I believe, prejudicially controlled, and my motives and objects misapprehended, I have no desire to go back on any of these circumstances, further than as may be necessary for throwing light on the immediate object of the Commission's inquiry, and for helping Mysore, to which I owe so much, to bear its next famine trial better than it has done its last. This I believe it can do in the manner I have endeavoured to point out (see Section VII. of the *printed Collection*), if enlightened views prevail, but not, I should fear, otherwise.

Mr. Ricketts.—I consider the civil administration of my district strong enough to bear the unusual strain of famine, provided of course temporary additions be made to the existing machinery to meet temporary exigencies. My district is of very convenient size. My official relations with the officers of the Public Works Department are such as are most conducive to the carrying on of relief works. There was some difference of opinion at one time, and there is probably difference of opinion still, but principles being now laid down the official relations are harmonious and tend to beneficial results.

My native subordinates were sometimes wanting in energy, capacity, humanity, and physical activity in carrying out relief operations, but there were some notable exceptions.

By the end of October 1876, the famine hitherto disbelieved by many, had fairly set in, and relief works were commenced, and then followed the opening of kitchens; the former to provide able-bodied people with employment, and the latter to distribute food gratuitously to such as were sick or emaciated and were physically unable to work for their own support. In organizing the above works and kitchens special assistance was obtained from the judicial assistant commissioner, munsifs, and their establishments. The services of certain upper subordinates of the town and cantonment and district police were also utilized. Further, a number of officials of the district and Treasury Offices were also deputed to special famine duty, their places being filled up by temporary substitutes where absolutely necessary.

H. III. Qn. 41.

Question 41.—System of Correspondence and chain of Official Responsibility.

Through what channels have orders relating to famine relief reached you from the Government? If references were sent by you, and orders received by you from the Government or its representative in the Famine Department direct, state whether you think that course operated well, whether the necessary business was rapidly conducted with consistency and precision, and with due attention to the exigencies of special circumstances and localities, &c. Do you think this course best, or that the work would have been more effectually done had there been an official (whether Commissioner or Member of the Revenue Board, or by whatever name called) who should have been in administrative charge of a group of districts, and would thus have become acquainted with their wants and circumstances by personal inspection? If, on the other hand, you received the orders of the head of the Government through any intermediate authority, state if, in your opinion, there were any disadvantages attaching to this course, such as weakening the sense of personal responsibility in the local executive officers, delay in replying to references, or want of uniformity of method in different parts of the province, and so forth.

Punjab and North-Western Provinces.—Government corresponded with collectors through the commissioners except in emergent matters.

Bengal.—Special Famine Commissioner not approved. Government should communicate in emergent matters direct with the collectors.

Bombay.—Orders were communicated to collectors direct by the Secretary to Government, P. W. D. (Sir M. Kennedy). This plan is generally approved.

Madras.—Thirteen gentlemen (Europeans) have replied.

The evidence is entirely in favour of the control of famine relief operations being vested in one central authority issuing its orders direct to the local officers and not through the Revenue Board.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—Occasionally direct from Government, and most frequently through the commissioner of the division. No references were sent by me direct to Government and its representatives in the Famine Department. Except in cases of emergency all orders should be sent through the commissioner of the division, a course which has not by any means weakened the sense of my personal responsibility or caused any unnecessary delay in replying to references.

Mr. Gardner.—Formerly the magistrate and collector was on many matters in constant and direct communication with the Secretary to Government, though usually in a demi-official form.

This practice, however, has of late years been disused, and all communication between district officers and Government discontinued except through the commissioner. On most subjects connected with famine, and all subjects connected with relief work, the commissioner does not correspond directly with the collector, but communicates to the collector through the secretary to the commissioner, who is the executive engineer, and the collector must address in reply the same officer, and not the commissioner direct. I consider the result of this circumlocution to be detrimental in many ways.

BENGAL.

Bengal.

Mr. Kirkwood.—I would, in famine matters, have the organisation of the official staff up to the collector regulated in the manner already stated in answer to questions 31, 40, and elsewhere. Government orders should be communicated to the divisional commissioner and, through him, to the collector. The collector, should correspond with and report to the commissioner, and the commissioner should correspond with and report to the Government. The commissioner should be responsible for the division, the collector and his relief officer for the district, and the local Government for the province or presidency. Where there is a divisional commissioner I would have no appointment such as a famine commissioner to a division. Such an appointment was made to the Patna and Rajshahaye divisions in 1874, and, judging from all I have heard, it did not work well. The position is anomalous: the commissioner of the division must be still really responsible for his division, and yet the famine commissioner would be almost independent of him, and would correspond direct with Government. I would prefer giving the commissioner a personal assistant, of the standing of a junior collector, to whom he might entrust as much or as little of famine work or of the ordinary work as he may desire, the commissioner being solely responsible. Such a personal assistant would correspond with district collectors only in the commissioner's name, and in all matters of important orders, or the award of praise or blame, under the commissioner's own signature.

Where (as in Madras) there are no divisional commissioners I think there should be famine commissioners temporarily employed, each of whom should superintend the famine operations in three or four districts, and be the channel between the Government and the district collectors. These famine commissioners might generally be appropriately selected from the senior collectors.

The remarks I have above noted are drawn mostly from what was done in Bhagulpore (1874).

Those arrangements seemed to work well.

Urgent references should, whenever expedition is a main consideration, be often addressed direct by Government to the district collector or the district chief relief officer, who would then reply direct to Government, sending at the same time copies of the correspondence to his immediate superior for information.

BOMBAY.

Bombay.

General Wilkins.—All the orders of Government were received from the Secretary to Government in the Public Works Department, Major-General (now Sir Michael) Kennedy, under whose direction all the business connected with the famine was conducted. I consider that the course adopted not only answered well, but was the very best which could have been devised. General Kennedy's acquaintance with the country, and his connection as head of the Public Works Department with the projection of works required to be inaugurated for the purpose of giving relief, enabled him to form his own opinion without consultation or correspondence on every project which was submitted to Government. Hence there was no delay in the due transaction of business, saving what occurred in the transit of the post and the brief time General Kennedy required for the record of his opinion and orders in each case.

Every order of Government relating to the famine generally, and to the districts of the southern division in particular, came direct from General Kennedy's office to me for promulgation to the seven executive engineers of the division. The sanctions and orders, with or without subsidiary instructions as occasion required, were disposed of by me daily as they arrived.

To the question put in the 41st paragraph relating to this subject, I unhesitatingly assert that the administrative work would not have been so well performed by a special commissioner placed in charge of several districts.

Mr. Spry.—Government resolutions and orders relating to famine have reached me direct from Government through the Secretary, Home Department. Ordinarily speaking, references sent by me would go through the commissioner of the division; but during the famine, in all emergent matters which would not admit of delay, I sent references direct to the Secretary to Government, only sending a copy to the commissioner for information. The commissioner having his head-quarters at Belgaum, it would have caused great delays had I always communicated with him direct. By communicating direct with the Secretary to Government, business was rapidly conducted with consistency and precision. The Secretary to Government invariably replied at once, so that by direct communication I often got orders almost before, under the ordinary routine, the communication could have left the commissioner's office.

In matters which did not require prompt settlement, I always referred through the commissioner.

Mr. Moore.—Through the commissioner and direct, a copy of the latter order being sent to the commissioner. I think that the system carried out during the famine was the best, viz., of all general orders being issued direct by the representatives of Government in the Famine Department. All the orders were clear and precise, and this seems far better than if orders had been issued by different officers in charge of different groups of districts. The system adopted in this presidency worked admirably.

H. III. Qn. 41.

MADRAS.

Madras.

Sir W. R. Robinson.—I have no doubt whatever that the defect noticed in third query of this question, viz., the absence of a responsible and well adjusted civil itinerating inspectorate—for two or three districts—throughout our famine area caused much drift and administrative shortcoming during the whole period of our distress.

An effective civil inspectorate should in future be constituted and maintained throughout the campaign; and alongside it a sanitary inspectorate over perhaps wider ranges. The latter was organised about May 1877 and proved most useful for many months. It was perhaps too soon given up towards the end of the year.

I myself greatly prefer the guidance of a consultative body in the general management of grave exigencies, and the deputation of members of such bodies when local inspection or direction are needed. So far as possible members of the Board of Revenue are the proper advisers, inspectors, &c., of local administration; and by adding a member or two to the board, two or three members may always be on tour or on such urgent duty as properly fell to them during the late exigency, until laid aside in September 1877. No future famine administration should be attempted without a well constituted superior civil inspectorate.

Mr. Longley.—Up to September 1877 the orders reached me through the Board of Revenue. After the Famine Dictatorship was established I received them direct from Government. I consider that in an emergency like the famine of 1877-78 the latter is the more preferable course. The communication being direct, business is conducted, so far as my experience goes, with far more despatch than when filtered through an intermediate channel. I am averse to having any officer between the head of a district and Government. The head of a district should communicate direct with the *Government*, and be personally responsible to the Government alone.

Mr. McC. Webster.—I think the arrangement by which district officers corresponded direct with Government in the Famine Department and received orders direct operated well, and it could not, I think, have been improved upon.

Mr. Price.—First, through the Board of Revenue; second, through the additional secretary to Government in the Famine Department.

I consider that the second named of these courses was decidedly the better. There was practically but litle, if any, use in orders going through the board, or in references being made through them. The board had frequently to write nothing more than "submitted for the sanction of Government," "submitted for the orders of Government," "the collector's proposals are approved." There were of course cases in which local knowledge, possessed or obtained by the Board of Revenue, helped to elucidate remarks of collectors, but these were very few in number, and I found corresponding directly a decided improvement. Replies were more quickly received and business, generally speaking, more raipdly and satisfactorily disposed of than under the plan which held in the earlier stage of the famine. I do not, from what I have seen, think that a commissioner over a group of districts would have been of any practical use. He could not, unless well acquainted with them before, have seen, though he travelled night and day, very much of what was going on, and he would not only have restored the disadvantage of correspondence which could easily be disposed of at once, having to pass by a round-abou course to Government, but would have probably tormented collectors with his own hobbies on the subject of famine management which might not be in accordance with the views of Government and would in that case have been set aside as soon as they reached that authority, thus giving extra work. My experience is that the fewer masters one has the easier it is to do work of all kinds. I do not think that during the period that correspondence went through the board there was any breaking of the sense of responsibility created thereby; there was delay in replying to references, but this was unavoidable. As regards want of uniformity of management I can say nothing.

Mr. J. G. Horsfall.—*Clause* 3.—I prefer direct communication with Government through the famine secretary, but would leave it to Government to appoint special commissioners to visit famine districts, to see that their orders are understood and obeyed. A commissioner in charge of several districts would entail but little less delay than the Board of Revenue did.

Clause 4.—When references were made through the Board of Revenue there was necessarily great delay.

Mr. Grose.—I received orders at first through the Board of Revenue, and afterwards direct from the Governor; but I cannot say that the transactions in this district were affected by the change, either for good or evil. My own opinion is in favor of a board as against commissioners if we cannot have both.

Mr. Oldham.—Before October 1877 the time ordinarily taken in obtaining an answer to a reference from Government by a divisional officer was two months. As a result, up to that date, subject to the general orders my action in relief administration was altogether uncontrolled and discretionary. I believe direct correspondence with Government by district officers to be the best course for famine administration.

Captain A. Awdry, R.E.—The ordinary channel through which famine orders have reached me has been through the Public Works Department; this I think was needless and wasted time. During famine all papers relating to famine should, I think, go direct to, and be received back directly from, the Famine Department without the intervention of the secretariat, with which the officer usually corresponds. I frequently—in fact generally—find that the Revenue officers have their orders from Government some days before I get mine, because mine have to be reprinted and issued from the Public Works Secretariat, while the Famine Department is a part of the Revenue Secretariat.

MYSORE.

Mysore.

Colonel Sankey.—As Chief Engineer and Secretary, my orders came direct and personally from the Chief Commissioner; and where both officers have been carefully selected for their respective posts, I can conceive no better arrangement. I have already ventured at some length to show that the appointment of an officer as Famine Commissioner for a Province, or analogous appointments for Divisions, are not desirable. Great strengthening of all lower grades, and particularly in the Public Works Establishment, would be essential, as also extra Session Judges, Magistrates, Police, Relief Officers, &c. The routine of administration generally should not, I think, be in any way changed.

Mr. Ricketts.—Up to September 1877, I received orders relating to famine through the ordinary channels. The intermediate authority was in fact the commissioner of the division, and the consequences, among others, were very grave delays and want of regard to special famine exigencies. There is no

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Mysore.

doubt but that at famine time a special famine department is required whose sole time and energies should be engaged on the campaign; then matters are settled with rapidity, consistency, and precision, and the district officer takes heart. In fact all take heart, and real, active, and beneficial work is the result.

Question 42.—Financial Control and the Audit of Expenditure.

Ch.III. Qn.4

Under what financial control were the operations placed as to the supply of funds and authority to spend money or sanction and commence works? State generally the system adopted, and what you think of it? Mention if any irregularities or frauds took place in the application of money, or were supposed to have taken place, and how and to what extent? Is it anywhere currently reported that any persons of any class engaged in the relief operations have become subsequently enriched, or is there reason to think that peculation or malversation were rare and exceptional? Were sufficient means available for checking the expenditure and rendering and auditing the accounts? How was this part of the operations conducted, and with what general results; has the whole of the outlay been satisfactorily accounted for or not, and if not, what deficiencies have arisen and in what manner, and how have they been dealt with?

Punjab and North-Western Provinces.—The district engineers disbursed funds and accounts for them under the rules of the P. W. D., which audited the expenditure.

Bengal.—In Behar the expenditure and accounts were in the hands of the district officers, and there was some confusion; but the peculation is not held to have been large.

Bombay.—Financial control was exercised through the ordinary agency of the P. W. D. of Government.

Madras.—Seventeen gentlemen (Europeans) have replied.

The statement of Mr. Longley explains briefly the system of financial control adopted in regard to the expenditure of relief funds, and the instructions regarding relief operations issued by the Board of Revenue with their proceedings, dated 18th December 1876, No. 3208, treat of the same subject. The evidence shows that although there were many instances of peculation and petty embezzlements, which are almost inevitable in operations conducted on so large a scale, there were none of extensive frauds.

NORTH-WESTERN PROVINCES.

North-Western Provinces

Mr. Sandys.—The district engineer was furnished with funds by the accountant-general's credit orders. All disbursements were made by the district engineer or under his orders, and accounted for under the rules of the Public Works Department. As far as I am aware no irregularities or frauds have taken place, neither have any of the persons engaged in the relief operations become enriched.

The means available for checking the expenditure and rendering the accounts have been explained in answer to questions 7 and 8 of section 1 of chapter III.

The accounts have been audited under the regular rules of Public Works Department. The total expenditure that has occurred on relief works up to date has been Rs. 82,486, of which Rs. 71,166 has been audited and accounts have been rendered by the assistant engineers for the balance.

Mr. Atkinson.—(*a.*) Same as the ordinary course, through examiner, public works accounts.

(*d.*) The elementary public works forms, in my opinion, failed entirely in the Bengal famine, and led to great peculation. A new form was prescribed there, in which it was intended that a certain party should count the labourers or measure the task-work, another should present this statement to cashier, and a third (the cashier) should pay the amount. It was intended that the interest would be thus divided and a good check enforced; whereas it occurred, as I pointed out to superintending engineer and examiner, that frequently all three parties were combined in one individual, and he gave the orders on himself and paid himself whatever his ideas of honesty or dishonesty thought proper. The system of daily report, day-book, and imprest account for recording transaction of money failed entirely, as far as my experience went. In ordinary times and work, as I have always maintained, these forms are most inadequate for the purpose for which intended, and during pressure and famine nothing more unsuitable can be imagined. All subordinates had imprest accounts, and it was matter of frequent occurrence to find simply item after item written thus:—

6th -	- D. L. -	- Rs.	1,092	4	0
7th -	- D. L. -	- „	868	10	0
	&c.		&c.		

for which there was not the smallest check or guarantee of accuracy. The public works forms of accounts, as prepared in executive engineer's office and posted by examiner, are probably the most complete and appropriate that can be invented, but the whole of this depends on the initial forms, and nothing more fictitious and devoid of check and accuracy than the daily report and day-book can be imagined. For numbers of men, details of expenditure, quantities of work, there is no check, no proof that the figures are correct; yet on this a finished abstract is made in the end, but based on fiction entirely. There is no proof that the outlay was actually made, or if made, that it can be represented by a corresponding amount of work accurately measured by a responsible party.

BENGAL.

Bengal.

Mr. Worsley.—As district officer I exercised unlimited power in spending money and opening relief works. Petty frauds at the works, no doubt, took place. I have not heard of any class engaged in the relief operations having become subsequently enriched. Sufficient means were not available for checking the expenditure and rendering and auditing the accounts. Rough checking of expenditure and accounts was all that was possible under the circumstances. The outlay generally was satisfactorily accounted for on paper, and a fair amount of work was extracted from the labourers.

Mr. Hodgkinson.—I am unable to state definitely with whom the financial responsibility rested for the supply of funds for famine relief in Sárun during

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BENGAL.

1874-75. The collector had only to ask for the money, giving his reasons, and he got it. Advances were made for land improvements or for the purchase of grain to almost every applicant whose security appeared sufficient. A very large portion of these advances was not spent on the purpose for which they were obtained, but what portion was was never, I believe, ascertained. In 1874 I was informed of one case by Mr. Wright, the subdivisional officer of Sewan, in which a man who had taken some Rs. 300 or Rs. 400 advances nominally for wells had, undoubtedly, really borrowed it for a wedding, in which the whole of it was spent. Most of these advances have been recovered, but the loss of interest to Government and the trouble and expense of recovery have been considerable. There can be no doubt that peculation went on to a very considerable extent. Gold mohurs usually procurable in the bazaar for about Rs. 15 were at one time with difficulty obtained for Rs. 17 or Rs. 17-8; and the popular reason given for this extraordinary rise in their value was that remittances in hoards of gold mohurs were particularly affected by the dishonest mohurirs on relief works and storehouses. It is not in the accounts that the peculations are discoverable, though there are many points which have not been probably now, or never will be, cleared up; many are evidently errors from carelessness and inadvertence, which can never be entirely absent when work has to be done at high pressure, and sometimes by not very competent men. But advantage has, in some cases, been taken of these mistakes and peculations committed, though strict proof of them can hardly now be given. Money was mostly made by subordinate officers in relief works, over whom, working on the daily-wage system, proper supervision was impossible. There have been prosecutions arising out of peculations during the relief operations.

Mr. Finucane.—It is currently reported that mohurirs, contractors, and others became enriched during the relief operations in Behar. The best way to check such malversations is, I think, to have a large and trustworthy, though expensive, establishment organised, and on the spot, at the earliest stage of famine.

Mr. Magrath.—The financial control as to the money actually disbursed was practically in my hands. Government, of course, gave general sanction to my action, but any system of reference for petty sums of money, such as exists in ordinary time, is impossible. My officers indented on me for money for which they accounted, giving me a running account of the heads under which it was spent. I was responsible that the money was properly spent, and no difficulty was experienced in making up my accounts to the satisfaction of Mr. Taylor of the Financial Department, who inspected my office and accounts. Some of the subordinate public-works officers were suspected of peculation, but nothing was ever proved against them, and this took place mostly after the system of paying by measurement was introduced, to which no possible check exists. A number of minor officials were caught cheating (when grain payments were introduced) and punished. I remember no one in my subdivision who had anything to do with cash who enriched himself at Government expense. The expenditure on all works under them was checked by the circle officers. The accounts were made up after I got my account staff at head-quarters, and audited by a competent financial officer at Durbhunga. Every day the subordinates in charge of special works reported the number of men, women, and children; and if any returns were suspicious, the circle officer, or one of his assistants, checked the numbers. When measurement came in, difficulties were enormously increased, as measurement is such a lengthy process. Grain payments, as I have said, are peculiarly susceptible of peculation, and several men were caught who had made away with a large quantity of grain. On the whole, however, peculation was marvellously small, and I believe most of the guilty were caught and imprisoned.

BOMBAY.

BOMBAY.

General Wilkins.—The financial control of the famine relief works was that in force in the Public Works Department in ordinary times. All sanctions for the expenditure of money were accorded by Government. Works accounts were kept in the usual public works forms, and audit rested with the examiner of public works accounts.

Mr. Spry.—Plans and estimates for famine relief works were drawn up by the executive engineer, and then submitted by me for sanction through the commissioner Southern Division. The sanction of Government used to be given promptly, and then the works were commenced as necessity for them arose. It occasionally happened that the necessity arose before the sanction had arrived, and then I, on my own responsibility, would direct the commencement of a work, reporting that I had done so.

The system was the only one which could have been adopted, considering that no scheme for famine works had been thoroughly matured and prepared at a time anterior to the famine breaking out. Had such a scheme existed, our difficulties would have decreased materially.

Besides the above, Government gave me at different times on application grants, called discretionary grants, for expenditure on relief houses and on people not able to go on works. These grants amounted in the aggregate to three lacs of rupees. This money was disbursed to the assistant and deputy collectors in charge of talukas on requisitions made by them, and they were held responsible for the proper application of the money. This system worked well enough.

As regards relief works, I have not heard of any irregularities or frauds, except petty ones, having taken place. As regards the discretionary grant, so many people, such as circle inspectors, village patels, &c., had, of necessity, to be trusted with money that it was impossible to avoid a certain amount of petty pilfering, but there was so much supervision on the part of superior officers that there was but little chance of frauds on a large scale. In the cases of petty frauds which have been discovered, the delinquents have been criminally prosecuted. To show that the frauds could not have been of a serious nature, I may state that out of the three lacs of discretionary grant above alluded to I have accounted for the whole except Rs. 322. I have not heard any reports about persons of any class engaged in relief operations having become subsequently enriched, and I have shown above why I consider peculation exceptional.

Were I again to have the misfortune to be engaged in superintending relief operations, one of the first things I should do would be to very materially strengthen my head-quarters' account office, so as to admit of prompt checking of expenditure and auditing accounts. Not having had previous experience, I did not, I now think, strengthen it sufficiently. My taluka account offices were comparatively more strengthened than my head-quarters. I should, in fact, have an entirely separate Famine Account Department. The duty of winding up all the numerous accounts has not yet been concluded, but is being so gradually. Some of the accounts have been closed and satisfactorily settled, others only require time. No actual deficiencies which cannot be accounted for have yet come to light.

MADRAS.

Mr. Longley.—The general financial control was first vested in the Board of Revenue, and since September 1877 in Government alone. The appropriation of State funds to any particular object in connection with relief vested with the same authority, who had also the power to sanction funds for relief purposes in all its recognised forms. Within and up to the extent of the amounts so sanctioned the district authorities were authorised to make disbursements, except in respect of works in regard to which certain limitations were imposed, viz., that no work should be commenced without previous sanction by competent authority or properly-framed estimate, the collector being competent to sanction works up to Rupees 2,000, the Board of Revenue having the power to sanction works between Rupees 2,000 and Rupees 10,000, and Government all above this latter amount; and subsequently, after the management of relief operations was solely vested in Government, and when the numbers on relief declined, the power of the collector was reduced to Rupees 500, and eventually to Rupees 200; *all estimates above these amounts being* sanctioned by Government. In all cases where it was not possible to frame estimates owing to urgent need for relief, provisional sanctions were obtained for incurring outlay on works in anticipation of sanction to regular estimates. Periodical lump assignments of funds were obtained from the Board of Revenue (when they had the management of relief operations), and subsequently from Government; from these assignments grants were made to divisional officers, talukwar as required on indents submitted by them. Within these limits the divisional officers had authority to distribute relief in its various forms, and by the agency organised for the purpose each village head or each relief inspector was supplied with funds on his indents on the taluk. In the case of works carried out by the Department of Public Works funds were obtained on credits from the examiner of Public Works accounts, to whom the entire audit of expenditure on relief-works was entrusted.

Irregularities were frequent, and detection was not always possible. Under the system of supervision and check, as described in connection with Question No. 40, they could not have existed to a very large extent. The irregularities were committed in the shape of short payments, *i.e.*, payments at rates below the authorised ones, entries of payment to persons dead or absent, and on items of expenditure not actually incurred.

It cannot be said that any *particular class or classes* of persons engaged in the relief operations became enriched, but there is no doubt that many were better off for the famine, and there is not the slightest reason for supposing that petty peculations were exceptional.

Sufficient means, except in the early stages of the famine, has been available for checking expenditure and rendering and auditing accounts. The inspecting agency employed (*vide* Question 40) exercised a close check on the outlay, but in the earlier stages more superior* supervision was necessary to prevent irregularities being committed by the famine subordinates. A special establishment, consisting mostly of trained accountants, has been entertained to classify and audit the relief accounts and bills.

This important branch of work in connection with the famine relief has had its due share of attention and been conducted in a very satisfactory manner, but owing to magnitude of work and the unusual strain on the taluk staff, which was not strengthened to the proportionate degree to meet this extra demand, the audit could not be completed earlier, but there is every likelihood of the work being soon finished. Vouchers and accounts *are* available for a great portion of outlay; but, as the process of assortment and audit of accounts is still going on, it is premature to say what proportion of the expenditure will be left unaccounted for, but it is certain that it will not come to any appreciable amount.

Mr. J. G. Horsfall.—In this district relief-works were carried on under the Department of Public Works.

Clause 2.—Solitary instances of peculation with regard to village dole were reported, and in one instance a village munsif was convicted of such peculation to the extent of Rupees 50.

Clause 3.—It is not reported anywhere that any class of people engaged in relief operations became rich.

The few solitary instances of peculation brought to notice show that such must have been comparatively rare.

Clause 4.—Yes.

Clause 5.—As the relief-works were entirely under the supervision of the Department of Public Works in this district, the Revenue Department had nothing to do with the audit of expenditure on them. The audit of the gratuitous relief expenditure was conducted thus:—Advances were made to the tahsildars and deputy tahsildars, who distributed the money to village munsifs. The latter actually spent it and prepared vouchers as they paid. The vouchers were duly acquitted and sent to the tahsildar or deputy tahsildar, who submitted them to the divisional officer. The latter then examined them, and, if he found them correct, prepared and forwarded bills with the vouchers to the collector, with a certificate that all reasonable means were taken to check the expenditure. The bills and vouchers were again examined in the collector's office, and the former sent on with his countersignature through the Board of Revenue to the accountant-general's office, where they were finally adjusted to the proper heads and the expenditure admitted. The audit of expenditure in the Revenue Department was conducted by the ordinary establishment, assisted by two special auditors in the collector's office, and by one each in the sub-collector's and deputy collector's offices. Advances were also made to some medical and other officers for expenditure on account of famine relief-camps and hospitals. These officers accounted for these sums by vouchers obtained from parties from whom articles, &c., were purchased. In this way all the expenditure has been satisfactorily accounted for, except a small sum of Rupees 46 embezzled by some village authorities, who were prosecuted and punished by the magistrates.

Mr. Price.—At first there was no financial control at all. Money was drawn in lump sums or from the general funds without sanction. Every one did what was right in his own eyes. A general authority was given by the board to open relief-works, and in some cases works which could be gone on with or taken up were indicated and permission to undertake them was given. It mattered not in the early period of the famine whether there was an estimate or whether it was sanctioned or not. It was enough that work was required for the people, and, whatever it was, it was taken up. This state of things was soon altered, and the next step was that no work was to be taken in hand without an estimate and previous sanction; that no collector could sanction a work beyond Rupees 2,000; that money could, for works, be drawn from general funds up to the amount of sanction, and that for gratuitous relief should be drawn, as required, on a credit given at his discretion by the collector for each taluk, the money being debited to "Famine advances recoverable." The last stage was that Government insisted upon nothing being taken up without an estimate and sanction; that they cut down the sanctioning powers of collectors to Rupees 500;

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* This superior European agency was furnished in September 1877.

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that funds for works were to be drawn only on credits given by the examiner of Public Works accounts, on application from collectors, who had to account to that officer in the usual Public Works Department forms; and that all gratuitous relief money was to be drawn on a credit sanctioned by Government each month on an estimate furnished by the collector, the bills being sent in to the accountant-general.

I think the last-named system, as regards drawing money, about as good as could be found. I consider that as regards works there was a little too much red tape, and a great deal of certifying, writing, and so on, in which there was not the slightest use as no one could ever know whether what was stated was accurate or the reverse. Where a sudden emergency arose I should not hesitate, any orders to the contrary notwithstanding, to draw money from the general funds in my charge. I would not limit collectors in the way in which Government did; I consider the original limit of sanctioning power better. Having to write regarding petty estimates only increased correspondence.

Irregularities and frauds took place in the application of money, but I cannot state to what extent; I cannot give particulars of cases in the Cuddapah district. The most general form was putting down on paper far more coolies than existed, and accounting for the resulting short work by the statement that the coolies were too weak to do the proper task, or that they had refused to labor. Another mode was taking so much out of each cooly's pay, or making each man, woman, and child taken on give a *douceur*. We detected several men in such practices, and they were tried and punished. In this district I know of no frauds having been committed; a criminal charge was brought against a Mr. Love, but it broke down; I believe that he did embezzle a comparatively small sum, but a mess was made of the case, which occurred before I joined. It was currently reported in the Cuddapah district, and is here also, that many persons who were connected with famine operations have become enriched. I know myself of three or four cases in the upper ranks of natives, but it was of no use trying to get anything against them. Plundering, peculation, and fraud were, in my opinion, rife. What could be done in the way of checking was done; but the European officers of Government were too few to, until reinforced, cope with a host of acute natives, the majority of whom had but the one thought. The sessions judge unfortunately had very peculiar ideas on the subject of famine and the people connected with the management of it, and he very frequently, in appeal, quashed convictions for fraud which we all thought clearly enough established. The consequence was that things came to such a pass that, excepting in the most glaring cases, we simply turned the offenders away and took what salary was due to them. One native officer of very high position made, I believe, a good deal of money before I put it out of his power to do so. I could not prove anything, and no one would come forward to give evidence in a formal inquiry. I heard, however, that at the very worst period of the famine he was having jewels and ornaments made. I myself saw some of the latter. There were at first not sufficient means available in the matter of accounts. In the Cuddapah district, up to the beginning of February 1877, there was, I may say, practically no checking of expenditure or rendering of accounts, and there was no audit at all until the end of April, when a special establishment was sanctioned. The check upon expenditure was made upon weekly returns of amounts spent upon works, gratuitous relief, &c.; but there were for a long while but two divisional officers from whom these statements could be regularly obtained. We afterwards procured them from the others, but, until this was effected, there was nothing but the total expenditure for works and relief to check. There was certainly some considerable excuse for this. Relief had been begun in a hurry and under great pressure, no definite instructions had been given, and conflicting orders were being issued; nothing was ever said about expenditure. The cry was "save life," and the directions were "take on every one applying for employment." The consequence was that when this kind of thing was suddenly checked and accounts and system demanded, the staff was too small, with rapidly increasing numbers on relief, to work up the accounts, and they were at one time months in arrears.

Mr. Oldham.—The system laid down for financial control, for the sanction to works, and authority to spend money was entirely over-borne by the pressure of the famine. Funds never failed, and only divisional officers were entrusted with a discretionary expenditure of them, and this only in practice. Nominally they were not so entrusted. Under the circumstances I cannot see how this could have been otherwise.

I know of no cases in which irregularities or frauds in the application of money to any large extent have taken place. I have heard of two such cases, one of which is, I believe, baseless, and the other (a deficit in a tahsildar's accounts variously estimated at Rupees 76,000 or Rupees 67,000) is still under inquiry.

Nor is it anywhere currently reported in this district, to my knowledge, that any persons of any class engaged in the relief operations have become subsequently enriched.

On a minor scale peculation and malversation were perhaps the rule, not the exception.

The means for checking the expenditure and rendering and auditing the accounts were, during the pressure of the famine, insufficient. This part of the operations was, with one or two exceptions, conducted by special establishments, months after the expenditure had been incurred.

The result has been that, except in one taluk, the expenditure has been accounted for. Inconsiderable sums have been shown as deficits and as irrecoverable balances in cases of ascertained thefts and in default of accounts on the death of disbursing agents, and have been struck off under the orders of Government. In some taluks the accounts are completely satisfactory; in others less so, though in these it would be impossible to reject them, although some may be regarded with suspicion.

But even when describing an account as completely satisfactory its form only is alluded to. Unless when the actual expenditure came under the personal supervision of a superior officer there is no guarantee that an account, however satisfactory in appearance, does not cover a fraud. The most easily perpetrated frauds were those which could be covered by apparently good accounts.

Captain Awdry.—The whole outlay has been accounted for in many cases; the outturn has been perhaps one-third to a half less than what would be turned out in ordinary years for the money.

MYSORE.

MYSORE.

Colonel Sankey.—It will have been observed from my *printed Collection* that the only funds I had at disposal were those under the regular Budget grant, and that these were somewhat curtailed, and were threatened to be dangerously interfered with. I am happy to say that not even a breath of scandal attaches to the Public Works subordinates during the late famine trial. No relaxation in the rigid methods of paying and accounting usual with the Department took place so long as I remained at the head of the Department. Nothing could have exceeded the intelligence and devotion of all officers and subordinates; and I cannot speak

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in too high terms of the courageous and able management of the Department while under the direction of my friend, Colonel Johnson.

Mr. Ricketts.—My opinion is that peculation and malversation were not of so common an occurrence as some people suppose, and I have heard of no current reports of persons engaged in the relief operations having become subsequently enriched. He would be a rash man who said that there were no frauds. Frauds were doubtless committed and are being committed (as supported by detection) up to the present time. Fraud is not to be detected by the mere multiplication and auditing of accounts. In fact in many such cases there are insidious suggestions of frauds by underlings or others in order to gain the confidence of their superiors to be used for their own dishonest purposes thereafter. In fact, with this suggestion of fraud in others by those themselves fraudulent, added to actual case of fraud (mostly however of a petty nature), it may be said that there was a good sprinkling of fraud.

Relief accounts were carefully checked, and nearly all the expenditure (Government and Mansion House Funds) has been vouchered and duly passed in audit.

QUESTION 43.—PROPER FIELD FOR PRIVATE CHARITY IN THE VARIOUS STAGES OF A FAMINE.

What do you consider the proper field for private charity in the beginning, at the height, and in the decline of a famine? To what objects should it be applied, and through what channels? Should the funds be expended by Government servants who are also at the same time carrying out relief measures? Should they be expended in saving life and giving food? or should that be left entirely to Government, and the charitable funds confined to other objects, such as setting people up again in their pre-famine position, starting them again with a little capital, and thus assisting them with appurtenances which, though not luxuries, are not absolutely necessities of life?

Punjab, North-Western Provinces, and Bengal.—Private charity finds its sphere at the end of a famine, and also during the famine, in helping the more respectable poor who do not come on relief.

Bombay.—Private charity may be useful in towns in relieving the poor, and at the end of a famine in making grants of seed, grain, bullocks, and tools.

Madras.—Fifteen European and 3 Native gentlemen have replied.

When the crisis of famine is past, private charity may be employed with the greatest advantage in replacing the sufferers so far as possible in the position in which they were before the calamity fell on them. This may be done by grants for the purchase of seed grain, cattle, agricultural and trade implements and stock; and in carrying out this object the officers of Government should co-operate with private agency.

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Colonel Fisher.—I consider private charity should be restricted to two objects: 1st, at the height of famine the supply of food or money to those who, from circumstances beyond their control, are outside the scheme of Government famine relief; and 2nd, the setting people up again in plough-cattle, seed-grain, &c. at the close of the famine operations. The distribution of this charity should, in my opinion, be left entirely in the hands of respectable non-official native gentlemen, the Government servants only pointing out from time to time the localities where this charity could be most effective.

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Mr. Metcalfe.—Private charity should begin when Imperial responsibilities shall cease. Money subscribed during the progress of a famine should be nursed; and when famine operations cease may be best employed in assisting widows and orphans, in giving clothing, in helping to repair and build huts, in the purchase of cattle, seed, and household necessaries, and in helping artisans to recommence their trades. Charitable donations should be confined to such purposes, and not be wholly expended on the occasion of a general dearth in saving life, for that is an Imperial duty. The funds may be disbursed by circle officers at various stages of the famine as may be adjudged most beneficial to the sufferers from famine.

Mr. Marindin.—Though Government should retain the power of controlling the administration of private charity funds, I think the management of the actual expenditure upon authorised objects is best carried out by local committees composed of non-official native members. The funds may be most usefully expended in assisting people to start life again after a famine, but there are objects to which they may be beneficially directed during the famine itself, and which are primarily of more importance, such as providing for the necessities of families who are too respectable to come on to the Government relief lists. Local committees composed of native members are better able to search out such cases than European officials who, with the agency at their disposal, would be liable to overlook some cases and be deceived in others. Cotton spinning by respectable women can for this reason be managed best by local committees. The members of the committees, if they are properly selected, would be persons who could and would personally visit the abodes of persons needing or likely to need relief, and make themselves acquainted with their wants much in the same way as charitable ladies and gentlemen do in their visits to the poor in England.

Mr. Kirkwood.—I think, if it were necessary to draw a broad distinction between the field for the operation of private charity in a time of famine and the duties which must be left entirely to Government, I should say that it was the duty of Government to maintain during the time of famine, and that of private charity to restore to some small degree of comfort after the famine is over the lives which had been thus rescued by Government.

At all events, I consider that this is the field which most naturally and advantageously appertains to

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private charity. There may be surplus funds which may be devoted to other purposes while the famine is still raging; but as regards any such operation, it is most essential that the fact that Government is to the nation and the world at large wholly and solely responsible for the support of the starving population should never be lost sight of, and any measures undertaken in this direction by private charity must be under the complete control of Government and its officers.

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Mr. Norman.—I have already partially replied to this question in answering No. 26, chapter I. I think that private charity should always be administered under the supervision of Government officers. The funds raised in a town or city ought, in my opinion, to be chiefly devoted to the support of the local poor, such as usually subsist by begging. For this purpose, soup kitchens may be established and cooked food given, and it might be advisable to establish a house for deserted children and orphans. The funds may also be fairly expended in providing clothes for the destitute. At the close of a famine small gifts might be made for the purchase of bullocks, and seed-grain might be given to cultivators to enable them to sow their fields. Further than this I would not go. I think gifts of money to enable people to start again with a little capital would be a mistake. The money would soon be dissipated and wasted.

Mr. Spry.—I think that private charity should have full play in every way at the beginning of a famine, till it appears that the distress is greater that it can meet, when Government should step in. After that I think private charity should stop, or at least the expenditure of it should be merged in Government relief, unless a distinct line can be drawn as to what Government will undertake and what private charity will. For instance, if Government undertake to feed people, private charity might clothe them; but if feeding from both sources goes on simultaneously, demoralisation must ensue. As famine declines and people look to turning to their normal occupations, a fine field is open to private charity in giving seed and money to cultivators, tools and materials to begin with to artisans, and in redeeming necessaries pledged by people in the extremity of their distress.

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Sir W. R. Robinson.—Local charity may be left to local judgment and administration at all periods of a famine. It is too casual a matter for Government to meddle with, too uncertain for reliance in matters of life and death. At no period of its course can a famine or the famine-stricken be left to casual private charity in this or any other country with safety.

This question refers apparently however to the Mansion House Relief Fund. I think the administration of this relief—a very considerable portion of which went towards saving life—was on the whole good, though I myself should—under the contemporary restriction of State relief—have devoted a larger portion to direct relief of famine and distress as the primary object of such charitable effort. The share taken by many Government officers—as members of local boards of relief, and experienced and well-informed advisers in the administration of the fund,—was suitable, unembarrassing and very beneficial in every respect.

Mr. Longley—The best field for private charity would be setting the people up again in their pre-famine position by assisting them with small capital to make a fresh start in life. This cannot be done either in the beginning or at the height of the famine, for money given at either of these stages goes in food. I would, therefore, recommend the intervention of private charity at the last stage, *i.e.*, the decline of famine, when, encouraged by the bright prospects before him, the ryot would naturally appropriate the money to better his position. The dispensation of charity should be entrusted to superior officers of the Revenue Department, whose intimate acquaintance with the condition of the people would be invaluable in deciding who are the fit objects for the charity.

Mr. McC. Webster.—I do not think there is any field specially appropriate for the intervention of private charity at the commencement or height of a famine. Private charity when exercised by individuals is generally indiscriminate, and does more harm than good in a period of distress, as it demoralises the people, keeps them away from the poor-houses or works, and renders it more difficult for Government to get them under control. I doubt whether, even supposing there were a combination of the charitably disposed and a subscription list opened, the receipts would be in any way sufficient for the up-keep of a general system of poor-houses, and if it would not be sufficient, the establishment of one or two poor-houses would be of little use. Even with the unprecedentedly large amount of the Mansion House Fund, the general committee at Madras recognised the impossibility of meeting distress as the Government were meeting it, and confined their operations to a limited sphere of money-doling, the distribution of cloths, and what, in my opinion, was by far the most useful form of private charity, the distribution of money for the purchase or hire of ploughing-cattle and the purchase of seed-grain. This form of relief would be required later on when the next cultivating season came round, not at the commencement of distress when the agricultural classes would probably have ploughing-cattle and seed-grain. I think therefore that the appropriate field for private charity is at the end of the famine, and that it should take the form of helping people to recover.

Mr. Crole.—Its proper field is in aiding to reinstate persons in their pre-famine position. The distributories should be Government servants.

Mr. Austin.—Above all I would recommend the establishment of day nurseries for orphans, and other children, mostly found in villages and towns, whose parents hardly earn what is sufficient for themselves. This I consider the very best end to which private charity can be devoted. It has been tried both in towns and in some of the principal villages out of Mansion House funds, and is found to answer admirably well, and the result was the saving of a large number of valuable lives. Moreover, if children are neglected at this stage and their system once allowed to wear down, they can never fully recover the effects of the privation, and will naturally grow up but a weak generation, even if they managed to survive.

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Major Moncrieff.—Charitable funds should be confined to setting people up again in life, for instance, with bullocks, ploughs, looms, &c.; to giving little comforts in the hospitals, by establishing day nurseries for children and such like. Saving life and giving subsistence is the part of Government. From my experience the best disbursers of charitable funds are Government relief officers, but I am told that in Madras the missionaries rendered the most efficient help.

Mr. Ricketts.—Ordinary private charity in time of famine contracts, and I think it should be left to the donors it natives, to spend it as they liked and which would be mainly in food and clothing to the poor. Government servants may step in with advice so as to direct the various minor sources of private charity into one main end or object. In this respect, however, there should not be too much interference and no injudicious attempts made to check that charitable national tendency so remarkable in the natives of India. Private charity should undoubtedly be first expended in saving life and giving food and raiment, as it is impossible for Government, working on certain rules and principles, to deal effectually with every case of hunger, nakedness, or sickness.

I apprehend this question is put mainly with reference to the princely donations of the British nation known as Mansion House Funds. Even here it seems the province of Government to restore people to their pre-famine position, and to expend the Mansion House Funds in relieving actual distress. Starting people with a little capital and so on must be a consideration secondary to that of saving life, and one objection to the pre-famine view of the question is that probably some are helped who are really as well off as regards the necessaries of life as the donors. In fact I think Mansion House Fund distribution has gone a little too far and propped up some ryots who in the altered change of circumstances should for a time at least have descended to the scale of labourers. There is a strong suspicion, too, that certain part of these funds were diverted from legitimate purposes in order to help to meet the Government revenue demand, regarding which there was more than usual pressure by the novel system of postponements. Still it might be argued by some that even this diversion tended, as enabling the ryot to pay off his debt to Government, to give him a fresh start in life. On the whole, as the Mansion House Fund was so magnificent in amount, and as Government was spending munificently at the same time, it must be admitted that the restoring of persons by means of the former to their original simple status, and which in each individual case required but a small amount of money, was an extremely fertilizing way of using the money and probably checked much privation in the future, which the mere bestowing of alms, as such, would not have done. A too profuse distribution of mere food and clothing would have produced demoralization and tended to aggravate in the long run the state of things it was intended to mend. Whereas in helping ryots and others to replace their cattle, rebuild houses, buy seed grain and start their looms and other industries again, the country has been made flourishing, and permanent prosperity and consequent less poverty secured.

Question 44.—After effects of Famine on the Country.

What has the effect of famine been, in your experience, on the subsequent condition of a district? Where villages were deserted, have they been permanently depopulated, or has the population returned to them? Has much land been thrown out of cultivation, and for how long has this decrease in the cultivated area continued? Has it been due to want of cultivators, of plough-bullocks, or of capital and of seed-grain?

Punjab and North-Western Provinces.—If the population is sparse it recovers slowly, as was the case in Jhansi after 1868. In most of the North-Western Provinces, one or even two years of famine would not permanently reduce the land in cultivation.

Bengal.—Opinions are expressed that both the Orissa and Behar famines have been actually beneficial, that the recovery of advances from the ryots has impressed thrift, and that trade has been stimulated. Cultivation had recovered itself in Cuttach by 1870, and in Behar was never much affected.

Bombay.—The effect on the landed class has not been very injurious.

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Mr. Story.—The after-effects of a famine in a district depend if the population of the district is large or not; if the population is large the district soon recovers itself; if small, as for instance Lalitpur and Jhánsi, the effects of the famine last for years, a lot of land is thrown out of cultivation, and villages become almost deserted. There are villages of this kind in the Jhánsi district that have not yet recovered from the famine of 1868–69.

Mr. Lumsden.—In my experience (confined to Gorakhpur and Rae Bareli) the effects of famine on the condition of a district have been temporary as regards depopulation and the decrease of land under cultivation. In Gorakhpur certainly no villages were permanently depopulated after the famine of 1873–1874, and any land thrown out of cultivation was again brought under the plough the very next season. In Rae Bareli the famine is only now ceasing to be, but there is nothing to lead me to believe that here either any villages will be depopulated or land allowed to lie waste for any length of time; indeed, the experience of the present kharif season shows that with seasonable weather all the land which has been thrown out of cultivation will at once be brought under the plough. Even during the present kharif season, with the exception of bijar dhan land (for the cultivation of which sufficient rain did not fall at the proper season, and rice seed was very scarce), it has been ascertained beyond doubt that there is more than the usual area under cultivation.

I am not, of course, prepared to say that the evil effects of famine in depopulating the country and throwing land out of cultivation would not be of a more permanent character when the famine was of longer duration and its severity more intense than has been the case in the instances of which I have personal knowledge. On the contrary, I believe that the effects of famine would under such circumstances be more permanently felt; but even then, I think, pro-

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vided the population of the tract affected were not decimated it would not be many seasons before the average extent of land was again brought under cultivation. With the demand and competition which now exists for land, the few other openings there are for the bulk of the population, and the rude and primitive nature of the implements necessary to enable a cultivator to start a small farm, and the facility with which the necessary funds can be raised (although at a ruinously high rate of interest) for such a purpose, I am certain, in these provinces at least, it would take more than one or even two years of famine to have any lasting effect in reducing the extent of land under cultivation.

The cry of the natives in Oudh seems to be that since our rule was established in the province there are not the same openings which there used to be in Nawabi times for employment in Government service, and that all are now forced to look to agriculture for the means of subsistence—a fact which has increased the competition for land, led to an enhancement of rent-rates, a diminution of the average size of agricultural holdings, and has generally reduced the means and social position of those engaged in agriculture as the means of earning a living.

I am distinctly of opinion, as far as my experience goes, that even the temporary diminution in the extent of cultivation consequent on famine has been attributable to difficulties in procuring plough-cattle or seed-grain, not to the want of cultivators.

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Mr. Barlow, Bhagulpore.—None of the permanent evil effects described in these questions have been remarked as having followed the season of 1873–74 in this province.

Colonel Burn, Durbhunga.—Very disastrous; it takes years for the ryots to recover the effects morally and financially. No Raj village was depopulated during the famine or since. A good deal of land was thrown out of cultivation in some villages, and it is not yet all taken up again; but where river irrigation was available, and Koiree or Gwala cultivators preponderated, there are now no waste lands owing to the famine. We supplied seed-grain in large quantities, and lent money to our ryots; bullocks are not deficient. The fact is, it was scarcely a cattle famine; the bullocks were, so to speak, in clover, as they ate up the half-grown but withered crops, and the rains brought them pasture.

Mr. Worsley, Mozufferpore.—The effect of the famine on this district has been, on the whole, good.

The determination which has been shown to collect the famine advances, though tempered by great moderation as regards the instalments, will prevent the ryots in times of future scarcity or famine from taking advances rashly or unnecessarily. The ryots have become more careful of their grain, and will part with any property they can dispose of rather than sell all their grain after a short harvest. The district has been supplied with a large number of good tanks and good roads, and to the famine may perhaps be due the construction of the Mozufferpore Railway. The effect, again, has been excellent in a political point of view. No villages were deserted in the famine. More land has come under cultivation.

Mr. Hodgkinson, Sarun.—The cultivated area of the district was not affected by the famine of 1874. Land in a district so closely inhabited is necessarily in great demand, and a decrease of 25 per cent. of the population would not, in my opinion, make any material difference in the area under cultivation. If a holding is given up, it rarely remains unsettled for even a single harvest. But the effect of the 1874 famine on the people has not been transient. The harvests since then have not in a single year been up to the average, and the recovery of the large advances made during 1874, under such circumstances, has pressed hardly on the cultivating class generally. But I have no reason to believe that the general impoverishment will be permanent, for the fertility of the soil is such that even one really good year of harvest would revive the depression, and put an entirely new face upon the district.

Mr. Toynbee.—My only personal experience of the after-effects of famine was in Orissa. By the end of 1868, and beginning of 1869, all outward traces of famine (except the village Golgothas) had passed away. Many people returned to their homes; the land was fully tilled, the revenue fully realised. The capital brought into the province, and the improvement of its communications by means of canals, left it far more prosperous after the famine than it was before it.

Mr. Finucane.—In the Dinagepore, Monghyr, and the greater part of the Durbhunga district with which I have been connected, the famine of 1874 did not lead to the depopulation of villages. In the north of Madhubain and Soopool subdivisions, where, within the past 15 years, there have been three years of serious failure of crops, there has been considerable desertion of homesteads. In pergunnah Alapur, which is the worst tract in this respect, 26 per cent. of the cultivated area was thrown out of cultivation in 1874, 1875, and 1876. This was principally owing to the scarcities of 1873–74 and 1875–76, but in some degree to other causes also; some of the area thrown out of cultivation was again brought under cultivation in 1876–77. Much more has been brought under cultivation during the present year, and all will probably be under cultivation next year.

Mr. Kirkwood.—In Bhagalpore district (1874) the relief given was so ample that I doubt any additional mortality having taken place during the year. Those few who died from the effects of starvation were, I think, fully made up for in numbers by the lives preserved in the case of aged, feeble, and diseased persons who in an ordinary year would probably have perished. No villages were deserted, no land was thrown out of cultivation. The famine over, things at once resumed their normal state. I believe there was widely diffused among all classes in North Bhagalpore, from the wealthy landlord who had spent considerable sums to the poorest hand-to-mouth liver, a genuine sentiment of admiration and thankfulness, both for the result secured and the manner in which it had been brought about.

In Cuttack (1866–67) things were different. An enormous mortality was accompanied by numbers of deserted homesteads and fields. In some instances whole villages of the poorer and smaller stamp were thus deserted. Where whole villages have been deserted, I am unable to say that within my recollection they have again been repeopled. The deserted lands have generally, I think, in such cases (which, so far as my memory serves me, were not many), been gradually taken up by cultivators of the neighbouring villages. Partial desertion of villages to the extent of one half, or even more, of the houses was by no means uncommon. In such cases those who remained generally took into cultivation a portion of the deserted lands, while other portions were gradually taken up by the more wealthy cultivators of neighbouring villages which had fared better. In many cases homesteads which had been at first deserted were in subsequent years gradually re-occupied by some surviving members of the family who had fled to Calcutta or elsewhere; and the instances, if I remember right, were not few in which such persons laid claim in the courts to their ancestral lands, which since the famine time had been rented to others.

In the year 1866 there was in Cuttack much land out of cultivation, but not more, I think, than was proportionate to the loss of population. In 1867, though much land still remained untilled, the cultivation was, proportionately to the population, greater than in the pre-famine years. Year by year the area of cultivation increased, until, by 1870, it had fully resumed its normal extent, and had even passed it, for the canals and improved embankments had by that time admitted of considerable areas, which had always lain waste, being reclaimed. This latter process was continued in subsequent years.

The diminished population was the main, if not the sole, cause of the defect of cultivation in 1866 and 1867. The supply of seed-grain was wonderfully preserved even in those years of keen suffering. In 1867 the seed-grain used was entirely procured by the people themselves, except about Rs. 3,000 worth, which was distributed by the relief agency. This feature is, I think, one of the most surprising in connection with Indian famines. The seed-grain hoards are generally largely in the hands of the local zemindars and mahajans, whose solvency depends on their tenantry and debtors being able to cultivate the land, and I imagine this fact in a great measure accounts for the phenomenon.

In Bhagalpore (1874) a failure of seed-grain was apprehended, and some 15,000 maunds were imported by Government. Of this quantity we sold about 2,000 maunds, and advanced to zemindars and cultivators about 10,000 maunds. The people themselves had retained large supplies.

In Bhagalpore there was no loss of cattle; the vast churs of the Kusi river, which separates North Bhagalpore from Purneah, are annually turned into a great pasture ground for the cattle of both districts. In Cuttack there was some loss of cattle, but no special measures were adopted. The surviving cattle sufficed for the wants of the surviving population.

For some years after the 1866–67 famine was over about a thousand women, who had been in our light-labour gangs on the canal works in Cuttack district, stayed on as labourers upon those works, forming settlements of their own. Gradually these hard-working creatures made domestic arrangements and settled down for life with some man, but when I left Orissa in 1872 these female gangs were not yet altogether broken up. They were much approved of by the canal officers, who found the women constant in their attendance and very hard-working.

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Mr. Nicholls.—*Effect of Famine.*—I served in Bilaspur in the years 1873–74. At that time there was not a trace observable of the preceding famine; it was seldom spoken of, unless questions were asked about it. I have very recently been in the Murwara Tahsil, and the country appears to be much better off than it was before the famine.

Deserted Villages.—Apparently the population has generally returned to them. No villages appear to have been depopulated, except in Raipur, where the habits of the people are particularly migratory. "People left the distressed tracts in large numbers owing to the inability of the landlords to support them, and 14 villages became deserted, and were recommended to be absorbed into the Government wastes. Other villages with 40 or 50 ryots are reduced to two or three. In most cases the malguzars are poor, and will take years, perhaps will never, be able to recover, in consequence of the reduction in the number of cultivators, and reduction in the area cultivated. The poverty of the landlords will be an effectual bar for some years to come to their being able to replenish their agricultural stock or bring their villages up to their former state of prosperity."

The 14 villages mentioned above were brought into the district unreserved forest area.

Land thrown out of Cultivation.—Notwithstanding the great exertions made at the sowings of 1869–70 to recoup by extending the area of cultivation, it seems that the cultivated area receded by 73,563 acres from what it had stood at in the year before. In 1869 the area was 1,849,874 acres. In 1876–77 it was in excess of 2,350,000 acres.

In Shargarh (of Saugor) the cultivation recedes from 15,188 to 9,983 acres.

Out of the 1,436 villages in the Bilaspur and Seori narain tahsils in the year 1869–70 only 466 villages were fully sown, and 534 were two-thirds, 405 half sown, and 31 were more or less waste.

Making every allowance for the effects of the cholera epidemic and the great losses among the cattle, beyond doubt a great portion of this decrease in the cultivation was due to the want of seed grain.

In the Murwara Tahsil the course of cultivation is thus shown:—

1866–67	248,937
1867–68	240,165
1868–69	203,969
1869–70	171,681
1870–71	180,317
1871–72	185,543
1872–73	178,285
1873–74	199,867
1874–75	211,588
1875–76	222,768
1876–77	248,630

Cause.—The Deputy Commissioner of Saugor was of opinion that in Shahgarh it was owing to the neglect of the tahsildar to urge the giving of taccavi advances for the purchase of seed grain.

In Murwarra I attribute it to the loss of cultivators through the cholera and small-pox epidemics, perhaps also directly to deaths from famine, and in the second place to the great mortality among the cattle. The matter of seed grain was adequately met by Government help. I am inclined to think that it might have been better not to have looked strictly for security on such advances, for it appears to me that a loan of seed grain, especially if made by Government, would, as a matter of fact, be regarded as a sacred trust, and that bad debts would hardly be made. According to the custom of the country a debt for seed grain is allowed precedence over all others. In such cases the management of the total advance for each village had better be entrusted to the malguzar. In Bilaspur much is believed to have been due to the want of seed grain, as well as to the losses of cultivators by death and migration, and the excessive loss of cattle.

In Raipur the same causes reduced considerably the number of cultivators and of agricultural labourers, while cattle disease or the effect of want of food and exposure swept off a third of the cattle of the district. The Deputy Commissioner noticed that "the seed grain difficulty, in so far as it could be met by the action of Government, had been dealt with, and up to the 30th June, 1869, advances aggregating Rs. 10,135 had been made. The applications would have been much more numerous, but for the local custom called 'barhi.' No one who could get seed grain by this customary process would dream of borrowing money from Government to purchase it, because the great difference (perhaps 400 per cent.) in price between grain now and at harvest time would necessarily entail a loss much greater in degree than that resulting from the payment being made in kind."

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Mr. Propert.—The scarcity of the two years past has, as regards Khandesh, left the people in a very impoverished condition. Cattle have died in large numbers, ornaments have been disposed of freely, but I cannot say that villages have been permanently deserted or that any decrease in the cultivated area has been caused. In fact, at the commencement of the season of 1877 new land was taken up in many places, and this I think proved how very hopeful the people were as regards the future. In many cases, however, the land was not even sown, as the rains during the season of 1877 were up to the end of August most unsatisfactory and insufficient. If the coming harvest be plentiful, I do not consider that the people of the district will as regards means of living, be worse off than before the late scarcity.

Mr. Moore.—The effect of the late famine, the only one of which I have any experience, has been less disastrous than it might have been, owing to the timely measures adopted by Government. The respectable poor, higher in the social scale than labourers and cultivators, severely felt the high prices, but they have outridden the storm. The better class of cultivators have lost a great many head of cattle, but the labourers and ordinary cultivators, who live from hand to mouth, have been supported on our large works, and are no worse off than before. No villages have been entirely deserted nor permanently depopulated. Much land has not been thrown out of cultivation, and what has been so thrown out does not exceed the area remaining uncultivated in an ordinary year. Famine does not appear to have caused any appreciable decrease in cultivation. What there is is principally due to temporary emigration.

Mr. Hamilton.—I believe that at least one quarter of the population has disappeared from the villages of this district since the monsoon of 1876. But it must be noted that last season was quite as bad as the one before it, although relief operations were not in progress to any large extent, nor was it recognised as a famine by Government, as only a small area of the whole presidency was affected.

Much arable land is uncultivated, but this is probably due to the high price of seed as well as to the scarcity of cattle. In the large taluka of Kopargaon (area 505 square miles, population 64,000, number of villages 125) only 64 holders of land will be ousted by the Revenue Department on account of long absence and defaulting revenue, so that it is pretty clear that the bulk of the missing population are not cultivators, but are persons, such as mhars and jaglyas, whose livelihood depends on the prosperity of the cultivators themselves; and these are the very people, as before observed, who first feel the effects of a bad season.

My own observations distinctly point to the conclusion that the agricultural population which has no beneficial interest in the land has suffered more than the landholders themselves.

MYSORE.

MYSORE.

Mr. Ricketts.—I have had no experience of previous famines, but I have seen enough of the Indian ryot to know that he possesses wonderfully recuperative powers.

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QUESTION 45.—AFTER EFFECTS OF THE RECENT FAMINE.

In the case of the recent famine, what effects such as those just referred to have been produced? How many villages have been deserted, how many have been seriously affected; what is the reduction in the area under cultivation now compared with what it was two years ago? How many holdings have been abandoned? Have the landlords, or ryots with whom the settlements are made, been permanently impoverished in a serious degree? Is there any reason to anticipate increased difficulty in realising rents or land revenue for the next few years by reason of the recent pressure, if the seasons are favourable? What proportions of landlords or ryots are likely to be dispossessed of their holdings through the action of the Revenue or Civil Courts, as a consequence of distress produced by the famine? Has the agricultural population which has no beneficial interest in the land suffered more in proportion than other classes?

Punjab and North-Western Provinces.—Villages have not been deserted. The tenants have suffered more than the landlords, and the landless class more than either.

Bombay.—Some small villages were deserted, but the people have returned to them, and a large area has gone out of cultivation.

Madras.—Thirteen European and three Native gentlemen have replied.

Statistics are given, but the question was in the opinion of some officers premature, as it was still not known how far emigrants would return.

NORTH-WESTERN ROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sandys.—The failure of a single harvest has affected the agricultural population of this district as defined in Question 8, Chapter I., only so far as to add generally to their already heavy debts to the money-lenders, usurious interest having been charged for all advances made during the time the distress continued.

Villages have not been deserted or permanently depopulated, and two thirds of the persons who left them are said to have returned. A much larger area than usual was under the rabi crop, and the area under the present kharif is more extensive than in an ordinary year.

The loss of almost the entire out-turn of one harvest, followed as it was by an out-turn above the average of the next harvest, has not permanently impoverished in a serious degree the landlords or tenants in this district, and if the seasons are favourable there is no reason to anticipate increased difficulties in realising rents or land revenue for the next few years by reason of the recent pressure.

The number of estates sold by order of the civil courts and number of tenants ejected by order of the revenue courts were for the current agricultural year, as compared with the number in the previous year, as follows:—

	No. of estates sold.	No. of tenants ejected.
From 1st October 1877 to 30th August 1878	403	348
From 1st October 1876 to 30th August 1877	387	759

Of the agricultural population the chamárs, khoris, and ahírs have been the greatest sufferers. They have generally no beneficial interest in the lands, being merely field labourers at the harvest times, and at other times gaining a subsistence as best they can by working in leather, cleaning hides, making coarse cloth, and tending cattle.

Mr. Kennedy.—No villages have been deserted. There has been a falling of about one fourth in the area under kharíf compared with that two years ago. The land thrown out of cultivation is chiefly poor rice land. There was some difficulty about plough-bullocks. Advances by the baniyas were limited, and there was a great want of rice seed-grain. Judging by the returns of a large estate in the worst part of the district, one eleventh had died or fled and four-elevenths had been considerably impoverished.

About one twelfth of land revenue will probably remain unpaid at the end of the year, but the greater part of this will be recovered within a short time. The proportion of rent which has been realised by the landlords is much smaller; more than one third at least remains unpaid, and a considerable part of this will have to be abandoned. The famine has considerably accelerated the sale of land by the civil courts.

Mr. Lumsden.—I have in my answer to the previous question indicated generally my opinion on the points alluded to in the first three queries put in this question; but it is too early to attempt to give actual results in figures, as it is only since the middle of August that the famine can be said to have come to an end, and there are still relief works open.

I have no doubt many ryots have been permanently impoverished to a serious extent through the recent drought, but I question if any landlords have been permanently impoverished in a serious degree. In the tahsíl where the pressure was greatest and the failure of the kharif most complete 4 annas of the Government demand has been suspended, which will give substantial relief elsewhere; also, though formal suspensions have not been sanctioned, great discretion has been used in enforcing payment, and the balance outstanding at the end of the year will therefore be heavy.

With our present excellent prospects, however, it is hoped the greater portion of this balance will be got in during 1286 Fasli. In some few cases, however, it may still be necessary to sanction suspensions, postponing the demand for a longer period.

With favourable seasons during the next few years, I certainly do not consider there should be any increased difficulty in realising rents or land revenue in this division.

Certainly the agricultural population which has no beneficial interest in land has suffered more in proportion than other classes.

BOMBAY.

BOMBAY.

Mr. Spry.—No villages have become actually or permanently deserted; but in many villages the majority of the inhabitants left during the famine. These people, or at least the survivors, have gradually returned, and are even now doing so, the present cultivating season being a very favourable one. Till this cultivating season has expired it is impossible to give any exact data as to the decrease, if any, of the area under cultivation compared with that of two years ago, because ryots returning resume their occupation at the last moment. The landlords have certainly not been permanently impoverished, although many have been much pinched from not getting their rents. As regards the ryots, the better classes of them who held grain stocks have profited rather than lost by the famine, in that their stocks commanded such exorbitant prices. The middle and lower classes suffered much, but they are a thrifty race, and in course of time, provided favourable seasons follow, will regain their normal condition. The greatest blow to agriculture has been the loss of plough-bullocks, which was very great. I do not anticipate much difficulty, if any, in realising the land revenue, provided the crops are at least average ones. I do not think that many landlords or ryots will be dispossessed of their holdings through the action of the revenue courts, as I have avoided and do avoid such extreme measures. Of the civil court I cannot say, although undoubtedly much land has been mortgaged and sold to wealthy people. The lower classes of the agricultural population have undoubtedly suffered terribly, but I think they are about on a par with similar classes amongst the urban population.

Mr. Percival.—Many small villages were entirely deserted in 1877, but they are all now very much as they were before. People are still returning, and the reduction in the area of cultivation cannot yet be judged. A considerable amount of inferior land will go out of cultivation for a time, but the return from such lands is so uncertain that it is doubtful if this is to be regretted.

MADRAS.

MADRAS.

Mr. Longley.—In 1,136 villages more than 40 per cent. of the population were missing; what proportion of the missing must be credited to desertion from the village and what to death it is impossible to say without further information, for which I am now seeking.

The area under cultivation in the official year 1875-76 was 1,101,158 acres, and in the year 1877-78 865,881 acres. This reduction is 22 per cent. The above figures do not include the cultivation in zemindari, &c.

Rent Roll.		Number of holdings abandoned.
Puttas paying below 10 rupees	-	17,847
Puttas paying between 10 and 30 rupees	-	5,033
Do. 30 and 50 „	-	236
Do. 50 and 100 „	-	27
Do. 100 and 250 „	-	7
Puttas paying above 250	-	—
Total	-	23,150

Note.—These numbers are significant as showing the class who felt the pressure of the famine the most.

Yes. Landholders whose holdings have been abandoned may be considered to have been permanently impoverished in a serious degree. Such consist chiefly of small puttadars paying a revenue of under Rupees 50.

There is not much likelihood of these ryots reverting to their previous condition for the next few years, however favorable the seasons may be, as they will not have sufficient funds to resume their usual occupation. For this reason I apprehend serious difficulty in the recovery of the revenue from such small landholders.

Yes; on account of suspension of labor in the fields.

Mr. Crole, Nellore.—The famine has thrown this district back five or six years. Many villages have been partially depopulated. The loss in population ranges from 28 to 34 *per cent.* on the Census of 1871. Few villages have been entirely depopulated. All have suffered. The decrease in cultivation up to date as compared with two years ago is about one-third.

There will for some time be increased difficulty in realising the revenue. The agricultural population possessing no beneficial interest in the land have suffered much more in proportion than other classes.

Mr. McC. Webster.—The dry cultivation up to August of this year compared with the cultivation up to the same period in 1875 (1876 was a bad year) is 610,905 acres in the present year, against 587,187 acres in 1875. It is not possible within the time allowed to collect information as to the number of holdings abandoned, but the number of acres abandoned since 1875 is acres 8,531. This refers to lands given up by ordinary "Rajeenamah," and does not include lands which have been deserted. We have no record of the latter.

If the seasons are favorable there is no reason to anticipate increased difficulty in realising rents or land revenue for the next few years by reason of the recent pressure, though there may be difficulty in realising the arrears of this and last year. It is not possible to estimate the numbers of ryots likely to be dispossessed, though the records of the registration offices show that there has been a great increase in sale and mortgage deeds and money bonds. Distress has been equally heavy on all the poorer classes, agricultural laborers and weavers having suffered most.

Mr. Price.—I think, with all deference, that this question is rather premature. No villages have been actually deserted. I quote from a report received today (16th September) from the relief officer in charge, Ponnéri taluk, which will show how difficult it still is to make any reliable estimate in regard to the number of the population who have permanently deserted their villages in consequence of the famine. Mr. Innes, who is a good and active officer, and who has been some time in the Ponnéri taluk, writes—"An immense number of the able-bodied cooly class who left their homes in search of employment have returned to their villages." Between March and the period of which Mr. Innes writes, a very large number of people must have returned. I myself, when in the taluk, ascertained this. The 10 per cent. difference found in March between the Census of 1871 and that of this year cannot therefore now really exist, and whatever difference might be found on a second census would have to be divided between deaths and absentees, to the former of which causes by far the larger number of cases would have to be assigned. Generally speaking, I should say that very few, if any, villages in this district have been seriously affected by the desertion of the population. I have recently had every reason to believe that the accounts of cultivation sent in in this district are utterly unreliable, and that the practice is not to write them up at all until August or September. In more than one taluk of this district I found that the cultivation up to June was entered as "nil," whereas, as I have personally ascertained, such was not the case. I enclose the last comparative statement of cultivation. This, I am perfectly convinced, is not yet correct. I know, from what I have seen when moving about, that the cultivation must be more than is stated. I believe that the return for October will show the cultivation nearly, if not quite, up to the mark. Two causes tending specially to decrease cultivation in this district, if any such decrease has occurred, have been—

(1) That, pending the introduction of the new settlement, the disposal of durkhasts was under orders of the board, suspended for something like two years.

(2) That the introduction of the new settlement has, as it always does for a brief period, given rise to more frequent relinquishments than are usual.

The number of holdings abandoned cannot be stated as the annual settlement is not yet over. I do not think that landlords and the better class of ryots, especially the former, have been permanently impoverished in a serious degree by the famine. They have in most instances, no doubt, suffered severely and it will be some time ere they will be in the same position as the famine found them. Many will, I believe, never recover their former status, but these will not be the laborer, the landlord, or the ryots, who live wholly on the produce of their lands, but the very small farmer. These have parted long ago with their lands and what they had, and have descended into the laborer class from which, with rare exceptions, they will not, in the present generation at any rate, emerge. As for the better class, two or three good seasons will set them right, and the laborer will, as soon as prices fall, be as well off as he ever was. The landlords, *i.e.*, the puttah-holders, who are absentee proprietors, have suffered from high prices, and may have lost a part of their rents during the years of scarcity, but they will as a class take very good care to make this up when the favorable seasons come. I do not think that, as far as this district is concerned, there need be any difficulty, under the condition named, in collecting the rents and land-revenue as usual, at any rate after the crops of this year are in. It is impossible to say what proportion of landlords and ryots will be dispossessed of their holdings, through the action of the Revenue or civil courts, as a consequence of the famine. I could not say, even make a guess on this subject. The sales of land on account of arrears of revenue are thus far but small, and collections are making very fair progress.

As for sales by civil courts they cannot be many, as suits have fallen off a good deal, and, as far as I know, the applications for transfers under court decrees are but few. My experience of the famine has been that where money was lent to the ryots, it was but very seldom indeed upon the security of land, and that where that was the security, it was generally of so valuable a class that the owner would take good care not to part with it. I do not quite understand the bearing of the concluding portion of the question. If by "the agricultural population which has no beneficial interest in the land" is meant the agricultural laborer *pur et simple*, I should say that he is no worse off than others; but if the construction to be put upon the sentence is the occupier but not the owner of the land, then I should say that he has suffered more in proportion than the other classes. The ordinary ryot has had a very large proportion of the demand against him remitted, whilst the cultivating occupier has had to pay up to his landlord whenever possible to force him to do so; he has had no relief, but what he could get out of Government as a pauper either on works, in a poor-house, or on village relief.

Mr. J. G. Horsfall.—I do not think that any

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MADRAS.

villages have been permanently deserted on account of the recent famine in this district. The general deputy collector states that in his division one hundred villages were deserted, but it is too soon to say whether this was only temporarily or not. In September last I met hundreds returning to their villages on my march from Guntur to Bezwada.

Our returns will show that there is a slight reduction in the extent cultivated this year compared with that it was two years ago.

Mr. Oldham.—No villages have been depopulated or deserted during this last famine. The amount of land thrown out of cultivation this year in some villages amounts to 50 per cent. This has been due to want of cultivators, of plough-bullocks, and of capital combined, not to want of seed-grain unless when its want was due to want of capital.

From January to May 1868 I was almost without interruption in camp in different parts of the Kendrapara division of Cuttack. My recollection is that, with the exception of some deserted hamlets, or rather groups of houses, there was not then a trace of the famine visible.

Mr. Weekes.—Some villages in one of my taluks of Cuddapah suffered great losses from fever. I was told that one large village was nearly deserted and had a census taken of it which I sent to the collector. I have not it by me to refer to. Fever following famine was very disastrous. Several villages in Kurnool have suffered very much from famine, and some hamlets have only two or three houses occupied. I have seen one or two deserted hamlets, but am not sure whether they were deserted in the last famine or before. I do not know the amount of the reduction in area of the cultivation except that in the Pattikonda taluk of Kurnool. The area under cultivation up to March 1878 was 183,183 acres compared with 257,822 the average of the previous three years, or little more than two-thirds. The Cuddapah ryots, or rather the bulk of them, have not, I should say, been permanently impoverished in a serious degree except by the loss of bullocks. Many of the smaller ryots must have parted with their lands. They are exceptionally good farmers and substantial men, and made large profits during the Lancaster cotton famine. I have not seen such good farmers in India, except the European indigo planters. The poorest ryots have suffered no doubt permanently in a serious degree, but the great cholum harvest of 1877-78 which was magnificent in Jamalamadugu has enabled nearly all to redeem the lands which they had mortgaged. I heard that a well-to-do missionary had all his mortgages paid off by the mortgagers. Nearly two years' harvest in one and high prices have been the saving of all the Jamalamadugu ryots that could cling to their lands. Those who lost bullocks and had to sell their land must have bitterly regretted doing so. The Kurnool ryots seem a poorer lot. Different districts and parts of districts have not suffered in the same way. I should not anticipate any difficulty in realising revenue in my division in Cuddapah, though the loss of cattle must make the land less productive. There will be no difficulty in finding cultivators, as I have often heard non-cultivators complain they could not get lands, and that the ryots were the only people who were well off. In fact they would like an agrarian law. The famine will have caused many small holdings to pass into the possession of village Reddies, Curnams, and other well-to-do persons.

MYSORE.

MYSORE.

Mr. Ricketts.—Some 63 villages and hamlets have been deserted and some 1,800 villages have been seriously affected in the recent famine. Though a village may be deserted yet some of its land is still under cultivation, the survivors having gone to reside in neighbouring villages for the sake of company or safety.

The reduction in the area under cultivation now compared with what it was two years ago is some 13,440 acres.

The number of holdings abandoned is some 4,320.

Landlords and ryots have in one sense been permanently impoverished to a serious degree, as they have had to part with much jewels, cash, and cattle, in order to purchase food. But wealth in jewels and buried rupees is in a great degree unproductive, so that the impoverishment above referred to will (save as regards future famine contingencies) not be apparent and even will not be felt physically (through moral wants may not so kindle and aspire owing to loss of material wealth) in the matter of grain crops and general farming. I have recently visited a taluk, Anikul, much affected by the recent famine. Its whole length and breadth presented almost the same amount of cultivation as in ordinary years, and that too not indifferent culture, but carefully ploughed and weeded fields, and as a consequence a most luxurious growth of crop.

The agricultural population which had no beneficial interest in the land have suffered more than those possessing a beneficial interest owing to general inferiority in industry, intelligence, and the like, but as compared with "other classes" they have probably suffered in a less degree.

CHAPTER IV.

Ch. IV. Qn. 1.

QUESTION 1.—PRACTICAL USE OF SUCH SCHEMES.

After 1868 the Government of India gave instructions that schemes of works should be prepared, suitable for execution in the event of famine. Were such schemes ever prepared? If so, have they been found of practical use during the recent pressure?

SUMMARY.

No general scheme of famine works seems to have been prepared except in Bombay.

Punjab.

PUNJAB.

Lieut.-Gen. Maclagan, R.E., says that there is no scheme or record of works specially proposed for famine relief with reference to the experience of 1868, apart from the general list of estimated and sanctioned works waiting for an opportunity of being carried into execution. The instructions of the Government of India referred to have not been traced in the records of the Public Works Department. In the famine of 1868, and in the scarcity which prevailed in certain parts of the Punjab in 1878, small local works such, for the most part, as would have been carried out in ordinary course, were opened in the districts affected, and sufficiently met the demand for employment of this nature.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Mr. W. C. Plowden, Meerut, says that no schemes were prepared until 1877, as the years 1869–76 were favourable.

Mr. R. D. Spedding, Gorakhpur.—Schemes of proposed works were prepared in this district, and included mainly road improvements, terminating with a railway work in the event of extensive labour being found necessary.

Mr. R. M. Edwards, Rohilkhand, was not in the division from 1868 to 1875, but he never heard of these schemes, and he does not think that any were prepared.

Bengal.

BENGAL.

Colonel Cadell.—The instructions given by the Government of India after 1868 for the preparation of schemes suitable for execution in the event of famine were carried out. Rough schemes were prepared, and they were found practically useful.

Colonel Haig.—With regard to questions 1 to 11, I would premise that they appear to me to be all based on an assumed state of things which need never exist, and which, with a wise, cautious, and very moderate outlay upon irrigation, navigable canals, and railways, could not possibly exist. The assumption seems to be that the normal condition of the country is to be one of constant risk of famine; that Government is to be perpetually on the watch for the invader whose inroads may be expected at any moment; that special provision is to be made to meet the invasion, a strong force kept in hand for the purpose, all in readiness to be set in operation at the shortest notice; in fact, that there is to be a Famine Department as a regular branch of the administration of the country, just as I believe there is actually a famine chapter in the new Public Works Code.

An assumption more utterly baseless, as far as Bengal is concerned, cannot be conceived. The province can be placed beyond all possible reach of famine at a very moderate outlay upon a few well-considered schemes, which might be carried out in a regular way, under the ordinary rules, at one-third what they would cost if executed in the confusion and hurry-scurry of famine, and which would, after payment of working expenses and a portion of the interest, leave a comparatively small annual charge to be met partly by a charge upon the Imperial treasury, and partly from the proceeds of special taxation, as in the case of the present Public Works Cess. There is not the slightest occasion for plunging into schemes costing scores of millions of pounds. The only result of all the wild talk of this kind is panic, and a settled determination to do nothing lest the Government should be committed to undertakings involving national bankruptcy. All that is necessary would be to ask each local Government what works it considers necessary to ensure a sufficient supply of food in the country under its rule in all years, together with proper means of distribution. The replies would be simple; the schemes would be those worked out by men who really know the country and its resources, and the outlay required would, I am persuaded, after revision of the proposals of the local Governments by the Government of India, be found to be quite moderate and practicable. This much premised, I proceed to answer the questions seriatim.

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Bengal.

No schemes of works specially suited for construction in time of famine have been prepared since the orders of the Government of India upon the subject in 1868. One or two large schemes, such as the Rajmahal Canal, the Raneegunge Canal, &c., were ready for execution when the famine of 1873-4 occurred, but nothing was done on them; and it is well that this was so, as both the projects above mentioned had been insufficiently considered and largely under-estimated.

BOMBAY.

Bombay.

Sir R. Temple mentions first among the essential precautions to prevent famine mortality the preparation beforehand of useful projects of public works to which able-bodied labour can be immediately drafted on the threatening of distress, and in reply to the question whether a scheme of projects prepared beforehand can be maintained, he says: Yes, certainly. This is one of the conclusions universally drawn from the famine of 1874 and 1877. There is now a diligent inquiry being made all over British India regarding projects of utility, with the object of having them ready beforehand. Their preparation is essential if the Government and its officers are to deal with a famine properly and effectually at the outset. If these projects exist, the relief system will go like clock-work from the very beginning, the people will be kept in hand, panic will be stopped, and money will be disbursed without waste. If these projects do not exist, then the most vigorous operations of relief must be lame and confused at the outset. Panics will become almost impossible of prevention. Some accidents to human life from starvation will be sure to occur; and even if by spasmodic energy some moderate success is attained, much money will be wasted. We had great trouble in Behar for want of such projects in 1874. In Bombay we were very fortunate in possessing a complete series of these projects, which had been previously prepared. We have never since ceased to prepare additional projects for eventual use. Something similar has, I understand, been done or is being done in the North-Western Provinces. In the Madras Presidency there were at the outset projects ready in some places, but not in others, and there also, I believe, that a general preparation of projects is going on.

It was fortunate, even providential, that the Government of Bombay possessed, almost quite ready and complete, prepared previously under orders of Colonel Fife, R.E., plans and estimates of many projects for irrigation, especially in the districts of Poona, Sholápur, and Satara. To several of these, accordingly, many thousands of relief labourers were drafted. Some idea of this large operation will be afforded by the following table:—

Name of District.	Name of Canal or Tank.	Highest Number of Relief Labourers employed on it.	Approximate Area of Tank in Acres.	Approximate Area under Command in Acres.	Length of Canal or Main Channels in Miles.	Expenditure during the Famine in Rupees.
Khandesh - - -	Mhaswa Tank - -	670	421	2,060	6	38,000
Ahmednagar - -	Ojhar Canal Extension -	3,500	—	17,528	9	31,000
Poona - - -	Mutha Canal - - -	18,155	3,681	105,812	70	2,51,000
	Nira Canal - - -	16,789	—	279,680	129	3,94,000
	Matoba Tank - -	6,420	477	12,412	20	1,73,000
	Shirsophal Tank - -	5,943	834	10,000	15	1,16,000
	Bhadalwádi Tank - -	986	336	2,900	15	7,000
Sholápur - -	Ashti Tank - - -	17,179	2,677	13,324	29	3,22,000
	Pangaon Tank - -	9,943	6,702	60,000	80	1,34,000
Satara - - -	Nehr Tank - - -	16,836	675	12,800	17	2,92,000
	Mhaswad Tank - -	15,651	4,014	90,000	31	4,06,000
	Pingli Tank - - -	10,374	349	4,100	11	2,76,000
Belgaum - - -	Gokak Canal - -	11,946	—	77,319	52	2,17,000
	Gaddikeri Tank - -	1,231	136	450	2	18,000
Dharwar - - -	Dambal Tank - - -	1,897	421	1,790	2	57,000
	Medleri Tank - -	1,129	169	1,916	10	26,000
	Hirekerur Tank - -	1,001	567	562	2	18,000
	Ránibennur Tank - -	908	268	174	2	24,000
	Total - -	—	21,727	692,827	502	28,00,000

Mr. Hughes.—In the year 1866 the Government of India called for the preparation of projects for irrigation works, and laid down that one of the main objects to be kept in view was to select those works first for execution which are calculated to prevent the occurrence or mitigate the severity of drought and famine.

Subsequently this Government ordered the assembling of district committees, composed of the Collector, the Executive Engineer, and senior Survey officers in each collectorate, to decide upon the sites to be surveyed. On the recommendations of these committees, investigations for several new schemes throughout the country were undertaken. Several projects were matured and submitted to Government, others were under survey or re-investigation, until in the beginning of 1873 orders were received from the Government of India prohibiting any large works other than those then in actual progress being undertaken, and directing that no new projects for large works were to be prepared or investigated until further experience had been gained of the results of irrigation works in the Deccan, and their remunerative character had been practically established.

In 1874 a review of the progress of irrigation schemes in relation to famine aspects by Colonel Rundall, R.E., was communicated to this Government, whose views on the subject were invited; but, under the stringent orders above referred to, this Government were precluded from making any proposals on the subject. The schemes investigated previous to 1873 were of the greatest possible value, during the pressure in 1876 and 1877, in affording useful and profitable employment, under strict professional supervision, to many thousands of relief labourers. Eighteen irrigation projects were undertaken in various parts

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Bombay.

of the country for relief purposes. Of these, 11 were large schemes which had been investigated previous to the order of the Government of India of 1873. The remainder were small works, principally improvements to existing tanks. The practical utility of large irrigation schemes in affording employment to relief labour was publicly acknowledged, first, by Sir Philip Wodehouse's Government (G. R. No. 426, C. W. 1,000, of 1877), and subsequently in the minute by his Excellency Sir Richard Temple on the famine of 1876 and 1877.

Madras.

MADRAS.

Lieut.-Colonel Mullins.—No schemes of works suitable for execution in the event of famine were drawn up in the Irrigation Branch of the Public Works Department, and no orders to prepare such schemes were issued. In 1866 instructions were given for the investigation of irrigation schemes to be carried out from loan funds, and several were matured and have been partially carried out. Parts of such schemes remained to be executed when the famine of 1876–78 commenced, but they were for the most part situated outside the tract of country affected by famine, *e.g.*, in the Godavari and Kistna Deltas, and the population needing relief was at a distance from them. In the Kistna Delta one work, the Commamur Canal, being on the edge of a tract of country which suffered and not very far from a part of the Kurnool district in which the distress was severe, was started as a relief work, and proved of considerable use.

Sir W. Robinson.—It may be assumed that, so far as any practical bearing of the question is concerned, the periodical recurrence of famines within the Tropics can neither be prevented, nor can their mortal course, I fear, be materially arrested. On their recurrence the specific problem of saving the lives of great sections of the population during the currency of the calamity arises, and the less we complicate it by generalisations, and valuable, yet not directly revelant, inquiries and issues, the better.

The first questions under this chapter relate to preparations for one form of relief of the famine-stricken; viz., works. Of course, this means of relief is of great and primary importance, and I am thoroughly in sympathy with it both as regards preparation and execution. But I confess that I think that, viewed by results of the past administration with its terrible mortality, as well as in the light of the pathology of famine as it affects a declining and atrophied population, it may be found expedient not to rely so exclusively in future on this severer form of relief for saving life in all stages of famine; and that schemes for village relief and other more suitable means of rescue may likewise have to be devised—more especially for the earlier stages of the famine warning. I certainly should advise it. There is much that requires nursing in a famine.

Lists of schemes and works required in each taluk, with plans and estimates, should be in existence in every district as part of the Public Works Department and Collector's pre-arranged disposition for the general improvement of the country; and special famine lists will practically be included in this list if it be kept up to date as respects works executed in the interim, and additions to be made as further requirements develop themselves. Works need not wait for a famine, nor need a famine, in its first stages at least, require special treatment, as respects large and costly works, so long as relief works are reasonably near the distressed population. However, the preparation of projects may well be urged at this time, and experience has shown that embarrassment arises from projects not being in a sufficiently advanced state for immediate execution when required by recent occurrences.

Mr. O'Shaughnessy.—There is no trace of instructions to prepare a scheme of famine relief-works having been received by the district engineer, Nellore, and there were no schemes prepared specially for famine relief in the Nellore district.

Mr. Traill.—Only one large project was prepared in this division, viz., the excavation of a channel, 9 miles in length, for connecting the Kandukur with the Pedda Thippa Samudram and Rungasamudram tanks. This project was examined by the Chief Engineer for Irrigation in November 1875, and he then decided that it ought to be condemned, on the ground that it would never prove remunerative to Government. Subsequently, during the famine, the permission of Government was obtained for the execution of the work; but the Collector objected to it on various grounds, and it was never taken up. The Kurli ghaut was another large work commenced in the previous famine of 1866. An estimate was prepared for completing it; and both previous to and during this famine it was pushed on with, and is now nearly complete.

Ch. IV. Qn. 2.

QUESTION 2.—DIFFICULTIES OF KEEPING THEM UP.

Do there appear to be any difficulties in the way of keeping up such schemes in a form which will be really useful in the future?

SUMMARY.

General opinion that there is no difficulty in keeping such schemes ready for use in time of famine.

Punjab.

PUNJAB.

General Maclagan.—There is no difficulty in keeping up schemes of famine-relief works in a form that would be useful in the future. But there are certain considerations bearing on the practical usefulness of such schemes which require to be adverted to.

Works proposed for employment of people suffering in times of scarcity must be of a certain kind, suited for the ready employment of untrained labour. Earthwork of a simple kind is the most generally suitable description of work; but other kinds of work, as road metalling, stone breaking, kankar digging, carriage of materials, may sometimes be made to furnish useful employment, if this can be done with the necessary facilities for concentration and supervision of the work.

CH. IV. QN. 2.

PUNJAB.

The list of works proposed for famine relief should include, if possible, large works. Small works, which need less time for examination and preparation, are more readily supplied. Small works, if really required, are more easily provided with funds and carried out in ordinary times.

Many or most large works which would furnish employment of this kind are incomplete without certain parts of the works, which are of kinds not suitable for famine relief.

A special scheme of famine relief work cannot be quite independent of other works and ordinary arrangements, so as to be dealt with altogether apart from them, and apart from the consideration of expenditure of ordinary Public Works Funds.

In the Punjab no such scheme is kept up, separate from the general list of approved and sanctioned works, which are waiting for the means of being carried out. Only it should be seen from time to time, as one or other of these sanctioned works is executed and struck out of the list, that the list continues to include works which are in whole or in part suitable for famine relief. It is not to be expected that when any work on the list is much wanted without reference to famine requirements and the money is provided, it should be set aside that it may be kept till a time of famine comes. There must be a certain amount of trust that other suitable works will be found. All works on this list are approved, estimated, and sanctioned, ready to be selected and given out when needed.

Large canals and tanks for water supply or irrigation supply the most entirely suitable and certain means of employment of unskilled labour. Roads and railroads largely embanked or deeply cut provide equally good work of similar kind, but where they run nearly on the ground level, and furnish little work, the people are dispersed over a great length of ground, or have to be frequently moved, and supervision becomes more difficult.

At the present time there are on the Punjab list (apart from irrigation works, dealt with separately, and District works, which are for the most part small,) 95 sanctioned major works (costing upwards of Rs. 2,500 each) and 51 minor, which wait for funds to execute them. Of these 146 sanctioned works 85 major and 49 minor works are buildings and bridges: 10 major and 2 minor are roads and works of miscellaneous public improvement. These last are the works which would best furnish, if required, relief employment. Most of the District works and some Municipal are of the same class. And besides these new works there are the regular repairs of roads, separately sanctioned, and not included in the list of works; on which road repairs, provincial and District together, the estimated expenditure in the present year is upwards of 9 lakhs. Buildings and bridges, though not of the class of works which best furnish employment of the kind required, are not to be altogether left out of consideration. At Lahore, in 1868, the preparation of a large site for a building provided good work for the suffering people, and the earth-work approaches to a bridge at Rawalpindi in the present year.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Plowden.—There appear to me to be no difficulties whatever in the way of keeping up the schemes referred to in this question in a form really useful for the future.

All that is requisite is, that the plan and estimate for each work should be numbered; that a list of these, an index, in fact, to the works for each district, should be maintained? and that, as these works are taken up as ordinary works and completed, these numbers should be removed from the list by a note to this effect, and a plan and estimate for a new work in substitution of this should be added to the list.

The initiating of a project for a new work would rest with the district and departmental authority, and the project would have to be sent up to Government for sanction in the manner prescribed for ordinary works.

Mr. Lang.—Yes, the risk of waste by reason of there being no regularly prepared schemes ready for relief works is very great. There is, moreover, danger of paupers being left without proper relief during the preparation of projects.

There is not the least difficulty that I can see in utilising the services of the Department Public Works in the preparation of suitable schemes.

The district engineer is a very lightly-worked officer, with plenty of time on his hands, in most districts; and he might well be set to do this work.

The Executive Engineer and district engineer should be required to study the requirements of the division and districts in their charge, and take steps to have the necessary projects prepared. I would not relieve the district officer of the responsibility of providing for the wants of his district, but there is no reason for relieving the Public Works Department of concurrent responsibility. The district engineer, who constantly traverses the district, should be able to decide from a professional point of view the works that are most needed and the best way of carrying them out, and should communicate his views to the Collector and the Executive Engineer.

These projects should be considered year by year, without reference to the budget; they should be thoroughly worked out, plans and estimates prepared and passed, and put away in a pigeon-hole ready for use when wanted.

Some of these projects would be for works urgently needed and financially sound, fit to enter in the budget at any time; others of more doubtful financial or economic value, and only to be taken in hand in case of necessity.

Anyhow, they all ought to be lying ready for use at a moment's notice; and I am of opinion that most district engineers have ample time in their hands for the preparation of the projects, in addition to their ordinary current duties, in years of prosperity.

It is on the Department of Public Works that I would throw the responsibility of initiating as well as preparing these projects, and make that department distinctly responsible for bringing forward suitable works whenever the necessity arises; that agency is, in my opinion, amply sufficient for the purpose.

Colonel Brownlow.—The number of large projects of a really useful character, suited to purposes of famine relief, being necessarily limited, the difficulty of keeping a stock of them in hand will, of course, increase in proportion to the number already executed; but there can be no doubt of the advantage of insisting on the Chief Engineers of Local Governments looking ahead and carefully considering the designs and estimates of such works, having them all ready for execution in the event of famine befalling.

BENGAL.

BENGAL.

Colonel Haig.—Supposing such schemes to have been prepared, there seems to be no difficulty in the way of keeping them up in a form suitable for immediate use. They would have to be worked out in full detail; and after going through the regular course and final sanction by the local Government or the Government of India, the papers, plans, and estimates would be preserved in duplicate—one copy in the central office, and one in the divisional—against the advent of the next famine. But all this would involve expense; the getting up of large projects in the degree of detail now required is a costly process. Land plans, too, would have to be made in full detail and be preserved. Changes, however, in holdings and fields might in the course of a few years render these of not much value, and in fact it might be found, when famine came, that a whole scheme which had been kept in readiness for such a contingency had in the meantime been superseded by others which had been carried out in the ordinary course; so that the whole expenditure in getting up the scheme would be simply money thrown away.

Colonel Cadell.—There is no real difficulty in the way of keeping up such schemes, which should be prepared in advance, of the immediate and most urgent requirements of the districts.

BOMBAY.

BOMBAY.

Mr. Hart.—The schemes being prepared, examined, and recorded with provisional sanction, no difficulty can occur in having them ready for use on future occasions of famine-relief work being required.

General Wilkins.—There can be no difficulty in the way of keeping up schemes for famine works.

MADRAS.

MADRAS.

Mr. Thomas.—*A special Staff of Engineers required for preparing Projects.*—As regards irrigation, I think there is no truth in the statement put forth in some quarters that it has already proceeded as far as it can. During the former famine (1866), the selfsame statement was made by the head of the Irrigation Department of this Presidency, with special reference to the then famine-stricken district of Salem. I was then able to contradict this statement by pointing the then famine officer to a project of my own which was expected to store water over an area of about 80 square miles (G.O., 21st January 1865, No. 93). It was thereon examined, of course too late for that famine, and, in consequence of the nature of the examination, condemned. Now another famine has come upon us, and again I pointed to this project, persisting that I was right, and again it was examined, and it was found I was so (G.O., 9th April 1878, No. 883). But it was, so found, too late for any practical use in this famine, because the work was obviously too vast to commence at the tail of the famine, and without fuller detail of plan and estimate.

Minor irrigation works which I projected at the same time, some 13 years ago, when I was subcollector in that district, came in very usefully for execution in the present famine, and they will be lasting advantages to the country.

What is the moral of this? We want projects to hand, and projects to hand we shall not have if we do not make provision for getting them.

The existing staff of engineers is not enough for the close examination of irrigational projects. Past experience has proved this beyond a doubt. It is time we accepted it and acted on the known fact. The existing staff of engineers is hardly able to cope with the current work of maintenance of ordinary irrigation works, roads, and buildings. For special projects we should have a special staff, whose sole business should be to examine the whole Presidency, not from a local or district, but from a general or Presidency, standpoint; and deciding on what projects will be best for the country generally, will best advance it, as a whole, towards perfection in irrigation, steadily work out those projects, and, as each is perfected, with estimates, plans, and specifications complete, lay it on a shelf where it can be found, and will be ready for immediate execution with no further examination than that of the local changes, if any have been made by time and modification of rates.

Colonel Mullins.—There is no practical difficulty in the way of providing schemes of irrigation for famine-relief purposes, provided the necessary establishment of officers and surveyors be made available for investigating and preparing the projects. So long as the regular Public Works Establishments are inadequate to the efficient performance of current work and duties, of course no investigations apart from the more pressing requirements of these can be undertaken.

Major Montgomerie.—There can be no practical difficulty in the way of providing schemes of irrigation for famine-relief purposes if the necessary establishment is available for the purpose; but with the existing strength of the Public Works Department in Madras, this will not be the case until the Irrigation Branch is separated from the General Branch. In the Madras Presidency, owing to the varied nature of the work to be performed by the executive of the Public Works Department, an entire separation, however desirable, will not be practicable; but a separation of the duty of projecting and designing from that of the execution of the works is absolutely necessary, not only for the preparation of schemes of irrigation for famine-relief purposes, but for the economical working of the irrigation branch, so long as it is required to design new works or suggest extensions and improvements to existing work; in other words, the *personnel* of the Chief Engineer for Irrigation must be strengthened by a fixed establishment of executives, assistants, and subordinates, who probably, on promotion, would resume executive duties; their salaries while attached to the office of the Chief Engineer for Irrigation would, of course, be charged to the projects or schemes on which they were employed, and not to the general establishment of the department.

Many members of the department, although admirable organisers of labour and thoroughly practical men, are not altogether fitted to perform the higher duties of the profession; and it is worse than absurd to require such men to design and project schemes of irrigation merely because they happen to be in executive charge of a division in which there is a likely project. Besides this, it is not possible for any executive, however intelligent and energetic, to do justice to his own legitimate duties, and at the same time to investigate an elaborate scheme of irrigation.

Ch. IV. Qn.

Madras.

In engineering, as in all other occupations, a proper division of labour is the only rational method of making progress.

Mr. Traill.—The formation of the country is one great drawback to the preparation of any large schemes or projects which would be useful in future famines. The general elevation of the division above the sea averages about 2,000 feet; the country is very hilly and studded with petty tanks, and there are no large rivers from which irrigation canals could be led. The division is intersected by roads, already so numerous that they cannot be nearly all maintained, and the construction of railways is out of the question. The division and taluks are large, and, as a rule, work is so heavy on all, that, should any new and large project be devised, special establishment would be required for its investigation.

QUESTION 3.—CLASS OF WORKS TO BE INCLUDED.

Ch. IV. Qn.

What classes of works would be included in them? Would the works differ in character from the ordinary works of utility brought forward for execution from time to time? And, if so, how? Give a practical example of works now considered suitable to be taken up as elements of such a scheme in two or three districts, if possible.

SUMMARY.

The works generally suggested, viz., roads, canals, tanks, earthwork for railways, are of the kind ordinarily carried out from time to time, as means are available, but local conditions sometimes suggest works of a special character, such as the deepening of a harbour, the strengthening of river banks.

PUNJAB.

Punjab.

General Maclagan.—The answer to the first three questions in this para. is given in p. 364. The proposals for the works of which the sanctions are recorded on the list referred to are approved by the Government before estimates are prepared. All are thus works of admitted importance or usefulness, which would be carried out in ordinary course if means were available, and which have had to be deferred in favour of works more necessary.

Among major works considered suitable for giving employment of the kind under consideration, may be mentioned:

Metalling and earth-work of the Delhi and Sirsa road in the Rohtak and Hessar Districts.

Sanauli and Sewa road in the Karnál District.

Phagwára and Bunga road in the Jullundur District.

Improvement of Pathánkot and Dunera road in the Gurdáspur District.

Improvement and metalling of road from Chichá-watni railway station to Dera Ismail Khan, in the Jhang and Dera Ismail Khan Districts.

Earth-work of road from Dera Ismail Khan to Dera Ghazi Khan in these two Districts.

Also making and raising minor roads in several Districts, and the general road repairs above mentioned.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Colonel Brownlow.—Schemes for irrigation, and for providing means of communication either by road, rail, or canal, seem to be best suited for purposes of famine relief. Canal or reservoir projects provide the largest proportion of work best suited to employment of famine labour. Railway schemes are open to the objection of involving a large proportion of expenditure in Europe, burdensome to the finances and quite useless for relief of distress in India; and roads offer, in most cases, too small a section, and too extended a line of work, to admit of economical management and supervision. There would, as a rule, be one main difference between such famine-relief works and productive public works, that the former, though hardly affording promise of direct returns, sufficient to admit of their being classed as productive works, and brought forward for execution in ordinary times, would yet offer a prospect of indirect advantages so large as to warrant their execution for relief of the famine-stricken poor. Many of the reservoir schemes in Bombay, the Betwa Canal in Bunkelkhund, and the proposed navigation channel from Cawnpore to Allahabad, are examples of such works.

Captain Pitcher.—The district engineer must perforce, even within the ordinary working hours, have considerable leisure, which could not be better employed than in surveying and levelling systematically until every portion of the district had been examined with a view to possible improvement. I venture to assert that there is not a district of Oudh in which ample room cannot be found for such improvements as the levelling and bridging of country cart tracks connecting different district markets with each other and with the main lines of traffic; the bunding of nálas, so as to form reservoirs; the embanking of roads running through low lands and otherwise impassable in the rains; cutting waste-water channels from swamps and jhíls, and thereby reclaiming good land for cultivation, &c., &c. Economical and durable culverts can be built from bricks taken from the ruins of old forts, numbers of which are to be found scattered over Oudh; and their excavation would in some cases well repay the labour as a famine work.

So long as there remains any chance whatever of rain falling, which, if the cultivators were close to their fields, could by them be turned to advantage, the advisability of providing work for distressed people in contiguity to their homes admits of no discussion. Tanks and bunds are the most suitable works under such circumstances.

The arguments against providing work for the people near their homes are the difficulty of supervision when works are numerous, small, and scattered, the difficulty of payment, and the unremunerative character generally of such works.

IV. Qn. 3.

NORTH-
ESTERN
OVINCES.

As regards the unremunerative character of tanks, much obloquy has been cast on tank-digging, owing to the fact that several of the tanks dug in former times as relief-works have never yet held water, notably in the Cawnpore district. I cannot but think that this has been due solely to some European officer fixing on the site of such a tank according to his own judgment, and regardless of the opinion of the neighbouring villages. Village people have in their quiet way a great deal of knowledge in such matters, amounting to instinct; and I have never yet seen a zemindari tank which had been dug in the wrong place for holding water. A good tank is an immense boon to a village, whether as a source for irrigation or as a public convenience for watering cattle and supplying household wants.

Apart from this, there are two items of revenue pertaining to tanks—namely, that derived from the sale of fish and that from the lease of the water for water-nut (singhára) plantations, while whenever a tank in which water-nuts have been grown dries up the bed affords a rich vegetable manure.

The zemindars of any village in which Government might determine on excavating a tank would not only give the land free, but would willingly agree to Government retaining all profits accruing from the sale of fish and singhára until the original outlay had been recovered, or to those profits being assessed as land revenue, half to be retained by the zemindar and the other half to be collected by Government along with the jama. Even if looked on simply as interest on the capital sunk, these profits would yield a large return.

The Chinhat tank was constructed by one of the Oudh kings. The zemindars take as much water as they require for irrigation, as much manure as they can carry away from the bed, and cultivate the bed, as it dries, down to the water's edge; but Government takes the fish and singhára revenue. The leases for singhára alone were taken for 1877 for Rs. 500 or so, while the fish are known to have brought in in former years as much as Rs. 6 and 700. For April and May 1877 Rs. 200 were tendered for the fishing in those months alone, and for the six months previous the contractor sublet the fishing for some Rs. 350.

In 1870 I cut a channel over a mile long, at a cost of some Rs. 250 (subscribed by neighbouring villages), to carry off flood water from the Karaila jhíl into the Lúni river. Fish came up from the Gumti by the Lúni into the jhíl; and I was assured that the fishing which had been sold in the year previous to the channel being cut for Rs. 80 sold the next year for Rs. 200, besides which nine stations for irrigation were established on the banks of the channel, and lands which had been almost barren before were put under poppy cultivation. The channel was only opened as a temporary relief, and soon silted up, it being no one's business on my leaving the district work to look after it, while the villagers could not agree about sharing the expense.

Calculating profits at 10 per cent., the construction of the Chinhat tank must have cost Rs. 10,000, which is, I should say, considerably above what it actually cost, as it is formed in a natural depression; and below it in the direction of its waste-water stream is another depression, which could be turned into a tank of similar capacity by an expenditure of not more than Rs. 5,000. I have in my possession a petition from the zemindars in whose lands this latter tank would principally lie, asking that it might be made for them, and consenting to Government repaying itself from the fish and singhára revenue.

It may be objected that it would be long before the tanks got stocked with fish. As a matter of fact, however, whether the spawn comes with the rains, or the parent fish from the subsoil water, it is impossible to say, but come they do, and many zemindari tanks which dry up regularly as the hot season comes round afford an annual take of fish to their owners. Whenever the Chinhat tank dries up, which it occasionally does, the people dig up the bed and find fish in the subsoil water level, to which three species appear to resort on drought coming on. In 1877 Rs. 200 were, as I have already mentioned, offered for leave to take fish in April and May, though the tank was almost dry; and it was stated that on the last occasion of the tank drying the contractor had made a large sum by thus digging. The subsoil water level however, fell so low in 1877 that the people digging were not equally successful.

As to supervision, tanks and bunds are to be found in every direction constructedy the zemindars in a rude but substantial fashion, and far cheaper than would be the case were professional agency employed.

As to the payment of large bodies of men, the zemindars are in constant practice during agricultural operations, and natives much prefer payment by "chittas," as practised by native employers of labour, to any other method.

It is notorious that the cost of relief-works under the Department Public Works, including supervision, is, as a rule, several times that of works constructed by contract at other times; and I believe that the ordinary cost may, on an average, be safely multiplied by five.

I should leave it to the villagers themselves to select a site, and I should get a rough estimate of the number of people likely to resort to the work and for how long a period.

Call the period three months and the probable number 3,000, and, excluding the cost of Department Public Works supervision, take the multiple at three.

I would then design a tank or tanks of such cubic capacity as could be in ordinary seasons excavated by 1,000 strong and skilled labourers in three months for (say) Rs. 6,000. I would then point out to the zemindar that to get the work done three at least of these feeble folk must be employed in the place of one strong man, and promise that, if the work were completed within the time, three times the ordinary sum would be paid, with a further premium if completed within less than thsee months, warning him at the same time that if he employed strong men, to the exclusion of the weak, the ordinary rate would alone be paid. Several of such works opened out simultaneously in a tahsíl, and frequently visited, would ensure labour near their homes for large numbers of people, and be of permanent benefit. There would probably be a mixture of strong men as well as weak; but the strong, being in a position to earn wages, would support at their own homes many of those aged and infirm people who, when their supporters are drawn away to distant works, are forced either to resort to the poorhouses or else die at home. Channels might be dug under this system to carry the flood waters of rivers into reservoirs in waterless tracts. If, at the same time, cloth were bought from the Kuláhás and Joeris, as recommended in Chapter II., and leather work from chamárs, the people would be kept in their villages.

I believe that in some districts it has been found difficult to provide sufficient work for people in time of scarcity. Advantage might be taken of such times to fill up the stagnant ponds and the excavations to be found in every village, and from which the earth for building the village was originally taken. This would be a great sanitary improvement. The earth could be taken from a new tank, dug to the north or south of the village, and if possible below it, so as to receive the drainage.

Mr. Macdonald.—Railways and roads, metalled and unmetalled. As regards the Tarai, the extension of the railway to the foot of the hills from Muadabad and Bareilly may be instanced.

Mr. Barstow.—Earthwork in connection with new lines of communication, railway embankments, and canals, improving existing lines of communication, and collecting metal for first-class roads.

Ch. IV. Qn

North-Western Provinces

They would only differ from ordinary works of utility, inasmuch as the portions requiring skilled labour would be in abeyance; thus, in the case of a road, the earthwork required for the embankment might be carried out, and the bridges and culverts allowed to stand over.

As an illustration, the new proposed Nagra, Rasra, and Korantadih road may be given, a portion of which would lie in the Gházipur and a portion in the Azamgarh district. The sanction of the local government under section 17, Act X. of 1870, would be necessary to enable the Public Works Department to enter upon the land, and this could not be done until 15 days from the publication of the notice required by section 9.

Practically, no one would offer any opposition in rural districts to their land being entered upon previous to the expiration of the notice in such an emergent case as famine.

Major Liston.—There are two classes of works which in this district are suitable for execution in the event of famine. In the first may be entered what in this question are called ordinary works of utility; *i.e.*, road making and road improving; and in the second, works differing in character from road work, that is, tank embankments.

There is such a large proportion of red soil in this district that road making or road improving is a work that can be carried on by unskilled labourers with profit to Government.

Tank embankment is a work which I should like to see commenced without any famine as an excuse, for no better precaution against famine could be taken as regards the Lalitpur district than building tank-bunds. In the famine of 1868-69 the villages with tanks were comparatively well off: sattia rice was grown round the edges of the tank, and no cattle died of thirst; and again this year, a year of short rain, wherever a tank exists the wells are well filled.

No work is easier looked after or more fitted for unskilled labour than the earthwork of a tank embankment.

In 1868-69 the mistake made, in my opinion, was that embankments were thrown across streams (nálas), which in the rains were raging torrents with strength to sweep away all but the strongest masonry; the consequence naturally being that the earthwork, unprotected by masonry or by rough stone facing, as embankments were protected in the time of the Gonds, gave way before the first work of the stream.

Besides new embankments, I would set the people to repair old existing bunds in villages wherever it were possible to give supervision. This is a work which, though it would not at once show a profit in rupees, annas, and pies, would profit Government by enlarging the cultivated area, and bring in more cultivators, all of which would tell at the next settlement.

Mr. Cornwall.—The works selected for execution in times of famine have usually been those requiring a large amount of earthwork, such as raising roads, making approaches to bridges, and such like. All works of this kind must be such as will employ unskilled labourers to a large extent. Those sanctioned for this district in the event of last year's distress increasing were the improvement of the Mogal road from the Fatehpur to the Etáwah district, and the improvement of the road from Sikandra through Mangalpur, Jhinjak station, East Indian Railway, Rasúlabad, and Kukwan to the Grand Trunk Road at Bilhaur, where it is in contemplation to have a station on the Cawnpore-Farukhabad Light Railway. These works were selected at the time on account of the parpagans through which they pass being more liable to distress; but, in addition to them, there is at present no lack of similar works.

Mr. Watts.—I consider that the classes of works that should be included in any such schemes are:—

1. Roads.
2. Cutting and embanking for lines of railway.
3. Irrigation projects.

These would differ in character from the ordinary works of utility brought forward from time to time in that they would be on a much larger scale, being calculated and provided to give relief to a great number of people, paid most frequently at rates much higher than those given for ordinary labour.

Good illustrations, among the works now considered suitable to be taken up, are:—

(*a.*) The work of the Cawnpore and Farukhabad Light Railway, running through the Cawnpore and Farukhabad districts, and hereafter to be protracted through the Etah into the Aligarh district.

(*b.*) The rectification and alignment of the Káli nadi, in the districts of Etah, Mainpuri, and Farukhabad.

Mr. Sells.—I presume that it is intended that only large works should find place in the scheme alluded to in Question I., and the only two such works that I can suggest for this district are—(1), a railroad to Bijnor; (2), a railroad to Roorkee; and (3), the adding a second line of rail to the Panjáb and Delhi line throughout its course. There are some drainage projects which have been under contemplation for some years past, and the desirability of which, for all reasons, must be acknowledged; notably—

The Shámla nála project;
The Fatehpur Aldi project.

The raising of the main line of Kucha road, in the district, is also a work admirably adapted for relief purposes; and I have already proposed this, and it is a work of great utility. These latter works, however, would afford but little relief in a time of very severe scarcity, much less of real general famine. Nor am I at the present time prepared to suggest any other large works than the two lines of railway before noted. But in any such scheme it would be advisable to avoid, as far as possible, works requiring—at any rate, in the initiation—a preponderance of skilled labour.

The works should be such as to afford easy labour for men, women, and children; by easy, I mean labour such as requires no professional or handicraft skill. Earthwork is, of all classes of works, unquestionably the best suited for relief purposes. The excavation of canals and drainage lines, and the raising of roads, therefore, furnish the best kind of labour.

BENGAL.

Bengal

Col. Haig.—The class of works suitable for such schemes would be the ordinary works of utility, principally earthworks. There are two or three small irrigation projects on the Bagmutty and other rivers in Northern Behar, which have been rejected by the Government of India as unsuitable for execution in ordinary times, which might do for this purpose. There is also the extension of the Main Western Canal on the Sone, which was actually begun as a relief-work in 1874.

Col. Cadell.—The classes of works which would be included in the schemes are road, embankment, drainage works, and tanks, also railways and irrigation works in exceptional cases. They would not differ in character from ordinary works of utility. The following are examples of works now considered suitable as elements of such a scheme in three districts; viz.:—

(*a.*) Moorshedabad. A railway from Bhugwangola through Kishnagurh to Ranaghat on the Eastern Bengal Railway, also from Ranaghat to Jessore.

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(*b.*) Nuddea. Embankment from Jeagunge to Bhugwangola.

(*c.*) Jessore. Improvement of the drainage of the town of Jessore, and of the river Bhyrub, which flows past it.

The above would be provincial schemes; other schemes would be local, and would be worked out by the local authorities. (Road-Cess.)

Bombay.

BOMBAY.

Mr. Hart.—Irrigational and water-supply works, in the shape of canals, tanks, and embankments, are the most suitable. The works might be held to differ from those sanctioned ordinarily, inasmuch as the returns expected might be less, and indeed in certain cases they might be nil, being merely useful works, expenditure on which in payment for work done would be preferable to gratuitous relief or the execution of less useful works for future famine protection.

I should give as a practical example of elements desirable still to be further investigated and elaborated—

The series of large storage tank sites under consideration in Kaladgi.

The Malsiras Canal from the Nira right bank.

The Sina Canal in Ahmednagar and Sholapur.

The Godavery Canal in Nasik.

Major-General Wilkins, R.E.—Such works would not differ in character from ordinary works of utility which are brought forward for execution from time to time; but hitherto it has not been the policy of Government to undertake as famine work any other class of work than earth-work. Now very few public works are comprised of earth-works only, although, buildings excepted, most public works include earth-works. Canals, tanks, and roads are those public works in which earth-works comprise the bulk of the work; these works, therefore, are those best adapted for famine works. Nearly all public works have works other than earth-works, and it would not be advisable to prepare projects so far as earth-works only are concerned, and to leave out other works necessary to the completeness of such schemes.

In my opinion, if it were thought desirable that schemes for works should be kept ready for execution in times of famine, such schemes should be made complete in every respect, and include all works necessary for their completeness.

The prevailing opinion that masonry works are unsuited for the employment of the people, because skill is needed in the construction of such works and the cost of masonry works exceeds that of earth-work by reason of the materials used, is not, in my view, a sound one. I will take, for an example, a large public work now under construction, the wheeled carriage road at the Amba ghat, which is to connect Kolhapur in the Deccan with Ratnagiri in the Konkan. This work, the construction of a mountain road eight miles in length, will cost Rupees 2,80,000, the whole of which amount will be expended on two items of work, namely—earth-works, Rs. 1,80,000; masonry works, Rs. 1,00,000. The cost of the masonry works, therefore, is, to the cost of the earth-works, as 5 to 9.

Now, supposing this work to be started as a famine work, and the masonry work not permitted to be touched, at a first view, it might be supposed that out of 14 parts nine would be available for famine-work labourers.

A closer examination, however, would reveal that the setting aside of the masonry five parts would entail a considerable diminution of the nine parts earth-works. The five parts bridges, culverts, and drains all require the earth-works of the roadway to be carried up to the formation level, or grade, of the finished road passing over those constructions.

Without the masonry works a great portion of the earth-works must be left unfinished; so that it may be said only a portion of the estimate of the earth-works of this large work is available as a relief-work; the other portion, by which alone the first portion of the earth-works would come into any use whatever, must lie by to some future day when Provincial funds may be available for its execution with the masonry works. If undertaken the following year, how will the revenue of the country benefit by the postponement of the expenditure? If set aside for years, each yearly rainfall will resolve the banks and cuttings into their original configuration, and when at last the work is undertaken in consideration of the money already expended it will be found that the cost of completing it does not fall far short of the original estimate.

Masonry works comprise two items,—"labour" and "materials." Taking, for instance, what is called "rubble masonry work," and examining into a detail of the items which collectively unite to form that description of work, it will be found that where 100 cubic feet of rubble masonry costs, at an ordinary rate, Rupees 24, this amount is distributed as follows:—

Labour - - -	Rs. 11
Materials - -	„ 13
	Rs. 24

So that, with 5 to 9, the proportion of masonry works to earth-works in the estimate for the Amba ghat road, the 5 parts are divisible into 24 parts, of which 11 parts represent labour and 13 parts materials.

Reverting then to the Amba ghat estimate of Rupees 2,80,000, no less than Rupees 2,25,834 are for expenditure on labour, and Rupees 54,166 only for expenditure on materials.

It will be found, on further examination, that the amount for expenditure on masonry materials is itself in reality only labour.

The Rupees 13, the price of materials for 100 cubic feet of masonry, is for the purchase or cost of

	Rs.	a.
Stone - - -	7	4
Slacked lime - -	4	8
Sand - - -	0	8
Sundries - - -	0	12
	Rs. 13	0

These items all represent labour: the stone to be quarried and prepared; the limestone to be collected; the sand to be excavated. The charcoal required for burning the limestone represents labour; the powder for blasting, country-made, represents local labour; and the only items which can be regarded as foreign to local labour are the purchase of steel for tools, and possibly the Government fees for the forest wood of which the charcoal is made.

Hence it is no exaggeration to say that the Amba ghat mountain road work, as a complete project, with its earth-works and its masonry works, would form an excellent relief-work in its entirety. To adopt projects of this kind as relief-works, and to set aside the masonry works as unsuitable for execution during times of famine, is only to emasculate schemes for no sufficient purpose. Therefore I contend that the question put in para. 3 of Chapter IV. of these papers, "Would the works differ in character from the ordinary works of utility brought forward for execution "from time to time?" should be replied to in the negative. Setting aside the construction of buildings for occupation, which require a large proportion of skilled labour, all engineering works of general utility are suitable as relief-works.

If Government would sanction road projects in their entirety, setting aside, as indeed is done in ordinary times, the larger bridges, then I am satisfied that the results obtained at the close of a famine would be materially enhanced in value. The small drains and culverts would be taken in hand with the earth-works, which would be carried up to them, and enable the road banks to be brought to proper grades, to be finished off the next season.

The most valuable piece of road-work carried out by famine labourers in the Southern Division is a length of three miles of ghat road on the Belgaum and Kaladgi road. General Kennedy approved of my proposal to carry out the masonry works on the Hunmunhutti ghat. The old ghat road had gradients as steep as 1 in 10, and cart loads on the road had to be regulated by the tractive energy of a pair of bullocks working on such grades. An entirely new ghat road was made by famine labour in 1877, including the necessary masonry culverts and drains.

George Kennedy also approved of masonry drainage works in the fort of Bijapur, designed to benefit the new station to be established at that beautiful city. Unfortunately, the executive engineers who had charge of the district works acted on general orders to relegate the people to tank work, and thus the drainage works fell through, barely touched. It was a great opportunity lost of turning famine labour to excellent account.

The completion of the road between Belgaum and Kaladgi, as a properly embanked, bridged, and drained road, would form a good scheme; the construction of a bridged and drained road from Gotoor, on the mail road to Gokak, would be a good scheme; and these could be easily added to if desired.

One project completed,—and projects sometimes take years,—they should proceed with another, and so on, till the country is all gone over; and several parties should be working at once with one controlling head, who should be the most practical widest-viewed engineer the Presidency can find.

I made exactly these proposals to the then Famine Commissioner, Mr. Ellis, 12 years ago. If they had been accepted and worked on then, we should not have been in the straits we have been in the present famine, and should have spent the money we have spent much more to the lasting benefit of the country.

Colonel Anderson.—Railways and works of irrigation. They would not differ in character from ordinary works. The Gadak, Hubli, and Karwar Railway, in the Dharwar collectorate. A branch railway from the G.I.P., breaking off from it at some point near Sholapur, and proceeding south through or near Bijapur and Bagalkot to Gadak in Dharwar. A branch from the G.I.P. from Barsi Road station to Barsi. Repairs of existing tanks in the Dharwar collectorate, of which there are many improvable.

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Mr. Thomas.—Irrigation—Location of Works.—I wish to lay stress on the position I take that these projects should be initiated and examined, not at all with reference to the possible necessity of finding labour in certain localities near the homes of the possibly starving, but solely with a view to bring the country, as a whole, into a famine-prevented condition.

The projects should be large, as large as possible, not small ones spread about the country to give labour. Small ones cannot withstand long droughts; witness how small tanks ran dry all over the country. Large works are comparatively cheaper to construct than are small ones, and therefore yield a better percentage on outlay; the thorough supervision of labour on large works is easier than on a multitude of minor works; large works alone have any pretension to be considered famine-preventive works.

Out of the famine-preventive license tax which we have recently imposed certain of these famine-preventive works should be taken up in years of plenty, so as to have them completed beforehand and preventing famine by their produce. Others can be kept for work in famine time. But the latter should be the secondary object, for famine will not come where it has been prevented. None came in highly irrigated Tanjore, which was consequently the granary of the South, pouring out its extra produce by cart and rail faster than the rail could carry it away.

But first in the list of projects should stand such as have for their object the perfection and stability of existing systems of irrigation; afterwards should come new projects.

In the first category stands, amongst others, the Cauvery Delta. On this subject I quote what I have already written elsewhere:

"It will be seen from my letter, No. 4,190, dated 21st instant, that in the earlier part of this season this district suffered severely from disastrous floods in the Cauvery, which caused breaches and tore away soil and seed-beds, and caused the loss also of the proper season, so that the cultivators were heavy losers from the sudden over-supply of water. Now, later on in the same season, they are still worse losers from widely withering crops. If the excess waters of the earlier season—waters that could not even get to the sea in their violent haste—could have been stored up and given us now, both evils would have been averted, and all the best lands of this well rail-tapped granary of the South would have borne full crops for the benefit of the famine-stricken districts around.

"2. This can easily be done at a site which I can point out; and this seems an opportune time for the Government to take up a large famine-relief work which shall, at the same time, be also a famine-preventive work and a flood-preventive work for a district in which the lands are amongst the most valuable in the Presidency.

"3. The site is in about latitude 12·9 by longitude 77·48. I could draw it out more or less approximately from the map, if desired, or I could, by a week's absence from my district, personally point it out exactly to any engineer officer; and this latter plan would, perhaps, be most satisfactory. I came on it when I was sub-collector of Salem.

"4. As no levels were taken, I can only gauge roughly, from the eye and the memory of some 10 or 12 years ago, that it would submerge about 100 square miles, may be more.

"5. The land to be submerged was, as far as I saw it, poor and uncultivated.

"6. The site is all natural basin, hill-locked on a sides but the one draining into the Cauvery. That side I would dam across, and provide with a sluice for returning the water to the Cauvery when it was wanted.

"7. The Cauvery there falls rapidly through rocky country, so that no expensive anicut would be wanted, and but a very short length of channel would suffice to attain sufficient elevation for filling the reservoir to almost any desired depth, say even 100 or 200 feet, if really necessary.

"8. I would so locate the channel that only when the river is above a desired flood level would it relieve the river by drawing off the surplus, and, without returning, cease to draw off as soon as the river fell below that flood level.

"9. It would be easy to arrange that the channel should also spontaneously cease to receive as soon as the reservoir was full, so that no expensive masonry

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calingulah would be necessary for surplusage, the supply channel itself becoming the surplusage.

"10. It would also be easy to arrange that the vast embankment should be made by the silting process, for there is ample command both of hill soil and of a constant stream of water from the Cauvery.

"11. I think I could point out another like site near it, perhaps two; but of that I am not quite so confident, for it is now many years since I was there.

"12. In this connection I might also mention the pair of monster reservoirs near Kistnagherry which I proposed when I was sub-collector of Salem, and which would also be famine-preventive works, and were on that account surveyed at the instigation of the Honourable R. S. Ellis, C.B., then a Special Commissioner, and discussing famine-preventive measures. The matter will be traceable by a reference to Proceedings of Government, 21st January 1865, No. 197-93."

The objection brought against reservoirs that so much is lost by evaporation is, to my mind, no objection at all. The water so evaporated is not lost; it is utilised in the air in showers and dew to the advantage of the very much wider area of dry land. On the dry land we must mainly depend for the feeding of the masses; for it is, and ever must be, by far the wider area. We owe it to the dry or unirrigated land to restore its climatic position as much as possible by evaporation from reservoirs and by forestry. We owe it to the dry lands, by forestry and reservoirs, to so spread soil-retained moisture over the country as to make wells a possibility. The well irrigation of Coimbatore was invaluable in the famine. It should be more widely spread over the country. It cannot be without reservoirs and forests; for, without these aids to the retention of moisture, the water seeks the sea, and the wells run dry.

In advertence to the point on which I have insisted that projects should lie where they are wanted for the perfection of the country, and not with reference to the provision of labour, I am not unaware of the arguments for keeping labour near its home, so that it may speedily return to agriculture in case of rain, &c., &c., &c.; still I think the maximum of good to the country is gained by a position such as I shall instance, and I doubt not many other like ones, though slightly varying, may be found elsewhere.

The Pattukotai taluk of the Tanjore district is a dry one. It was visited with such severe want that, but for free emigration to adjacent Ceylon, it would have been badly famine-stricken. There are several, I think from memory seven, large rivers in it which run to waste in the sea every year. If these were all thoroughly examined by the special staff of projecting engineers proposed, they would give the means of turning this poverty-stricken dry taluk into an irrigated garden.

I think there is no system of irrigation so cheap and good generally as that which diverts short-lived rivers into trustworthy reservoirs.

The projects being ready, the famine-stricken people of Madura, Tinnevelly, Coimbatore, Salem, Cuddapah, Bellary, or anywhere on the line of rail could be brought down to them in tens of thousands by rail, profitably employed, and easily fed; for the granary of all Tanjore would be at their very feet. Though far from their homes in point of distance, they would not be so in point of time, for the wire would bring the news of rain, and the rail could take them back over hundreds of miles quicker, far quicker, than they could walk tens. It could take them to and fro more cheaply, too; for their rail carriage is cheaper than their feeding all the days they are marching. With a little systematic organisation, there is no manner of difficulty in dealing with tens of thousands in this way. It is much less difficult than arranging for a march. It is less troublesome and less expensive in the end to carry them to their food thus than to carry their food to them over all that length of rail for month after month. It is a manner of moving freer from disease to the people themselves, and to the country they move through, than marching large bodies. I made this same proposition on the present famine when I was collector of Tanjore, and prepared to personally put my theories to the test; but I was met by the argument that the proposed projects had not been engineeringly examined (I write from memory), which throws us back again on the position from which I started—the necessity for a special staff of engineers for the sole purpose of having well-prepared projects in readiness.

Such a plan has the advantage of leaving the locality dealt with permanently famine-cured and converted into the means of relieving other places in the future; for every place in proximity to present or prospective rail has afterwards peculiar advantages for transporting its surplus to suffering districts.

I repeat that I do not put the Pattukotai taluk forward as a famine panacea for all the districts of the Madras Presidency, but only as an instance of how rail and canal might be utilised in many localities for so tiding over famines that each one should leave the country steadily advancing to a permanent cure, and temporary trouble might be converted into permanent good.

Major Montgomerie.—The class of works to be included in the schemes of irrigation for famine-relief purposes should not differ in character from the ordinary works of utility brought forward for execution from time to time.

The completion and thorough repair of the existing irrigation works would naturally be the most advantageous to take up first, and with these, matured schemes of irrigation that promise to be directly remunerative. Afterwards those schemes which, although apparently not sufficiently remunerative to Government to admit of their execution from loan funds, but which would still afford the cultivator sufficient profits to make them indirectly beneficial to the State, might be taken up.

The improvements of the Coleroon embankments in connection with the proposed head-works of the Kaveri Delta would be suitable work for the labour of the Trichinopoly, Tanjore, and South Arcot districts, and the proposed river channel and reservoir projects in most districts.

Lieut.-Colonel Mullins, R.E.—Projects for famine-relief purposes would generally be a selection from those brought forward from time to time for sanction in the ordinary course, which might, though desirable and useful, appear to be insufficiently remunerative to allow of their being taken up for execution from the small grants usually available. They would, indeed, be of a description which it might be advantageous to carry out in order to prevent or mitigate the effects of famine; but while funds are available to only an extremely small amount, expenditure has to be confined to works of very immediate and pressing importance, and all others are necessarily left undone. The Rooshkoolia project in Ganjam is a scheme which has been in abeyance, because, the assessments on irrigated lands being exceptionally low in this district, the financial results to be expected were not such as to allow of its being carried out from loan funds, and there was no other money to be had. It would do much for the improvement of the country through which the canal would run, and it is a country greatly needing amelioration. The area to be irrigated is acres 120,000, and the estimates amounted to—

	Rs.
Works - - - -	19,67,414
Establishment - -	5,35,441
Tools and plant - -	1,42,783
Total direct charges -	26,45,638

The calculated net return was 4 per cent., and the charges on which this per-centage is found include interest.

Another work is the Unnamalunka reservoir, in the Godavari district but outside the Delta. Estimate about Rupees 9,00,000.

Area commanded - 128 square miles.
Capacity of reservoir 4,320 millions of cubic feet.
Quantity of water expected to be stored annually - 12,096 do. do.

As a flood moderator it would be useful to the Delta, and it might irrigate 30,000 acres, or possibly more.

This project will probably be brought forward for sanction on its merits as a remunerative work.

The minor rivers in the Nellore district are capable of utilisation to a much greater extent than at present.

River, channel, and reservoir projects in most districts.

River-embankment works.

Enlargement of existing tanks, channels, &c.

Colonel Foord.—The works to be carried out in times of famine should be of precisely the same kind as those that are carried out in ordinary years. On no account should any work be undertaken that was not likely to be useful. The works to be undertaken would, therefore, be buildings, roads, canals, tanks, and repairs of the same. It is not necessary that the construction of large bridges, anicuts, barracks, or cutcherries should be given up in famine years. The expenditure on such works, if they are really wanted, will not be thrown away. There does not seem to be any reason for leaving skilled labourers, as carpenters and bricklayers, unemployed at such times; for not only do such men, receiving from eight to 16 annas a day, each support out of his wages three or four persons, but wherever they are employed they necessitate the employment of more than 10 times the number of unskilled labourers. Buildings are, therefore, quite as suitable works for relief purposes as any others, and no kind of works is more accurately measured and valued after completion. It having been already stated that the class of works to be selected should be the ordinary works that appear in Budgets year after year, it is hardly necessary to specify any works; but it may be mentioned that one of the works taken up for relief purposes during the present famine in the districts of Nellore, Chingleput, and South Arcot has been the extension and improvement of the Coast Canal, several sections of which south of Madras are still in an incomplete state and available as useful relief-works. In the Malabar district there is still available the completion of the inland navigation from Cochin to Tellicherry. In Coimbatore the complete repair of the main line of communication between Karur and Palgaut. In Kurnool the completion of the main road from Kurnool viâ the Nandicanamah ghat to Cumbum and Nellore. In the Salem and Bellary districts there are several irrigation projects that have been under consideration for several years.

Mr. O'Shaughnessy.—Works of irrigation and communication would be included in schemes for famine relief, the latter to include canals, railways, and common roads. The works of irrigation should be taken up in preference to others. These works would not differ from the ordinary works of utility.

(1st.) There are in the district 734 tanks, exclusive of zemindari works, irrigating 192,455 acres; about 425,000 people, or one-third of the population, are dependent on the crops grown under them for food and life, and they yield a revenue of 8,93,524 Rupees yearly. About one-fourth of this number of tanks are in need of repair; the repairs are deferred partly for want of funds, partly for want of labour, and partly for want of establishment sufficient to estimate for the works in a proper manner, or to supervise efficiently the labour available.

(2nd.) There is the Sungum project, estimated to cost 27 lakhs. It would *secure* the irrigation of 94,000 acres of land, which would produce food sufficient for 250,000* people for one year. It would secure the existing revenue of about 2¼ lakhs, and yield an increase of revenue of 2¼ lakhs.

(3rd.) There is what is called the Soméswaram project, designed by the Madras Irrigation and Canal Company, which comprises a navigable canal from Cuddapah to the sea, about 100 miles in length, and which would irrigate a vast quantity of land in its course; this project has been given up for want of funds. There are six small rivers running through the district, besides the Pennair, to which the two last-mentioned projects belong; they take their rise in the Eastern Ghats, and flow direct to the sea, a distance of about 60 miles; they run almost parallel to each other at distances of about 20 miles apart, and nothing has been done to this day to utilise their waters. There are 300 miles of main roads still required to complete the system of inland communications required in this district, and about 50 miles of branch canals are required to connect large towns (including Nellore) with the Buckingham Canal.

Major Mead.—The works to be taken up during times of famine would not differ in character from those ordinarily desirable; but it might frequently be advisable to execute for relief purpose works which would not be of a sufficiently remunerative kind to justify their execution under ordinary circumstances; but during famine, as at other times, a more remunerative work should have the preference over one less so. The difference is one of degree and not of character. The very best class of works are irrigation works involving heavy embankments and the excavation of canals. They are *per se* the most convenient for the employment of large bodies of labour, and have the additional advantage that it is always possible to find works of this class whose remunerative character is beyond question; the time when all possible remunerative works in Salem or Coimbatore shall have been completed is so far distant as not to be within the limits of practical consideration. Speaking generally, it may be said that, the larger the work, the better it is for relief purposes.

Collection of metal for the repair and improvements of roads has been greatly employed during the late famine; it has the advantage of being easy to take up and of requiring little or no previous preparation; but it is not, in itself, a work of great permanent utility, and no very large number of labourers can be employed on it within a small space. It would never be thought of except in the absence of available irrigation works.

The construction of new roads is the very worst form of relief-work; firstly, because the numbers which can be concentrated on roads are very small; and, secondly, because they involve a permanent maintenance charge which the district will, in all probability, not be in a condition to bear.

As practical instances may be mentioned in the Salem district the Kistnagherry reservoir on the Pooniar, the Goodoomullay reservoir on the Swatha Nuddy, the Paniar reservoir on the river of the same name, and the Kudavany project in the Tripatur taluk; of these the two first are works which ought to be taken up on account of their permanent value, irrespective of famine; the existence of a famine would only supply an additional motive, and provide

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* I conceive a fairer estimate would be,—produce of an acre half a ton of rice per annum,—allowing very little over 1½ lbs. per head per diem, half a ton would feed two people for a year; so 94,000 acres would feed 188,000 people for a year.—G.A.B.

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an additional opportunity, for their construction. The two last are works whose execution would be of doubtful policy in ordinary times, but which might well be taken up for relief purposes.

In the Coimbatore district the construction of reservoirs on the Bhowany and other tributaries of the Cauvery would be of permanent value in regulating the supplies to the channels from the Bhowany and Cauvery rivers, and would, from their nature, be useful works for relief purposes, though their direct return might not be sufficient to justify their construction in ordinary times. If waste of water can be put down, several channels from the Ambravutty and other rivers might with advantage be extended.

Lieut.-Col. Prendergast.—New roads: improvement of existing roads, new projects of irrigation, and the extension or improvement of irrigation works. These works need not differ from the ordinary works brought forward from time to time, but they may differ in this way; a project for the restoration of a tank, for cutting a new channel to the tank, or for the extension of an irrigation system by cutting additional channels and improving a series of tanks, may be roughly surveyed, approximately estimated, and discarded, as not likely to be sanctioned. But if the surveys and levels were to be carried on accurately, and the estimate carefully made out, a project would be in hand that might be looked upon as a suitable famine-work, from being of considerable utility, though it would not be accepted for execution from the usual budget funds. The difficulty of obtaining these schemes is that the executive staff has full employment on their usual current duties, and an officer will naturally give up the investigation of a scheme which is to be laid by for future years, when he has ample occupation on the works that he will himself carry out. In the North Arcot district an estimate was sanctioned some years ago for a road from Wandiwash eastwards to the edge of the Chingleput district, to join a road that runs to the Cheean Salt station on the coast. The execution of this road was deferred, and the Local Funds could not provide the money to open it out. The work was sanctioned provisionally as a famine-work, in case of more work being necessary, in the Wandiwash taluk, but nothing was done.

Lieut.-Col. Hunter.—The great desideratum seems to be the employment of unskilled labour, massing it as much as possible, in order that superintendence may be of the cheapest possible character. Works eminently suited for this are railways, roads, and canals, as far as earth-work and stone-breaking are concerned, and differ from works of ordinary utility, as any parts of the scheme requiring skilled labour and professional superintendence, bridges on roads and railways, sluices and aqueducts, &c. on canals, would have to be deferred.

The Wontimitta-Nellore Railway Branch may be taken as a work giving labour in quantities in two districts,—Cuddapah and Nellore.

Major Vibart.—The class of works to be included in the scheme should (in my opinion) in no way differ in character from the ordinary works brought forward from time to time. In most districts there are works which it would seem to be desirable to carry out; but owing to want of establishment of surveyors their investigation is frequently postponed to a more convenient season. In Trichinopoly it would probably be well to have the famine labourers at work near the river, where there would always be found a good supply of water. The famine labour might here be usefully employed in strengthening and improving the river-embankments as well as the banks of the irrigation channels, which may be said to run more or less parallel to the river. Near the river, also, materials for the construction of famine sheds are really available. In this district, there are a few projects, some ready and others in an advanced state, which could soon be made fit for execution—

Vengoor project (before the Government of India) - - -	Rs. 14,000
Kodunthorai tank project - -	„ 15,000
Adappumpullam drainage - -	„ 7,000
Karakkurichi tank - - -	„ 4,000

all near the river.

Total estimated cost of all these, about	„ 40,000

Besides these, there is an estimate for improving the river-embankment in Udaiarpolliem taluk to the amount of about 8,000 Rupees, and more estimates in connection with river-embankments could readily be made. It may here be remarked that buildings, both military and civil, are by no means to be despised as works for affording relief during at any rate the earlier periods of famine distress. In all large military stations (Bengalore, for instance) the Executive Engineer has a long list of works which have been called for by the military authorities, and for which careful plans and estimates have been prepared, but for which, during ordinary times, the Government have been unable to provide funds. When famine approaches it has been usual for Government to put a peremptory stop to military new works which are in progress. It seems to me that the works then in progress should, on the contrary, be pushed on, and that others should be selected for execution from the list above mentioned, with the view of providing labour at the head-quarters of the division, where there are certain to be large numbers of men who would shortly become destitute. Works of this nature would give employment to skilled, half-skilled, and unskilled labour. It might be said that the former classes should be required to work as common labourers; but they are, I submit, entitled to consideration, and it should be remembered that by their earnings they are enabled to support their families; moreover, that by compelling skilled labourers to work as common coolies we demoralise them and bring their families on the works, whereas if the bread-winners are enabled to work at their trade, the Government would not have to provide work for these dependent upon them. It should also not be forgotten that, in an ordinary building, the number of unskilled persons employed is eight or 10 times the number of skilled and half-skilled together.

Captain Brockman.—Roads, bank-repairs, tank-repairs, and the construction of new tanks or reservoirs. No. In Tanjore district, the construction of reservoirs in the dry taluks of Pattukotai and Mannargudi could be taken up as schemes of utility and importance.

Mr. Rundall.—The works would not differ in character from ordinary works of utility, but if the schemes were such as would prove financially successful, their execution is sure to be urged on the ground of the material improvement they will afford; hence, it is probable that only works whose financial success is doubtful would be kept in the category of purely famine-works. I would instance the Shanmuganadi reservoir project in Palni taluk and Gollapuram reservoir in the Periyakulam taluk, of Madura district, as one of this class of works.

Mr. Traill.—Partly answered above. The most useful works would be road-repairs, deepening and clearing out of spring-channels and earth-work to tank-bunds, also the excavation of wells for irrigation purposes. With the exception of the first mentioned, they are all open to the objection that the works are not of sufficient magnitude to employ any large body of coolies on one spot, and so greatly increasing the staff of supervising officers who would be necessary. With the exception of the excavation of wells, these works all resemble in character those for which provision is ordinarily made in our budget.

Mr. Simson.—A very suitable work on which to employ sufferers by famine would be the improvement of the port at Cocanada and an extension of the canals and roads in the district. The labourers might be deported from the famine-stricken districts for this work, and would thus be placed in a province always well provided with food, and to which, if the local supplies were insufficient, grain might be easily and cheaply brought from other places by sea.

CH. IV. QN. 4.

QUESTION 4.—AUTHORITY FOR THEIR EXECUTION.

Should the works in such a scheme be looked on as immediately available for giving employment as relief works at the discretion of the local governments, or under what circumstances might the authority of the Government of India be held to be required?

SUMMARY.

Opinions differ. Generally speaking, it is said that district works might be left to the discretion of the local government, but that larger works might require the sanction of the Government of India. In Bombay the chief engineer advocates the absolute discretion of the local government in such matters.

PUNJAB.

PUNJAB.

General Maclagan.—No application for authority of the Government of India would be required for carrying on any of the provincial or district works as relief-works. They can be looked on as immediately available for giving employment of this kind at the discretion of the local government.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—I would insist on necessity of sanction of Government of India to commencement, for purposes of famine relief, of any schemes which would involve expenditure of Imperial funds, or require the sanction of Government of India in ordinary times.

Mr. Sells.—I do not think that such schemes could be kept up for each district separately.

The district of Muzaffarnagar, for instance, might furnish work during a moderate and short-lived scarcity, but I know of no works that could afford employment to the aggregate poor population in the district during a long period of famine or even severe distress. The extension of railways and canals seems of all schemes that which offers the maximum amount of labour, combined with maximum utility and profit to the State. If such a scheme is really to be adopted, I would suggest that surveys be made and plans prepared showing the most feasible methods of extending irrigation to tracts hitherto dependent upon rains or wells, and of connecting the various centres of trade throughout each province separately.

I do not think it would be possible to work out such schemes for each district separately, or, in the case of *very severe* famine, to confine the people within the limits of the district. It would be in many cases advisable to draft the people off to large works where labour was most required. The maturing and maintenance of such schemes must, I think, devolve upon the head-quarters staff of the Public Works Department.

Mr. W. C. Plowden.—The test in such a matter appears to be the fact of the provincial government having allotted, or being able to allot, funds.

If they cannot do this, or have not done so, it would be necessary to obtain sanction from the Imperial Government for the opening of such works.

Major J. Liston.—I can only answer this question as regards this district, and I think it should rest with the local government to sanction all works.

As already stated, famine here is caused by the failure of the kharif crops, and comes on with so little warning that the delay in obtaining the sanction of the Government of India would in all probability cause loss.

Moreover, it is not likely that, in such a sparsely populated district as Lalitpur, any works of very great magnitude will ever be started.

Mr. J. G. Anderson.—District schemes should be left to the discretion of the local government, and provincial ones to that of the Government of India.

Mr. Edwards.—The works should be immediately available for relief at the discretion of the local government.

BENGAL.

BENGAL.

Colonel Cadell.—The authority of the Government of India would be required for railway works; all others would be sanctioned by the local government.

Colonel Haig.—With regard to the question whether works intended for execution in time of famine should be looked upon as immediately available for giving employment as relief-works at the discretion of the local government, it would probably be necessary to fix some money limit within which the authority of the Supreme Government would not be required. For all larger schemes the special sanction of the Government of India might be necessary.

Ch. IV. Qn. 4.

Bombay.

BOMBAY.

Mr. Hart.—I should advocate the absolute discretion of the local government in such matters, when prompt action is so essential to success in dealing with a famine.

Colonel Anderson.—Such works might generally be taken up at the discretion of the local government on the Government of India sanctioning famine-relief works being undertaken. If the work and consequent expenditure were large and formed part of a railway system, the sanction of the Government of India would be necessary, but it might previously be conditionally ascertained.

Madras.

MADRAS.

Lieut.-Colonel Mullins.—The selection of works for famine purposes should rest with the local government; more especially is this necessary at the commencement of relief operations, when delay in taking action is fatal to efficient arrangements.

Major Montgomerie.—Schemes of irrigation should not as a rule be taken up for famine-relief purposes until properly worked out, but whether fully matured or not their commencement must be left entirely to the discretion of the local government.

Colonel Foord.—In reply to Question 4 it may be stated that as necessity for famine relief does not suddenly arise, but can always be foreseen months in advance, there will always be time to obtain sanction for the works proposed to be carried out, in accordance with the usual practice in such cases. Much of the distress at these times might be relieved, at first, by increasing the ordinary grants for repairs of roads and repairs of irrigation works, estimates being prepared for works before expenditure is incurred.

Major H. R. Mead.—The most convenient plan would probably be for the Government of India to sanction a total grant (according to the magnitude of the distress) for famine-relief purposes, in addition to the ordinary budget grants.

The schemes, being *ex hypothese* prepared beforehand, should be *provisionally sanctioned* under precisely the same rules as ordinary budget works. On the occurrence of famine or severe distress a total limit might be fixed by the Government of India, according to circumstances within which the local government would sanction for execution works the estimates for which had previously been provisionally sanctioned.

Lieut.-Colonel Prendergast.—Schemes that have been sanctioned or approved by the local government should be at once available as relief-works at the discretion of the local government. The authority of the Government of India might be held to be required in the case of a project having been previously looked upon unfavourably by the Government of India, or in the case of a deviation from the order of priority of works in a general scheme, such as a system of railways as mapped out by the Government of India.

Ch. IV. Qn. 5.

QUESTION 5.—RESPONSIBILITY FOR THEIR MAINTENANCE.

If severe drought calling for the employment of labour on a very large scale, and in an exceptional manner, occurs at comparatively long intervals, how will it be best practicable to arrange for suitable projects, which, though suspended, must yet be fit for early execution? On whom should the responsibility of maintaining such schemes in an efficient state rest, and how could it be enforced?

SUMMARY.

The maintenance of such schemes should rest with the chief engineer or with the commissioner or collector in communication with him.

Pun.

PUNJAB.

General Maclagan.—The best practicable way of providing for the requirements of such a case as is supposed in this paragraph 5, as well as for others, seems to be by the course above described. A large work really required would not be kept back from execution at any time on account of its being a particularly good work for giving employment to the distressed people in time of scarcity. It may happen that sometimes no suitable large work has been proposed or can be thought of, in some particular part of the country, and advantage would have to be taken of large works elsewhere. For some time to come there seems good prospect of railway and canal works being available without needing to abstain at any time from the execution of any work that is required.

The responsibility of maintaining a record of sanctioned works, provincial and district, ready for execution, including works suited for famine relief, should rest with the chief engineer.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—If the designs and estimates of a certain number of projects, suitable for famine relief, were drawn up in full detail and recorded in the local chief engineer's office, their alignment and the commencement of work upon them, could be very speedily arranged. The work afforded by such projects and

CH. IV. QN. 5.

NORTH-WESTERN PROVINCES.

by the regular budgetted public works outlay, would, in most cases, provide sufficiently for the earlier demands for relief, and give the local government time to mature such additional schemes as might appear necessary for meeting further requirements. The responsibility for maintaining such projects in an efficient state should rest with the Local Government.

Mr. Plowden.—Here it is assumed that there is a list of suitable projects ready for early execution, which are either suspended because they have been interrupted by good seasons, when the necessity for continuing such works had disappeared, or have not been as yet commenced. It is asked who should be responsible for maintaining such schemes in an efficient state, and how can such responsibility be enforced? This assumption rests on a possible necessity for the employment of labour, *i.e.*, unskilled labour on a very large scale and in an exceptional manner, and on this necessity recurring at long intervals of time.

I cannot comprehend such a position as is here assumed, if it is meant that the works to be included in these schemes may comprise projects not to be completed when once set in hand. If it is advisable to employ labour on any definite work the money so expended will have been, for a time at all events, expended without any return so long as the work on which it is spent is incomplete. But if it is so far completed as to give any return, then it does not come into the category of works to which I understand this question to relate, *i.e.*, works suspended before they have been so far carried forward as to be of use. I omit at present from consideration works projected but not commenced.

If I am not correctly apprehending this question, and it is intended to refer to works which have been begun and suspended, but have been so far completed as to be of use, so far as they go, though by extension they can be made of further utility, or to works which have not been commenced before, though projected and completely planned and estimated for them, it seems to me the answer is simple. The question consists of three parts :—

1st. How will it be best practicable to arrange for suitable projects.

2nd. Who is to be responsible for maintaining such schemes.

3rd. How can this responsibility be enforced.

The reply to the first part of the question I take to be this :—

You must find a project which embraces a very large quantity of work requiring unskilled labour, *i.e.*, either excavation or earthwork ; this must either be a self-contained work, or may be one which, in so far as it goes, will be complete, but can be supplemented so as to be of equal or of greater value by extension or by branches in connection with it. You are thus restricted to roads, canals, railways, or tanks.

Wells, I think, may be put out of the question, as not the class of work which would enable us to employ a large amount of unskilled labour, or to exercise proper supervision, if unskilled labour in sufficient quantity could be employed.

The last class of works would be determined by the district authorities with the aid of the engineering assistance available in each district.

For the first,—roads,—I think the proposals should be inaugurated by the district authorities; but their proposals should be sifted by the divisional officers, revenue and engineering, so as to secure that isolated schemes are not admitted, while more continuous projects, which would benefit a larger area by improving through communication, were lost sight of.

The same remarks would apply to canal projects. But they must be inaugurated by the canal officers and district officers, acting in concert, and would have to be sifted eventually by the head-quarter office of the Irrigation Department, so as to determine in what order, with due advertence to their utility and economy, the schemes might be admitted.

Railways would have to be treated in the same way as canals.

2. The next question, "Who is to be responsible for maintaining such schemes?" this is to a great extent disposed of by considering who are the persons who have to arrange for these projects.

I should make (*a*), the district officer responsible for maintaining the schemes for tanks; (*b*), the divisional office for maintaining the projects for roads; (*c*), the superintending engineer's office for maintaining the schemes for railways and canals.

The responsibility in each case being enforced by a memo. to be delivered by the out-going officer to his successor, a report going up at the time of transfer of office, which would show to the officer immediately superior whether this responsibility was maintained.

Mr. Edwards.—Railway projects will be the most suitable. If the surveys of the proposed lines are duly prepared, and deposited in either Commissioner's or Collector's offices, the work can be commenced at once, and on a regular system, immediately the necessity arises. Petty works, such as are called for at the beginning of distress, *e.g.*, raising and embanking roads, filling up tanks, and such like, need not be specially arranged for beforehand with a view to relief. Numerous petty schemes are prepared and entered in each year's budget but delayed for want of funds ; these can be started, and will afford sufficient employment until it is found necessary to open larger works, such as railway extensions.

BENGAL.

BENGAL.

Colonel Cadell.—The best way of arranging to have suitable projects ready for early execution would be to insist on the preparation in each district of projects in advance of what could be undertaken with the funds available for each year.

Since the development of the Road Cess system such projects would be prepared principally by the district engineers, and Commissioners should be responsible that the schemes be kept up by the district committees in communication with the Secretary, Public Works Department.

MADRAS.

MADRAS.

Colonel Mullins. — *Maintenance of Schemes in readiness.*—It will not be altogether easy to keep projects in complete readiness for execution when famine-relief operations become necessary, but once properly worked out it is not probable that material modifications would have to be made, and any severe drought necessitating the employment of labour on a very large scale is sure to give ample warning and time for preparation.

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MADRAS.

Major Montgomerie. — The Chief Engineer for Irrigation and his staff must alone be held responsible for the preparation and maintenance in an efficient state of all schemes of irrigation, whether they are to be carried out in the ordinary manner, when funds are available, or postponed to a more convenient season; complete copies of all schemes should, however, be maintained in the offices of the superintending and divisional engineers concerned.

Colonel Foord. — Question 5 has already been answered. It has been recommended that registers of useful works should be kept in the offices of the district engineers and superintending engineers, that the plans, estimates, and specifications of these works should, from time to time, be examined and, if necessary, revised. Works that have been carried out in whole or in part should be wholly or partially removed from the registers, which will then contain only those works that should be carried out when the necessity arises and funds are available. The responsibility of seeing that these registers are kept up should rest with the chief engineer.

Majors Mead, Pennyeuick, and Capt. Awdry.— This question will settle itself when the schemes are prepared; in general the responsibility will rest with the executive engineers of divisions under the control of their departmental superiors. The question is one of administrative detail, involving no difficulty whatever.

Lieut.-Colonel Prendergast. — Works on a very large scale require special arrangements for the preparation of plans and estimates. In many districts at present nothing on an extensive scale is contemplated, and nothing will be ready on the occurrence of severe drought. District officers are unable to provide the extra establishment required for the surveys and estimates. Special officers will be needed with a subordinate staff, and as this involves additional cost under establishment, sanction must come from the highest quarter, that is, from the Government of India.

Mr. Traill.—If the estimates for any large work, and also the plans, have been prepared, the work could be commenced at a day's notice. It would be necessary to suspend entirely all ordinary works, so as to set the existing establishment free for purposes of supervision, &c.

The experience of the last famine showed clearly that there is a far too small proportion of upper subordinates (overseers and supervisors) available for any special work.

The responsibility should rest upon the divisional officer of maintaining schemes in a fit state to commence work upon them at a moment's notice; but, as before stated, this division is not suitable for the projection of any large scheme, and, as small works would have to be substituted, the necessity of having extra establishment of the upper subordinate class available becomes more apparent.

CH. IV. QN. 6.

QUESTION 6.—THEIR RELATION TO NUMBERS REQUIRING RELIEF.

What number of persons is likely to be thrown on relief-works in an extreme case, and how should such a scheme be framed as to indicate what portions of it should be taken up on any particular occasion in order to provide for the employment of the anticipated numbers and for the length of time required?

SUMMARY.

The result of the answers appears to be briefly that, given a scheme of works and a knowledge of the numbers they would give occupation to, it would not be difficult to commence them in the sequence of their importance.

PUNJAB.

PUNJAB.

General Maclagan.—The number of persons likely to be thrown on relief-works in an extreme case it would not be easy to estimate. The number is augmented by people from adjoining native states, when these states have suffered equally with the British districts, or much more, as in some cases. In the famine of 1868, and at other times, people of Bikáner have come in considerable numbers to the Punjab in search of work and subsistence. In the present year certain works in the northern districts of this province were carried on chiefly for the benefit of people from Kashmír.

In 1868–69, which was a time of great but not extreme pressure, in the districts south of the Sutlej especially, the number of persons employed on works was 1,060,059,* and of infirm persons relieved gratuitously 2,435,404;* the number of people who received gratuitous relief in the three districts of the Hissar division was 1,383,636.* The largest number of persons employed on works in any district was 643,402* in Rohtak, and of the infirm 792,194 in Karnál, the number of women in each of these cases exceeding the number of men. With an early supply of easily accessible work the proportion of people in employment would be higher.

In the famine of 1860–61, which was also chiefly in the country between the Sutlej and the Jumna, the amount expended on—

Relief-works was	-	Rs. 3,25,106
Takávi advances	-	„ 2,75,000
Gratuitous relief	-	„ 7,83,945

The number of persons employed on works is not recorded. The number of persons fed daily amounted in July 1861 to 116,000. In the Delhi division the aggregate number of persons employed and gratuitously relieved, during the whole time of the pressure, was 40,176,190.* Works were not systematically undertaken at that time, and many had to be devised for the occasion.

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* Lieutenant-General Maclagan permits me to note that these figures give, not the number of the persons relieved, but the sum of the numbers relieved daily during the whole period of relief operation. For further information on the subject, see the reply to Question 2, Chapter I.—E. WACE.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Mr. Plowden.—It is impossible to say what is the outside number of persons that might in times of the most severe famine be thrown on relief-works. But every scheme should indicate the amount of unskilled labour which it is capable of giving work to. With this information and with each scheme numbered in the order of its utility (and I think it is essential they should be so numbered), there would be no difficulty in arranging for the employment of the number that might be proved to require employment for the length of time such requirement might last.

Mr. Colvin.—60 or 70,000. I cannot answer the last part.

BOMBAY.

Bombay.

Colonel Anderson.—The numbers requiring to be provided for in the late famine* may be taken as the maximum number requiring to be provided for in the future. In any scheme the most immediately useful part of it could be indicated without difficulty, and finally decided on in the month or so which must always intervene between incipient scarcity and actual famine.

Mr. Propert.—It is difficult to estimate the number of persons likely to seek relief in an extreme case. The population of the Kaladgi collectorate is about 816,037. Kaladgi was more heavily afflicted than any other Bombay district, and I find that the greatest number of persons on relief-work at one time was 123,277, or about one-seventh of the population. This would give a total of about 143,000 persons for Khandesh, where the population is about 1,000,000, supposing the province to have reached the condition of Kaladgi; although had rain not arrived late last season, judging from the condition into which the country was falling, I should not have been surprised at seeing 200,000 persons seeking relief. Circumstances, however, might alter these numbers very materially; for instance, if an extreme famine were to arise after two or three years of scarcity, so many people in all probability would be unable to withstand the visitation that we might be called upon to assist at least a quarter of the entire population. In such matters, however, it is difficult to form an estimate of any value.

If road or tank schemes be carefully prepared and sanctioned beforehand, there would, I think, be no difficulty in selecting portions to be taken in hand according to the severity of the scarcity or famine.

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* From 8 to 23 per cent. of the population of a district.

MADRAS.

Madras.

Mr. Sullivan.—In Kurnool, Bellary, and Cuddapah, the three districts where the effects of the famine were most severely felt, it happened that on the 6th January 1877 the largest number of labourers assembled on relief-works in all three districts. On that day there were in—

Kurnool - - -	323,338=33·69
Bellary - -	398,961=23·91
Cuddapah - -	201,061=14·88

per cent. of the population. These figures are exclusive of the numbers who were in receipt of gratuitous relief, and taking them as a guide it may be assumed that in an extreme case it would be necessary to provide work for not less than one quarter of the population.

Distress of a nature so severe as to require measures of State relief is not likely to be confined to the limits of a single district, but will probably embrace the whole tract lying within the same climatic influence. In framing a scheme of works to afford employment to such vast numbers as would, under these circumstances, stand in need of it, the following conditions should be kept in view:—

(1.) The selection, as far as possible, of such works as would afford uninterrupted employment for the whole period of distress;

(2.) The disposition of works so as to bring them within moderately easy reach of the famine-stricken population; and

(3.) Concentration of labour in view to economising supervision.

In dealing with large bodies of labourers, time must elapse before organisation and discipline can be introduced; but if they are employed as much as possible under the same officers, on the same description of work, and under a uniform system, comparative order and regularity take the place of the indiscipline and confusion which must prevail when the conditions above indicated are absent. Lines of railway and tramways connecting large towns and trading centres with each other and with the coast, and canals for navigation or irrigation, or both, suggest themselves as works to which prominence should be given in a scheme having for its object the employment of famine labour, as they would traverse a considerable length of the tract affected, would be moderately accessible to a large number, could be easily supervised, and, if ready planned beforehand, any portion could be staked out and commenced on immediately the necessity for work arose. Surveys, levels, and estimates for such projects should always be in readiness, and the difference between the actual expenditure and the estimate would give approximately the nominal loss to the State caused by the employment of famine labour. The expression *nominal* loss is used advisedly, because, of course, the preservation of life and the means afforded to the able-bodied population of tiding over a disaster which would otherwise sweep them away, must, in the long run, operate beneficially for the common weal, no matter at what price the object is attained; and if the works are opened in time, if the helping hand is held out to the people before their physical powers are half exhausted, and, above all, if whilst employed by the State they receive a wage sufficient to provide the sustenance necessary for a labouring man, such difference would be reduced to an almost inappreciable point, and would, in reality, represent little more than the enhancement of wages rendered necessary by the famine prices of articles of food.

Although projects such as are indicated above should form as it were the back-bone of a system of relief-works, it would not generally be possible to have more than one or two such in each district; and as the districts in the Madras Presidency embrace an area varying from 1,000 to 11,000 square miles, it is evident that they would be difficult of access to many residing in remote localities. It would, moreover, be unadvisable, on sanitary and other grounds, to concentrate the vast amount of labour available in seasons of scarcity in one or two spots, and the scheme should, therefore, provide for employment being given in other parts of the district. In view to this, each district should be divided into circles of a size to admit

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Madras.

of thorough supervision on the part of both the professional department and the relief officers entrusted with the payment of the labourers.

The works which suggest themselves are—

(1.) All works not requiring skilled labour for which provision has been made in the year's budget;

(2.) Works of a similar description which have been sanctioned, but the execution of which has been deferred for want of funds;

(3.) Works which have been professionally investigated, but for which estimates have not been submitted for sanction;

(4.) Works, the execution of which, except under famine pressure, it might be a doubtful policy, financially considered, to undertake, *e.g.*, clearing silt from the beds of large irrigation tanks.

To combat a famine successfully, however, a good deal more is required than having ready to hand a scheme of works, although this is, no doubt, an essential preliminary. To do battle with an agency of nature which, though apparently no bigger than a man's hand at its inception, gathers force as it moves along its destructive path, the whole plan of the campaign must be carefully laid down beforehand, the general appointed, and the forces marshalled. There must be preparedness at all points to meet an emergency calculated to tax the resources of the State and the energies of its officers in an unusual manner. In laying down a plan of operations, then, the following points should be kept in view:—

(1.) The recognition of the abnormal character of the situation;

(2.) The consequent necessity for modifying the usual system of administration;

(3.) A distinct understanding that the primary object of State interference is to *save life*, and that financial considerations are *not* to be allowed to defeat that object.

The partial break-down in the scheme of relief operations in the early part of the famine was undoubtedly attributable to the exact position of affairs not having been fully apprehended at that time. An extraordinary emergency had arisen, and an effort was made to cope with it with means and appliances which perhaps met every-day requirements fairly enough, but which were utterly insufficient to resist the abnormal strain which was brought to bear on them as the distress amongst the people spread and intensified. For some months after it was an admitted fact that the famine was sore in the land, not a single addition was made to either the European or Native agency in the Revenue and Public Works Departments; correspondence was carried on in the usual circuitous manner required by official routine; and had it not been that most of the local officers, realising the dangers of delay, took it upon themselves to break through this impediment to action, the results would have been yet more disastrous than they were. The cautious manner in which public business is very properly carried on in ordinary times must be abandoned where everything depends on promptitude of action. Projects intended to furnish employment and food to starving multitudes cannot wait to be filtered through two or three departments, but must be started at once. At the same time, it would be an unwise policy to withdraw relief operations from all control, and allow them to be carried on in accordance with the idiosyncrasies of each individual officer; this would result in the wildest confusion, reckless expenditure in one district and injurious parsimony in another, and spasmodic efforts would take the place of an organised system. There must be a controlling head,—one to be carefully selected, but in whom, when once installed, plenary authority should vest. As Famine Dictator, his word should be law to his local lieutenants scattered over the country, and to accomplish his task successfully he must have the fullest support of the Government. His powers as to expenditure should be unlimited. He must determine which of the matured projects should be undertaken, and what new ones should be investigated in view to providing for future requirements. It will rest with him to decide the additions necessary to be made to the local staff, the distribution of the officers, and the system on which work is to be conducted. The fullest discretion should be left to him as to what districts should be brought under State relief, and from which such aid should be withdrawn; and in all matters of administrative detail he should, of course, be supreme. He must, in brief, as the plenipotentiary of Government, wield that authority which, as a collective body, they are unable to exercise with the promptitude which the emergency of a widespread distress demands. Allusion has not been made to the powers of the Dictator in regulating the rates of labour wage and gratuitous relief, as, after the dire consequences resulting from the crude experiments which were allowed to have a place in the system of relief in the early part of the recent famine, it is presumed that this most important question will be determined, on scientific principles, in a manner that will utterly preclude similar disasters in the event of another emergency arising.

The local officers in charge of relief operations would be the collectors and engineers of districts, and their subordinates, with such additions to the strength of the latter as might from time to time seem necessary. The experience gained in the recent famine indicates the expediency of relieving the engineering staff of all but strictly professional work. To make them paymasters of labour, and administrators of the details of famine relief, is to assign them duties which can be just as well performed by less skilled agency, and which take them away from work which can be satisfactorily executed by scientifically trained men only. The officers of the department feel this. They chafe against a system under which their professional acquirements are not utilised to the fullest extent; and it can hardly be wondered at if the alien duties thrust upon them are more or less perfunctorily performed. It is not in the nature of things that a good engineer, who prides himself on the quality of his work, should make a good relief officer. The habit is strong in the former to pay only by results, and those of famine labour hardly come up to the standard of professional excellence. The number of engineers, moreover, in this country is limited; and even in ordinary times their services are actively in demand for scientific work. To another agency, therefore, should be assigned the details of relief administration; and this part of the question is not altogether free from difficulties. In no country in the world, perhaps, does there exist, ready to hand, an organisation better adapted to deal with the masses than is to be found in the local institutions of the Madras Presidency. The village, the taluk, and the district are all links in the chain which connects the humblest ryot and the meanest artisan with the Government; each is in itself an organised system of government, and each is dependent on the other. But admirable though the system may be in theory, it is, so far as the object under notice is concerned, practically valueless in consequence of the gross and incurable corruption of the subordinate agency. Nor, unfortunately, is this confined to the lowest class of officials; in a more or less degree it pervades all ranks of the native establishments, from the village monegar to the tahsildar of the taluk. There are, of course, individual exceptions, but they are few and far between, and, having such odds to contend against, are impotent to check the progress of this widespread Oriental vice. That, then, which under other conditions would be a most valuable instrument in the hands of the State is, in reality, a source of weakness and danger, inasmuch as it represents a powerful organisation, through whose means alone the masses can be reached, but whose object is to divert as much of the stream of benevolence as possible into their own pockets. To this tribe of vultures a time of famine means a time of plenteousness and good living. To use a native expression, they take with both hands—they cheat the Government who pay them, and they take toll from the famishing wretches whose misery they are employed to alleviate. Their agency cannot be dispensed with, and therefore it becomes necessary to keep them under strict European supervision, by which, to a certain extent, their knaveries and peculations are restricted; and it is this unfortunate necessity which enhances the cost of relief to an incredible extent, for, to be of any practical use, the European staff must be of sufficient strength to admit of a supervising officer visiting every relief work and camp at frequent intervals. And even then, the difficulty will be only half overcome. The people are so accustomed to be fleeced by their compatriots in office in ordinary times, that the levy of a contribution on their famine pittance appears to them almost as a matter of course. The English relief officer may himself see the famine dole placed in the hands of the proper recipients, but his back is hardly turned before some harpy or other has made it pay toll; and, on the other hand, funds placed in the hands of native officials for the purposes of relief will, in 50 per cent. of the cases, be surely misappropriated; and detection is next to impossible. Nominal rolls of the recipients and vouchers, prepared in the most business-like manner, will be submitted to the supervising officer, who, whatever may be his suspicions, has no alternative but to accept them. It is clear, then, that the European supervising agency must be kept up to a strong point of efficiency; but whence are the members of the staff to be drawn? In the recent famine, the numerical deficiency was supplied, partly by volunteers in the Presidency not in the service of Government, and partly by officers belonging to other presidencies, whose services were temporarily placed at the disposal of the Government of Madras. In regard to these last, most of whom were drawn from the army, there is no question but that they were placed in a very difficult position. New to this part of the country, and ignorant of the language, habits, and institutions of the natives of Southern India, they suddenly found themselve saddled with heavy responsibilities of an entirely novel character. Entrusted with the disbursement of large sums of public money, it devolved upon them to see, not only that a fair return was made in the shape of labour, but also that the State relief reached every individual of the masses who thronged daily to the works and camps. They had to hear complaints and give redress; to determine who should work and who should be fed gratuitously; to lay out camps; to provide for sanitation; and, in short, to carry out with care and exactitude all the details of relief administration. Not knowing the language, there could be no direct communication between them and the people; and it is hardly to be wondered at that the situation was clearly turned to account by the unreliable and rapacious subordinate agency who intervened. Men who had long resided in the Presidency, and who had an intimate knowledge of the people and their language, found it a difficult task to hold their own, and therefore it is no disparagement to these officers, who honestly tried to do their duty under great difficulties, to say that their administration of famine relief in Madras was not so successful as it might have been, had the work been assigned to officers belonging to the Presidency. As a matter of fact, the Madras Army was hardly at all indented on for aid during the late emergency; and, considering the number of unemployed field officers available, it remains to be explained why their services were not called into requisition in preference to seeking assistance from other Presidencies.

Lieutenant-Colonel Mullins.—It does not appear to be practicable to give any answer that would be of practical value to the first part of this question. The actual numbers receiving relief in one form or other in each district during the famine of 1876–8 is known; but there has been so much famine during the preceding quarter of a century, and scarcity and distress have usually affected only comparatively small areas at any one time. Besides, it depends very much upon the system followed, whether a small or large proportion of the distressed population will come upon relief-works. It is not necessary that, even in such a severe crisis as that of the hot weather of 1877, relief-works should be so utterly swamped by numbers as was the case in Bellary and Kurnool. No one can, it is thought, forecast both the numbers and the duration of time of such numbers. With regard to the latter part of the question, it must be noted that most projects admit of a natural sequence of work, and also of the execution of any required quantity of it, so that any part up to the completion of all the work of descriptions suited to unskilled labourers could be taken up. In the case of large canal schemes, the work should be carried out on a small scale from end to end of one or more sections in the first instance, and then enlarged should continued employment for labour be found requisite.

Major Montgomerie.—During seasons of extreme famine nearly the entire agricultural and labouring classes are certain to be thrown on the hands of Government in the first instance, and afterwards a great proportion of the remaining population. Their numbers will, of course, depend on the duration and severity of the famine. To find employment for the first-named class on useful irrigation works in the ordinary manner, there would be no difficulty whatever, provided schemes for such works in convenient localities are in readiness; due notice being given before the commencement of the work, and the executive establishment strengthened in proportion to the extra grants made. By the Madras Famine Order, No. 2847, dated 24th September 1877, this important class, equally with the rest of the population, were prohibited from employment on the works until it was certified that they had become indigent, destitute, and capable only of a modicum of labour; and then only were they permitted to earn a mere subsistence allowance, although they were able and willing to execute any quantity of ordinary unskilled* work, if paid for their extra labour. In fact, they were only permitted to perform a moderate task at a high rate, instead of a greater quantity of work at a much lower rate. The hardship of this arrangement was principally felt by the wudders and other labourers who usually execute work by the piece, not only for Government, but for the land-owners. They are accustomed to work hard, and require more sustenance than the ordinary native of a town. Of the second-named class of the population, the professional beggars and mendicants are totally unfit (morally or physically) to perform any work whatever. They should either be kept in closed camps, or deported from the locality. The shop-keepers, weavers, and higher castes generally, are very little better at manual labour than the mendicants. They leave their homes with the greatest reluctance; and if they are to be employed on irrigation works, special rules for working them should be laid down. The lower castes, on the other hand, although not usually given to hard work, would soon become proficient, and quite able to compete with the ordinary labourers. Some of the best gangs of workmen between Rajahmundry and Madras are composed of horse-keepers and others who were recruited 15 or 16 years ago in Bungalore and other large towns for the Upper Godavari works.

Mr. Price.—This question is a very difficult one to which to give a reply of any value. The largest number of persons on works in this district during the famine, on one day,† was 32,349. Supposing that the whole of these belonged to Chingleput, which it is known was not the case, although it cannot be stated what proportion belonged to other districts, the percentage on the population would be 3·44. But there is another question to be considered before deciding what proportion of the people could, in an extreme case, be expected to come upon works; which is, what number of the individuals who were employed upon them during the month that numbers were the highest, would have, had a sufficiently large supervising staff been available, been eliminated as being persons not absolutely requiring relief. What it was here it is impossible for an officer not personally acquainted with the state of affairs to determine. In any case, a rough estimate only could be made. Judging from my experience and observation in the Cuddapah district, where I inspected many thousands of coolies, I should say that about 25 per cent. of the people on works could have been turned off if there had been sufficient officers of the superior grade to look closely into the circumstances of each individual in the gangs. The enforcing of the "distance test" showed how many who were not in absolute necessity got on to the works.

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* Earth-work, stone-quarrying, collection of metal, &c.

† 1st September 1877.

Allowing that the same was the case in this district, the largest number that ought to have been on the works was 24,262, or 2·58 per cent. of the population. We could hardly have a worse famine than that which has now nearly passed, and the highest figure of persons on works, less the deduction made, can be fairly assumed to represent an "extreme case." I have already indicated in my replies to another portion of the questions asked by the Famine Commission, my ideas as to the system to be followed in affording relief by giving works in times of distress. This involves the drawing up beforehand of a scheme of works for each district; and, as I know nothing of those which would be or ought to be made available for famine relief, I can give no scheme such as that mentioned. To make any calculation, it must be known beforehand what works can be made available. These, and the amount of employment which each will afford, being ascertained, the number of persons who can be taken on each, and the number of days for which they can be employed, can be easily fixed.

The average increment, either per week or per month, of persons requiring work can be calculated with moderate accuracy, and it can then be decided what works it will be necessary to take in hand at any particular period. The famine, it is true, has shown that increases and decreases upon works took place suddenly and sharply; but I am very much inclined to think that had everything been cut and dried beforehand, had a sufficient staff been at once available, and had distress been everywhere taken in time, this would not have occurred. It was the want of proper works, of tools and supervision, the injudicious leniency of some officers, and the equally injudicious harshness of others, that, to my mind, mainly caused the enormous fluctuations in numbers upon the works which from time to time took place during the famine.

Mr. Turner.—I do not think it is possible to frame a scheme which could be adapted to all districts alike.

To frame such a scheme for any district would require the closest knowledge of the various peoples and tribes living in that district, and an intimate acquaintance with their habits under somewhat analogous circumstances. The people will have the same tendency to follow a certain given course in times of famine as in times of ordinary scarcity, only in times of famine the tendency is immensely exaggerated. For instance, take the Madura district during the late famine; the distress was of course most severely felt among the village hangers on, such as pariahs, chucklers, &c., and among the agricultural population of the uplands, where the crops always yield but a poor return, and where consequently the *mass of* people are always on the margin of starvation. In times of distress the able-bodied of the first class will go away in search of work either in their own district or elsewhere according as they have been accustomed to obtain labour near at hand or by emigration. The same will occur among the agricultural population. The able-bodied men will set out to that part of the country to which they have been accustomed to resort in ordinary years of scarcity. As the scarcity progresses another and again another wave will set off in the *same direction*. In this way during the late famine I met crowds of people on the wander to "Nagore,"* "Colombo," and "Periyakulam." You cannot stop these people by saying, "You won't get work where you are going, the place is overstocked; stay and work here." It is a fact that crowds of coolies used to pass the works in the Ramnad zemindari on their way northwards, and nothing would induce them to stop and work on the Ramnad works. But there are a very considerable number of people in the Madura district who never do work to any useful purpose. These are, for the most part, the refuse of the village servants and a considerable class of people who gain a precarious existence by a little agriculture, a little shikar, and a great deal of thieving. To this class belong the Kullans,† and the effects of famine on this class were very noticeable in the immense increase of cattle-lifting and crime generally. Neither of these two classes will do a bit of work, unless, perhaps, it be to their own village tank. The first class filled our roads and relief camps with famine subjects, and the second filled our jails. Deducting these two classes, deducting also the able-bodied who have emigrated in search of labour, and deducting a rather large class in Madura district always above the reach of famine, it follows that there are very few left in the district who can or will work, and *almost none* who can or will leave their villages for work at a distance. Those left in the most famine-stricken parts of the district are, therefore, chiefly women and children. The few able-bodied men left behind are those whose services cannot be dispensed with unless the whole village system is to be ruined. These are retained by the rich men of the village for sinking wells, &c., and in addition almost every house will, except in the most extreme famine, retain one adult male to look after the cattle and house. Of course, these cannot leave their villages; if they do, everything will be stolen. I knew that the greatest distress was felt by this class, and they are the most difficult to relieve. They cannot go to works at a distance or camps; at least, if they do, they and their family must be ruined, and rather than betray their trust they will often die of want. I think, therefore, it will appear clear that in a district like Madura, where extensive emigration in search of work is the *custom*, you want very few *large works for able-bodied* labourers. If you have such works I doubt whether you would get much more labour for them in a famine season than in any other.

As a precaution, however, a few such works should be kept ready in case of accidents. In the first and second stages of a famine, therefore, a district like Madura will want very few famine-works, but in the third stage you will want light work for vast numbers of women and children; I cannot say for how many, but I dare say for one-sixth, of the women and children of the lower-class population. In addition to the above you would want work for a large number of weavers who do not emigrate; work, however, is best given to this class in the shape of advances to enable them to follow their own trade.

Mr. Wilkinson.—In May 1877, when the famine was at its height, the number of persons employed on relief works under civil officers in the sub-division of Salem was about 20,000 per diem. I believe a number of persons were also employed under the Department Public Works, but information on this point was difficult of attainment. Allowing 4,000 to have been employed by that department, which is, I feel sure, above the actual number, we may assume that the total number of persons thrown on relief works during the height of the famine was about 24,000, The population of the sub-division as per the census of 1871 was 546,000, so that during the worst part of the famine a little over 4 per cent. of the population were on relief works. The number of persons in receipt of gratuitous relief during the same month was about 30,000.

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* Tanjore district.

† I mean the Kullans proper, not the Maravars or other tribes who are sometimes classified with them. I believe many Kullans emigrate, and, in that case, I am told work well.

Mr. McWatters.—The answer to this question will depend on the system under which the relief-works are conducted. It is to be assumed that the State is responsible for offering the means of support to all persons not able to provide for their own maintenance, subject to such tests as will prevent relief being given to persons not really in want, and will protect the public finances as much as possible. The tests indicated are the distance, wages, and labour tests, and there may be others. In calculating the numbers likely to be thrown on works in an extreme case, it seems to me that the "distance test" is the most potent factor. The experience of the recent famine shows clearly and distinctly that a large class of cultivators and labourers will not leave their homes for distant works. They will travel five or six miles to a work, and return to their houses at night; but further than this they will not go. They draw the line at abandoning their houses. The result of this is that, if a sufficient number of relief-works is opened in each taluk, so as to allow the agricultural poor to repair every evening to their homes, the number likely to come on the works would be very considerable; and, on the contrary, if there are to be a few works only, so that they would have to abandon their houses altogether and live away from their villages, the number likely to avail themselves of work on such conditions would be small indeed, and would consist of local coolies or those residing near the works, and a few strangers from distant parts. It is thus a grave question for Government to decide whether or not this prejudice, or whatever else it may be called, of the poorest class of agriculturists and labourers, should or should not be humoured. They suffer, under their peculiar circumstances, most intensely from famine. It is well know that nearly half of the puttadars or Government tenants pay Rupees 10, and under, as yearly rent to Government. This means in a good year a bare subsistence for a cultivator and his family, in a middling year great stint, and in a bad year poverty and distress. They persistently refuse to leave their houses for works at a greater distance than five or six miles; they cling to their villages until actually driven desperate, and then they seek gratuitous relief in conjee-houses or camps. But by this time their state is almost hopeless. They die on our hands in hundreds. This happened in 1877. Works were comparatively few, and only those within a radius of five miles or so came to them. But, besides being comparatively few, they were of short duration at any one place, and thus relief was given to different sets of people at different times according as old works closed and new works opened, or according as, in the case of roads, the works progressed to a considerable distance. I think also that gratuitous relief was commenced far too late. The famine was ahead of us all the time, and we could never overtake it. Owing to these causes we had over 8,000 people, in a more or less emaciated state, within the limits of the Erode town in August 1877. I have preserved the caste classification of this number, and will enter it for information :—

Caste.	Number on the 9th August 1877.	
	In the Erode Relief-House.	In the Pachiparai Camp at Erode.
1. Vellalars	547	945
2. Vettuvars	268	534
3. Vadugars	125	225
4. Tottiars	35	26
5. Kaikolars	470	520
6. Mussalmans	50	125
7. Valayers	55	35
8. Oddars	140	456
9. Barbers	25	64
10. Kammalars and Carpenters	55	225
11. Pariars	566	700
12. Chucklers	530	655
13. Pallars	10	120
14. Shánárs	136	314
15. Kuravers	44	60
16. Christians	40	52
	3,096	5,056

I think that nothing could be more instructive.

The first three castes are owners of land themselves, or labourers attached to owners of land. No. 4, or tottiars, are carriers of firewood. No. 5, or kaikolars, are weavers. The distress amongst this class was particularly severe; so also amongst No. 8, or the oddars, who are usually the best workers. They refused daily wages and desired piece-work. Among the pariars and chucklers a great many are generally attached to landholders. Both these classes are very difficult to deal with. The majority of these, especially of the chucklers, are as obstinate about quitting their villages as the owners of land are. When the order of the 24th September 1877 was enforced, and closed camps took the place of open conjee-houses, and those selected from the conjee-houses were told off to works, only a few actually went to works, and a great many who went only stayed a few days. A wandering hither and thither thereupon commenced, and ended in the closed camps and hospitals being continually supplied. When the Erode taluk was at its worst I calculated from personal observation that 10 per cent. of the population were receiving State aid of one kind or another. I think that, if works were sufficiently numerous and commenced opportunely, this number, at the least, would be thrown on relief-works in an extreme case. The number for the district with its one-and-three-quarter millions of population would be 175,000.

If works are so sparse as to entail abandonment of homes, the number would not exceed 50,000.

The largest number receiving relief at any one time in the recent famine was over 240,000.

Two hundred and fourteen thousand were receiving gratuitous relief, and only about 26,800 were on works.

Forty-five thousand were on works under the working of the order of the 24th September 1877, while at the same time there were over 12,000 receiving gratuitous relief.

The works, however, were comparatively few, and afford no clue as to what the number of people would be if the works were sufficiently numerous to virtually oust the distance test. The number of puttahs in the Coimbatore district was 233,183 in Fasli 1284. I have calculated that there are on an average $2\frac{1}{2}$ puttahdars to a puttah, but I will take only two. The total number of puttahdars would be 466,000. Half of these, or over 200,000, pay 10 Rupees kist and under to Government.

I merely mention this to show at a glance that my estimate of 175,000 is far from overdrawn.

My ideas now about relief are something of this sort:—

I think that the distance test should, as far as possible, be abandoned. Works, so far as it is practicable, should be opened at an early stage of the famine, and be so sufficiently numerous * as to enable all seeking this kind of relief to return of an evening to their homes. This would provide for all the able-bodied.

The wages ought to be somewhat under normal rates,† and constantly regulated by the ruling prices. The tasks should be the normal asks of the district. Piece-work might be given to oddars. The advantage or disadvantage of piece-work depends on the nature of the task set. If the task is severe, piece-work will be so far disadvantageous, and probably not much undertaken.

Personal appearance should be more looked to than it is in judging of fitness for relief, at all events to the extent of at least suggesting local inquiries. The people most worth protecting in a famine are the cultivators and their able-bodied labourers, and under the above scheme the Government would have no necessity for looking after the old, the infirm, and children of this class.‡

In regard to gratuitous relief I think that the best way would be this gratuitous relief should be started early, at least at the same time as works.

For this purpose villages should be grouped in circles or parishes according to their size.

A closed camp, having regard to caste distinctions, should be erected at a central place in each circle, and all unable to work at the beginning of a famine from whatever cause should be allowed admittance. Those who do not accept one or other of these systems of relief should be left to themselves. With regard to the nature of gratuitous relief I think it should be given by tickets and in the form of raw grain with vegetables and condiments in ordinary years, and, if necessary, in a time of famine, as cooked food or bread. There will be no difficulty in establishing a camp bazaar for the purpose.

I hazard the above suggestions in regard to gratuitous relief because I think this country is drifting into a state when an organised poor law will become necessary, and because I think it would be easier to work a famine if we have existing circle or parish poor-houses.

There is a way open now for making a beginning. It is contemplated to attach and reappropriate all the temple endowments which have been so shamefully embezzled since Government abandoned the management of the temples to local committees and trustees. A portion of the endowments should be devoted to only what is absolutely necessary for the temple worship; judging from all that is appropriated to that purpose now, a very small sum indeed would be found sufficient; a second portion might be devoted to education, and the remainder to the erection of circle poor-houses.

During ordinary years each circle should be made to provide for its own poor, and in times of famine the Imperial Government should come to its assistance. The management of each poor-house might ordinarily be entrusted to guardians nominated by the circle, the institutions being under the general supervision of the collector.

Mr. O'Shaughnessy.—The famine of 1876, 1877, and 1878 in certain districts of this Presidency is as extreme a case as need perhaps be considered. The greatest number of people, exclusive of immigrants, on relief-works in this district at one time in this famine was 79,168, or about 5½ per cent. of the population. The greatest number receiving relief of *all* kinds was 224,735, or 16 per cent. of the population.

The second part of this question is too large to be answered in this hurried report.

Majors Mead and Pennycuick and Captain Awdry.—It may be considered highly improbable that any future famine will greatly exceed in severity that which has just passed, and during this the maximum numbers on the works were 70,000 in Salem and 44,000 in Coimbatore. It is probable that these numbers might have been increased if greater care had been exercised in the distribution of gratuitous relief, but it is impossible to offer a trustworthy opinion upon this point. It is not thought possible to settle beforehand the order or extent to which relief-works should be taken up; the question is one that must be settled when occasion arises.

Lieut.-Colonel Prendergast.—It may be anticipated that 10 per cent. of the population will be thrown upon relief-works. In the case of a work of magnitude, such as the Buckingham Canal, the estimate may be prepared in sections for certain lengths according to the cubical content and section of the work to be executed. A section of the estimate may then provide work for 10,000 people for six months, or 20,000 for three months; and according to the expected intensity and duration of the famine pressure one or more sections of the work will be put in hand.

Lieut.-Colonel. Hunter.—The number during the last famine is said to have averaged about 35 destitute people wanting relief from work to each square mile of area; the commencement of projects, supposing that a sufficient number are ready, should start from the taluks most affected.

Major Vibart.—The numbers thrown on the relief-works during the late famine may, I should think, be taken as the number likely to require work in an extreme case, as we are not likely to have famine in a worse form than from 1876–1878. The greatest number on relief-works in Trichinopoly was 14,521, and the greatest number relieved gratuitously was 7,843.

To enable the Government to ascertain what works they should select from the scheme, each work entered in the list should have placed opposite the number of men and women who would approximately be required to complete them.

Mr. Traill.—During the late famine, the numbers on relief-works rose to nearly 120,000 in the four taluks of this division, or about 33 to the square mile. A sufficient number of works should be fixed upon in each taluk, and two or three could then be commenced simultaneously in each,—giving the preference to the largest and most important.

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* Or if this is found, in practice, impracticable, there might be one work for each circle of seven miles' radius, say, kept going on continuously throughout the famine period.—G. McW.

† *E.g.*—If in ordinary times a man's wages is three annas a-day, when the average price of cholum or ragi, or whatever the staple grain is, is say 12 measures the rupee, I would fix the famine wages at a little less than three annas, and increase it as the price of grain rises. If task work on roads, the principal kind of relief-work available in this district, could be properly exacted, which experience has proved is well nigh impossible, I would be liberal in the matter of wages; but there must be some check.—G. McW.

‡ It was notorious during the recent famine that many able-bodied persons who could have tided over the famine without State aid came upon the works when the works were near their homes—particularly relations of the village headmen. There is no way of eliminating these except by inspection and inquiry. —G. McW.

QUESTION 7.—SHOULD THEY INCLUDE WORKS OF DOUBTFUL FINANCIAL VALUE.

CH. IV. QN.

Should the works include only such as had been sanctioned for construction under the regular rules on such subjects, or would it under any circumstances be right to include in such a scheme large works to which sanction had not been given on account of their doubtful financial value, and their not being of a character that would justify their execution under ordinary circumstances? How far might there be risk of the Government being led into unprofitable expenditure in the completion of works of this sort begun under plea of famine pressure?

SUMMARY.

Authorities are divided on this question. Some would absolutely exclude all works of doubtful financial value. Those who would admit them are alive to the danger of wasteful expenditure, though in Bengal the chief engineer is of opinion that with proper care and foresight the risk would be small.

PUNJAB.

PUNJAB.

General Maclagan.—It would be right, under two conditions, to include among the means of furnishing employment in famine time large works which had been set aside on account of their doubtful financial value: (1) if the works are specially suited, from their nature and position, for providing employment of the kind required; and (2) if they are works likely, when completed, to be of great general or special usefulness.

In speaking of a work as of doubtful financial value, a work which should be of the remunerative class is implied. It is one from which after completion there is to be some income, but of which the anticipated income is too little to give a good return for the initial and current outlay on it. By this circumstance it would be reduced towards the condition of an unremunerative work, and would still be above works altogether unremunerative, like metalled roads, which are costly in first construction and maintenance and yield no return in money. A work of doubtful financial value should not, on that ground alone, be absolutely rejected. The Government cannot go on in an unlimited way constructing works which should be remunerative and are not. But famine demands should not be debarred from taking advantage of such works if they fulfil the two conditions above mentioned.

Works of the other kind noticed in this question, works which are not of a character that would justify their execution under ordinary circumstances, works which are not wanted, and would not be proposed except for the special purpose of providing the people with employment,—even such works it may be right to take in hand under the pressure of extreme distress. The execution of such works may be sometimes necessary, but, as they would only be taken up when no works of recognised utility remain available to which the people could be sent, they should not be deliberately included in a scheme of works proposed.

There is undoubtedly risk of Government being committed to further expenditure for the completion of such works commenced in famine time. But the course to be followed would depend on the circumstances of each case, and the expenditure need not be always unprofitable.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. Sells.—I am of opinion that a scheme of relief-works cannot be restricted to works which promise to bear good fruits in a financial point of view. Utility should certainly always be looked to, and no absolutely profitless, or rather useless, work should find place in such a scheme; but there are many very useful works which may never bring a farthing into the exchequer. This is the case with the construction of a good many roads, which, however they may benefit the people resident in the district, can scarcely be expected to affect the State funds, even in the most indirect manner. Famine may be regarded as an abnormal state of things, and abnormal measures will always, it may be said, be required for its relief. As a rule, I should say that the most unprofitable works, in a pecuniary point of view, are likely to be best suited for the relief of a starving population. Very few paying works can be executed without a considerable expenditure of skilled labour, while those that suffer most from pressure of scarcity form the most unskilled portion of the aggregate population. It is possible, therefore, that Government may be led into expenditure financially unprofitable, but in such a case it seems questionable whether pecuniary gain is the main thing to be looked to. I should myself say, most decidedly, *it is not.*

Mr. Plowden.—I think if the system were adopted throughout of assigning to each project its position in order of utility and financial results, there would be no necessity for including in the series any works which had not been sanctioned for construction under the regular rules.

For instance, take the case that is put in the question, the advisability of undertaking as a relief-work a large project to which sanction had not been given on account of its doubtful financial value, and of its not being of a character that would justify its execution under ordinary circumstances.

This work would, in the system I have supposed, come the very last on the series of schemes kept up for famine-relief works, and would not therefore be undertaken till all others before it were in hand.

There would be no risk of Government being led into unprofitable expenditure under plea of famine pressure, as there is no question that, given the money, there are quite enough schemes which might be projected for the opening up of the communications of the country, or for increasing its system of irrigation, on which it would be profitable to employ all the labour likely to seek for employment in times of famine.

Bengal.

BENGAL.

Col. Haig.—If severe drought, calling for the employment of labour on a very large scale, and in an exceptional manner, occurs at comparatively long intervals, it will be extremely difficult to arrange for suitable projects ready for execution when relief measures become necessary. An irrigation scheme, which might be very suitable now, might, and probably would, be either useless or of little value 20 years hence, smaller and more directly remunerative works having been carried out in the meantime. Unless all ordinary expenditure upon moderate and well-considered schemes is to be stopped, it would be very difficult to say what works would be really suitable for construction in a famine 15 years hence. The probability is, as already said, that the works would be found to have been superseded when the emergency arose, and the whole of the money expended in the preparation of plans and estimates thrown away. In any case, I should say, such schemes should include only such works as had been sanctioned for construction under the regular rules. To admit works for which such sanction had not been given on account of their doubtful financial value would be to open the door to unlimited waste. But as sanction under the regular rules is only accorded to projects shown to be financially sound, why defer their execution till a famine occurs, when they will cost three times as much as if done in the ordinary course? In special reply to question 6, I may note that it would be easy to attach to the estimate of any work a statement showing the quantity of earth-work in each section of it, and the number of labourers probably required to execute it in a given time. This would be a guide in the selection of works for relief to meet the wants of any particular time of pressure.

Col. Cadell.—The scheme should, as a general rule, include only such works as have been sanctioned or appointed.

With proper foresight and the preparation of approved projects in advance, there should be little risk of Government being led into unprofitable expenditure in completing works commenced under the plea of famine pressure.

Bombay.

BOMBAY.

Colonel Anderson.—I would absolutely exclude all works of doubtful financial value. There is always plenty of work to be done of no doubtful necessity or utility.

Madras.

MADRAS.

Lieut.-Col. Mullins.—Whenever relief-works become necessary those which are the most likely to prove useful and valuable would naturally first be selected for execution, and afterwards others of a less promising description. In all cases projects should be completely worked out, and their character, whatever it may be, ascertained, before they are sanctioned for execution. This is essential, and it follows that to have to commence investigations after the need of relief-work has arisen is very undesirable. The risk of unprofitable expenditure will always be present to a greater or less degree with regard to all works the results of which are contingent on many circumstances which cannot be conclusively ascertained beforehand; but, on the other hand, the certainty of unprofitable expenditure when employment for crowds of people is wanted, and is not available, is absolute; and it would, during the famine of 1876–78, have been infinitely better had unpromising works been taken up instead of in many parts of country having no work which could be of value for the labourers to do. Not only was no good work sometimes done, but work which made the state of the country as regards its roads worse than it was before; so that more money will have to be spent in undoing what so much was spent on doing. No work need under proper arrangements be taken up which will not at least be of material advantage to the country when completed.

No work of magnitude need be undertaken without a reasonable probability that when relief operations cease its value will be at least equal to the cost of its completion.

Major Montgomerie.—For the answer to the first part see the answers to Nos. 3 and 4. Under proper management, no scheme of irrigation which will not at least be of material benefit to the country need ever be commenced as a famine relief-work; and no large scheme of doubtful remunerativeness without a reasonable prospect of the work being so far advanced at the cessation of relief operations that its completion would pay.

Colonel Foord.—On no account should works other than those sanctioned under the ordinary departmental rules be sanctioned as famine relief-works. The risk of Government being led into unprofitable expenditure in the case of very large schemes that have not been thoroughly considered in all details is so great as almost to amount to certainty. The risk is, of course, less in small works than in those of great magnitude.

Mr. O'Shaughnessy.—Work sanctioned under regular rules should be taken up for famine relief in preference to other works. Unsanctioned works should then be taken up, if necessary, in the order of their remunerative value. Works of a remunerative nature, and which are not likely to be executed in the "ordinary course," will be available in this district for any famine emergencies that may arise during probably the next 100 years to come. Government are more likely to be led into unprofitable expenditure by the incapacity of its advisers and agents than by any want of remunerative works to be carried out.

Major Mead.—Has already been partially replied to in the answer to No. 3; it is not supposed that waste can altogether be avoided; but the more carefully the schemes are prepared, and the more thoroughly their execution is supervised, the less will be the risk. Present experience seems to show that there is far more danger of waste from the non-completion than from the completion of works begun for relief purposes.

Lieut.-Colonel Prendergast.—I consider that works must be undertaken that the Government would not be justified in executing under ordinary circumstances, and that there must be expenditure that is unprofitable with reference to direct returns. Much, however, may be done that will be of considerable utility and of immediate advantage to the people, such as in opening out roads and canals, while the repair of irrigation works arrests deterioration, maintains existing revenue, and puts off the time when expenditure from ordinary funds will become necessary.

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Madras.

Mr. Traill.—Many ofthe works which would have to be taken up would not be sanctioned by Government in ordinary circumstances. Most of them, however, would be useful, although yielding no direct return—road-works (repairs), for instance.

Ch. IV. Qn. 8.

Question 8.—Value of Unskilled Labour during Famine.

Is it probable that the amount of work executed by unskilled labour on any large work during the pressure of famine would be such that the exclusion of the expenditure on it would reduce the ultimate cost of such a work in any important degree, so as to be likely to render it remunerative, though, if otherwise executed, it would not have been remunerative. Can any illustration be given of such a case as that last referred to?

SUMMARY.

Those who do not regard the proposition as fallacious are for the most part of opinion that the exclusion of the cost of unskilled labour during famine on an unremunerative work would lessen the cost of the subsequent completion of that work to an extent which would render it remunerative.

PUNJAB.

Punjab.

General Maclagan.—It is conceivable that the exclusion of the payment for the unskilled labour employed on a work in time of famine might so affect the relation of the apparent cost to subsequent income as to make it appear remunerative; but this would merely be a defective and fallacious account. No illustration can be given of such a case.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Colonel Brownlow.—Under provisions of resolution of Government of India in Financial Department No. 2531, dated 11th December 1877, the cost of all famine-relief works is, in the first instance, to be recorded under a suspense head in the accounts of the Public Works Department. This suspense head is eventually to be cleared by charging to the Public Works Department the real value, at normal rates, of all work done, and the transfer to head of famine-relief of all expenditure, in excess of normal cost of work, due to want of skill and strength in labour employed. Under this rule the amount of unskilled labour employed on a work would not in any way affect its cost at normal rates.

Mr. H. B. Harington.—To answer this question some individual scheme should be presented for consideration, and I am acquainted with no such scheme. That a large work, in itself unremunerative, should be made remunerative financially by the mere fact that a part of it was executed as a famine-work, and that by excluding this portion of its cost the total cost of construction was, as a matter of account, so (technically) reduced as to make it a remunerative work, might, under certain circumstances, be possible, though very far from probable. If the selection or rejection of such a work were made to depend on mere financial results, it would, I think, be well to let it alone.

It might, however, well be that a work of general utility had hitherto been let alone because not likely to be financially remunerative, that no financially remunerative work could be substituted for it, and that its execution was the best means of saving life.

To reject it because unremunerative would be to neglect a recognised duty, and to forego a possible advantage, whilst to pretend that the reduction in cost might make it financially remunerative would be waste of ingenuity and time. The justification of the work would not rest on its financial value; and the only use of deducting, as a matter of calculation, its cost as a famine-work, would be to answer objections not perhaps worth the trouble of answering. No quibble in accounts will make an unremunerative work remunerative, or afford grounds for rejecting a work in itself of general utility and the best means of securing the end in view. If skilled labour cannot make the work pay, it is clear that unskilled labour will only make it more costly. Whether the extra cost should be incurred as the only available means of saving life is the real point at issue; and any financial jugglery that keeps this point out of view seems worse than useless.

Mr. Wall.—I think not probable. Relief-work labour is of course inferior to ordinary paid labour; the hands are weak and many of them unused to labour, but the wages are to some extent proportionately lower; and the quality of the labour tends to improve after a little time, as the paupers become better fed, stronger, and more expert.

I have not got the necessary papers to refer to, but I think a portion of the earthworks at Bánda, during the scarcity of 1874, was done as cheaply, if not cheaper, than the same work could have been done by the Public Works Department in ordinary times; but then, towards the close of the Bánda relief operations, I gave no money wages, only food, and that of the cheapest kind, viz., mahua (*bassia lotifolia*) daily, with a flour ration once a week.

I sent full particulars of my Bánda famine administration to the Secretary, Famine Commission, some months ago, while officiating judge at Gházipur. I kept no copy.

Mr. Watts.—Yes, I can conceive readily cases where, at the beginning of real pressure or towards the end of it, when prices were not so ruinously high, and the daily wage were regulated accordingly, a large number of able-bodied men and comparatively hearty women might be put on to a work, *e.g.*, a railway cutting or embankment, or the raising of a road, on which they would only be earning 1½ anna (or 1¼) and one anna a day each respectively. Well controlled, such cheap labour might still be most effective; and thus a work that it would not have paid to execute by ordinary labour, in ordinary seasons, might, from its initial cheapness, prove remunerative enough in the long run.

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NORTH-WESTERN PROVINCES.

But it would be much more difficult to carry out any work of this kind with labourers drafted from poorhouses; at least, my own experience is that, partly from weakness and partly from lazy independence (chiefly the latter), it is very difficult *for some time* to get these people to do any real hard work.

Mr. Kennedy.—The work done by ordinary relief gangs in this district has not been expensive. If children in arms are excluded, it has cost over Rs. 1–12–0 per 1,000 cubic feet on the Kant and Madnapur relief-work, the work at present in progress. The work done by the indigent gangs who form about one-sixth of the whole is, of course, expensive, and amounts, roughly speaking, to about Rs. 4–3–0 per 1,000 cubic feet. The ordinary rate for the work would have been Re. 1–8–0.

Mr. Sandys.—No large work has been executed in this district during the recent pressure which will be remunerative in any way.

At the rates now paid to the efficient gangs the Mahawa bund could be constructed at, I think, for two-thirds, if not half, the cost which would have to be incurred in ordinary times, and the zemindars of the villages, whose lands would be benefited by it, would willingly repay the whole outlay, with 6¼ per cent. per annum interest, in five years.

BENGAL.

BENGAL.

Colonel Haig, R.E.—The question is, whether the amount of work executed by unskilled labour on any large work during the pressure of famine would be such that the exclusion of the expenditure on it would reduce the ultimate cost of such a work in such a degree as to render it remunerative, though, if otherwise executed, it would be unremunerative. I should say almost certainly not; the only work that could be done by famine labourers would be earth work, and that they could not complete, so that it would have to be finished off afterwards by the ordinary contractors, who would necessarily charge much higher rates than if they did the whole work. Besides, the earth work seldom exceeds a third of the whole cost of a work even in canals.

Colonel Cadell.—It is not probable that the exclusion of expenditure on work executed by unskilled labour on a large work during famine pressure would so reduce the cost as to render it remunerative when it would not have been so otherwise, but no illustration can be given of such a case.

BOMBAY.

BOMBAY.

Mr. Hughes.—Yes, in almost every instance. In illustration of a case of the kind referred to, I may cite the Shirsuphal tank in the Poona collectorate. The estimated capital outlay on this work is as follows:

A.—Direct Charges.

	Rs.
I.—Works - - -	1,51,860
II.—Establishment - -	37,965
III.—Tools - - -	2,861
Total A, direct charges -	1,92,686

B.—Indirect Charges.

Capitilisation of abatement of land revenue on land taken up for the work - - - -	5,000
Leave and pension allowances -	7,593
Interest on outlay during construction - - -	4,178
Total B, indirect charges -	16,771
Grand total, A. + B. -	2,09,457

The annual average net revenue is estimated at Rs. 5,255, or 2½ per cent. on the total capital outlay.

The value of the work executed during the famine is Rs. 96,220.

If this is deducted from the estimated total capital Rs. 2,09,457, it leaves a balance of Rs. 1,13,237, on which a revenue of Rs. 5,255 would give a return of rather more than 4·6 per cent., and would thus convert a work which if it had been executed otherwise than as a relief would not have paid the charges for interest on outlay into one that would pay rather more than the rate of interest at which money can be borrowed.

The above is on the assumption that the charges other than the direct outlay on works would remain unaffected. If, however, it is assumed that the work is treated solely as a relief-work until the cessation of the famine, and it is not debited with the establishment and other charges on account of famine outlay, the result would be still more marked. Thus in this case, assuming the capital account to be framed after famine-work to the value of Rs. 96,220 had been executed, it would stand as follows:

A.—Direct Charges.

	Rs.
Works - - - -	55,640
Establishment - -	13,910
Tools - - - - -	1,113
Total A, direct charges -	70,663

B.—Indirect Charges.

Capitulation - - -	5,003
Leave allowances - -	2,782
Interest, say - - -	1,000
Total C, indirect charges -	8,782
Total A. + B. -	79,445

on which a revenue of Rs. 5,255 would give a return of nearly 6¾ per cent.

On this basis also the Ashti tank in Sholapur, which the Government of India estimate may in the course of years return a net direct profit of from 3 to 4 per cent., would become a remunerative work if the value of work executed during the famine were excluded. The estimated capital outlay on this work is Rs. 7,98,938, of which Rs. 5,55,418 is for works. The value of work executed during the famine is Rs. 1,46,419, and, excluding this, the total capital would be reduced to Rs. 5,92,339, as follows:—

A.—Direct Charges.

	Rs.
Works - - - -	4,08,999
Establishment - - -	81,800
Tools - - - -	8,180
Total A, direct charges -	4,98,979

BOMBAY.

B.—Indirect Charges.

Capitulation	12,000
Leave allowances	16,360
Interest	55,000
Total B, indirect charges	93,360
Total A. + B.	5,92,339

A revenue which would give a return of 3 to 4 per cent. on Rs. 7,98,938 would give a return of from 4 to 5½ per cent. on Rs, 5,92,339, or about the rate at which money can be borrowed.

MADRAS.

Lieut.-Colonel Mullins.—This question has been partly answered above. It must be a matter of judgment what magnitude of work may advantageously be taken up in a given locality. It will depend upon the circumstances, and in a great measure upon the weather, the character of which latter cannot be predicted, what proportion of any large work will be completed before distress comes to an end. One or two or three monsoons may fail. When the first fails some distress may have to be met, and it may be provided for by several small or one large work. Whether the next and the next monsoon will or will not fail cannot be determined beforehand, and many considerations would have to be taken into account in deciding whether large or small works would be the best for the intended purpose. Among these considerations would be the numbers to be relieved in particular localities, facilities for feeding the labourers, the need of permanent improvements, the effect on existing works of irrigation of one or other of the available schemes. For instance, a reservoir on a river might promise much advantage to the irrigation supplied from the river, but it may have been found that the financial results would not justify under ordinary circumstances more than half or two-thirds of the required outlay. With a probability of half or one-third of the work being done by famine labour such a scheme might be preferable to several small works.

The Upper Bellary project for a canal from the Tungabhadra to Bellary is a case of a large project which might with great advantage have been taken up directly it had been ascertained that large numbers of labourers would need relief. It would have been practicable to get work of the value of 50 or 60 lakhs done by famine labour, and about an equal sum would have been needed to complete it. An adequate return on the whole cost would be improbable, but it would have been well worth while to complete it. Labour representing much more than the first 50 or 60 lakhs has been supported without any useful result.

Major Montgomerie.—The answer to this question in a great measure depends on the definition of the term unskilled labour—

(*a*). If it is used in its ordinary sense, in contra-distinction to skilled labour, and such labour is intelligently employed, the amount of work performed and its remunerativeness will simply depend on the duration of the famine and the nature of the scheme selected.

(*b*). If the term is applied to the method of employing labour in force during the later stages of the Madras famine, when all, whether able-bodied or not, have first to be reduced to one uniform level of destitution, and no more than a moderate task is accepted, then the amount of work performed will necessarily be much less, and the chances of its remunerativeness proportionately reduced.

(*c*). And if by unskilled labour is intended the work that can be performed by that class of the population which are unaccustomed to manual labour, the amount of labour done (*although by careful management it may be appreciable*), would hardly be worth taking into account in the selection of a scheme for famine relief.

Colonel Foord.—The exclusion of the amount paid for famine labour on a work would, no doubt, in many cases, so far reduce the cost as to make it profitable. Thus, supposing an irrigation scheme, comprising an anicut with channels and masonry works, had been for some time in abeyance because the anticipated returns were not considered sufficient to justify the outlay; then, if all the earthwork of the project were carried out by famine labour, the returns might be a fair per-centage on the outlay for the masonry works. But this is a mere manipulation of accounts.

Mr. Walch.—There can be no doubt, though I am unable to give an illustration, that many works which under ordinary conditions would be unremunerative would appear to be remunerative if all the work on them not requiring skilled labour were done by famine coolies, and the cost not charged to the works, but of course this would be a mere matter of appearance.

There are in the Presidency some already matured projects suitable for the employment of famine labour, such for instance as the "Sungam project" in the Nellore district, but which have not been of a sufficiently alluring character to lead to their construction from borrowed capital, as was intended, and these works would of course stand first on the list in the general scheme; but it must be accepted as inevitable that of that scheme many, if not most, of its component parts will offer no prospect of direct profit, but will come into the category of works of "doubtful financial value." More should not be expected than that works should be provided well suited to secure the immediate object in view, and which will prove of benefit to the community at large, or to considerable portions of it, so that some good may be brought out of evil, and a total loss of the labour and money expended may be prevented. For instance, the completion of the river embankments in the deltas of the Cauvery, the Godavari, and the Kistna to such heights and sections as will place them beyond fear of being breached in the highest floods that can reasonably be expected would, though not directly remunerative, be most excellent famine-works, as being of benefit to the whole community in putting into safety from a now threatening danger many hundreds of thousands of acres of grain cultivation, and because these works would lie in parts of the country which usually have surplus stocks of food grains, and to which the transport of the labourers and of food is easy. The construction of the "Grand Trunk Road," now only a road in name for the greater part of the way, through the Kistna and Godavari districts; the construction of a railway from Bezwada to the Hyderabad frontier to join there a line from Hyderabad, which it is believed the Nizam's Government would then carry out; the excavation of a canal from the Cocanada River to opposite the anchorage of that part; may also be named as examples of what good famine-works would be. These examples have naturally been named from among many others which suggest themselves out of the districts with which I am, or have been, connected, and doubtless every Public Works Department officer of any experience could supply a list of works of con-

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MADRAS.

siderable magnitude in his district on which famine labour might be usefully employed in fair healthy localities and tolerably easy of access. These two last conditions I take to be very necessary ones for such works. Out-of-the-way works, to which it is difficult to transport labourers and food, or which lie in more than ordinarily unhealthy localities, however tempting in other respects, are not suitable to employ famine labour on. For instance, the boat canal from Bhadrachalam to Dumagudem, on the Upper Godavari, lately proposed as a famine-work, is, I consider, very unsuitable for the purpose, except in connection with any famine in its immediate neighbourhood, because it is difficult of access, and is in a place scourged with fever during several months in the year.

Mr. O'Shaugnessy.—It is not only probable, it is *certain*, that many works that are now put aside because they are not expected to yield a minimum amount of interest on expenditure would be highly remunerative if the value of work done by famine labour were not taken into account in the calculation of interest.

For example.—The Sungum project in this district, which is referred to in answer to Question 3. The Madras engineers calculate that it can be completed in five years in the ordinary course; that it will cost 27 lakhs of rupees, and that it will yield an increase of revenue of 8 or 9 per cent. on the outlay. The engineers of the Government of India assume that it will cost 43 lakhs; that the work cannot be done in less than seven years; that the increased revenue would not be obtained until 20 years after the work were commenced; that by that time it would cost, including interest, 80 lakhs; and that the increased revenue would not pay the current interest on the *capital* that would be expended upon it. The Government of India have time after time, by such advice and on the strength of calculations that are founded on mere assumption, refused to give the necessary sanction to this project, which, if commenced eight years ago, as desired by the Government of Madras, would have saved the lives of hundreds, if not thousands, of people, and have saved lakhs of rupees to Government during the past two years by having made a large population independent of famine relief. Out of the total estimate of 27 lakhs, work to the extent of 16 lakhs was eminently suitable for the employment of famine labour. If the work had been carried out to this extent during the past two years, the work remaining to be done would cost 11 lakhs; and if only this amount were debited to the work, it would yield about 22 per cent. per annum in increased revenue; work to the extent of 16 lakhs could and would have been carried out on this project by relief labour during this famine, but the Government of India would not, it is supposed, allow it to be undertaken, though, it is believed, pressed to do so by Sir Richard Temple, as well as by the Government of Madras. Many similar instances could, no doubt, be given in which the obstructive advice of Bengal officials has frustrated the efforts of Madras officers, and has caused grievous injury to the people and immense loss to the revenue of this Government.

Major Mead.—Not understood; nine-tenths of the cost of any work of the class contemplated will always be for unskilled labour, and the exclusion of this nine-tenths will, of course, affect the financial result.

Lieut.-Colonel Prendergast.—I think it is probable that, by the exclusion of the expenditure by unskilled labour on a large work, the ultimate cost would be reduced so much as to render the work remunerative, though otherwise it would not have been so. If earthwork on a new project is estimated to cost a considerable portion of the estimate, this may be expected to be the case. I cannot illustrate this from actual experience, but I conceive it is a fact in works such as the Buckingham Canal, the railway from Conjeveram to Chingleput, the Bellary-Hubli Railway; for if the deduction of the value of unskilled labour would not actually make the works remunerative in the direct form of a fixed per-centage, though diminished cost might turn the scale whether the work should be undertaken or not. On the Kaveripak Main Channel from the Palar anicut in North Arcot the channel was improved and widened for three miles, and two masonry drops were built there; by far the greater portion of the expenditure was incurred by famine labour. There was no direct remuneration to be obtained, as additional land was not brought under cultivation; but, by excluding the expenditure on unskilled labour, great results have been obtained for the outlay on the two masonry drops.

Lieut.-Colonel J. W. Hunter.—If no subsequent charge were made against the ordinary heads of expenditure for work done by famine labourers, such work would be undoubtedly remunerative; but the practice has always been to charge the normal value of such work to ordinary heads of expenditure and the balance to famine. In the case of the flood banks of the Cheyaur, the work was done by famine labour; then an estimate made as to what it would have cost at normal rates; this was charged to ordinary irrigation and the balance to famine. Had ordinary irrigation been presented with the famine out-turn, the result would certainly have been remunerative.

Major Vibart.—It is certainly possible to imagine works which, executed in the ordinary way, would not be remunerative, but from which, if work executed by unskilled labour on it, during famine, was excluded, would pay. To the east of the Udiarpolliem taluk there are the remains of a very large tank which received its supply from the river. This would, perhaps, be remunerative if restored, but if the cost of famine labour were cut out I should imagine there would be no question that it would but pay.

H. IV. Qn. 9.

QUESTION 9.—SHOULD LARGE WORKS NOT SANCTIONED BY PROPER AUTHORITY BE INCLUDED.

Could large works not sanctioned by proper authority, for whatever reason, be properly included in the scheme of works, and if so, what preliminary steps should be regarded as requisite before actually putting them in hand if severe scarcity arose?

SUMMARY.

Those who are not opposed to the execution of such works assume that plans and specifications and an estimate of their utility have been prepared beforehand.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—I think it would be very dangerous to authorise commencement of unsanctioned works of importance for purposes of famine relief. The preparation of a scheme of works for future use implies careful consideration of probable cost, and remunerative character of each work; and if these features have been determined with reasonable accuracy, there should be no difficulty in obtaining the decision of the proper authority as to whether the work may or may not be executed for purposes of famine relief.

Mr. Sells.—I presume that the local government could at all times sanction the setting on foot of any "large works," and I apprehend that there would in no district be so very sudden a call for *large* works as to make it impossible to await Government sanction, presuming that on emergency that sanction can be accorded without the intervention of any great formalities. A coming famine must always, I should say, cast its shadow before it, and the cost of any vast works might, I think, be easily estimated, approximately at any rate, before it would be absolutely necessary to put them in execution. My own view is, that as soon as prices reach such a height as betoken severe pressure upon the poorest classes—and practically it would not be difficult to fix this point—"test" works of the easiest sort of labour, raising roads, for instance, filling in large ponds, such as almost all large towns have round them, &c., should be opened, at subsistence wage. These would act as a safety-valve, and would, at the same time, be a gauge of the demand for work. Some discretion should be allowed and the expenditure of funds be sanctioned liberally, and the manner of executing the works, and decision as to the method of payment, should be mainly in the hands of the district authorities, except where the works are carried on by purely distinct departments, as, for instance, extension of canals and drainage lines. The suggestion of schemes should devolve separately upon—(1) the district authorities, and (2) the Public Works Department in its several branches, but the preparation of projects, when once suggested, should rest upon the Public Works Department; and that department should also be responsible for seeing that, in the event of relief-works being required, those works should claim precedence which are most suited to the purpose, and not those which promise the best ultimate results, and would afford opportunity, meantime, for the maturing of more extensive and costly works. And I understand that it is proposed that a list of these should be always kept ready for emergencies, at least so I interpret the expression "scheme of works."

Mr. Sandys.—The construction of—

1st. Mahawa bund,
2nd. Ganges khâdir bund,
3rd. Filling in three deep excavations outside the boundaries of the Budaun municipality,

are large works which may not be sanctioned by proper authority, but which might be included in the scheme of relief-works. Nos. 2 and 3 should only be put in hand as such if severe scarcity arose, and the immediate drafting off of all able-bodied labourers to important works in progress in other districts could not for any cause be carried out.

Mr. Cornwall.—The only preliminary that seems necessary is to have a proper survey of such works undertaken, to ensure that in the haste work should not be done which would afterwards have to be rejected as useless. No work should be commenced before the completion of the survey. I am not in favour of keeping up a separate list of famine projects.

Mr. Adams.—I confess that I do not understand this question. If there be a proper scheme of works, all works fit for the purpose of relief should have been included in it; and apart from the condition considered in my answer to question 7, I can conceive only two cases in which it could be necessary to commence other works, viz., 1st; if pressure occurred before the completion of the "scheme;" 2nd, if the scheme had included only the financially paying works, and that all these had been executed, in which case it might be necessary to employ the people on a work which had not been sanctioned.

Mr. Barstow.—Large unsanctioned works might be included in the scheme, but sanctioned works should take precedence of them. The sanction of Government should be necessary before putting the former in hand.

BENGAL.

BENGAL.

Colonel Haig.—Large works not sanctioned by proper authority should, under no circumstances, be included in a scheme of famine-works.

Colonel Cadell.—Works not sanctioned or approved by proper authority might be included in the scheme of works in exceptional cases.

In such cases approximate estimates should be required, so that the liability to be incurred should be ascertained as nearly as possible without the preparation of the detailed estimates.

BOMBAY.

BOMBAY.

Colonel Anderson.—If proper provision in anticipation of need had been made, there would be no necessity for resorting to unsanctioned works, as a rule.

MADRAS.

MADRAS.

Lieut.-Colonel Mullins.—It would not be difficult to arrange to obtain the approval of the proper authority to the entry in the scheme of relief-works to meet future famines; and if the investigation of irrigation projects be taken up on any systematised and intelligible plan, it cannot be long before there will be many schemes worked out which, while not giving a prospect of adequate returns to warrant their execution under ordinary circumstances, will be of very great use whenever again employment for distressed labour has to be found. There need, it is thought, be no safeguards erected against the putting in hand of any schemes which have been fully investigated and not altogether rejected. What are required are safeguards against the absolute waste of money resulting from having vast numbers of labourers and nothing useful for them to do.

H. IV. Qn. 9.

MADRAS.

Colonel Foord.—This has already been partly answered. If, for any reason, it should be determined to put in hand works not sanctioned by proper authority, then before the work is actually commenced, if detailed plans have not been prepared, every effort should be made to get at least rough plans, specifications, and estimates prepared, to prevent mistakes being made and consequent loss being incurred. The risk is, of course, lessened if intelligent supervision is available.

Mr. Walch.—With a properly prepared scheme, carefully considered and provisionally sanctioned by the Government, ready to hand, there would never be any necessity to commence unsanctioned works for relief; and though, as before said, it is inevitable that many of the works in the scheme would be what is called "unremunerative," there need be no "waste," in the proper meaning of the word; waste and loss of life there certainly would be, as there has been, if no such scheme were ready.

It will not do, experience has proved it, to leave such a vital matter to be dealt with haphazard, when the emergency arises, without any special previous provision. Delay, confusion, and the waste must be the result of such unreadiness. The preparations to combat famine in India should be kept in order in times of plenty as carefully as the preparations for war are maintained in the times of peace. It is notorious that for want of such preparations the commencement, at all events, of the recent famine campaign was disastrous.

Mr. O'Shaughnessy. — Unsanctioned works and works that would not be sanctioned in the ordinary course, because of their unremunerative character, and because they would not, though even of considerable use, be considered worth their cost, could be included in a scheme of famine-works. The only preliminary step that seems requisite before putting them in hand would be to classify them according to their relative remunerative value or importance, and to take them up accordingly.

Major Mead.—See answer to No. 4. All works should, if *possible*, be properly considered and regularly sanctioned beforehand; but if no regularly sanctioned works are available, unsanctioned ones must be taken up. Rules must give way to emergencies.

Lieut.-Colonel Prendergast.—Large works not sanctioned by proper authority may be included in a general scheme if the project has been well considered, its general features determined, and if there remain only minor details to be worked out. Thus, supposing for the extension of the Buckingham Canal southwards, through South Arcot and Tanjore, if levels have been taken, if the line has been surveyed and laid down on a plan, then orders might be given for commencing work; for as the project has been already accepted, as of benefit to the country and suitable for the employment of relief labour, the estimate is not really of consequence. The work has to be done, and the commencement in anticipation of sanction to a definite sum will not affect the outlay. There will still be much to be done in drawing out plans for the masonry work for bridges where roads cross, and in the way of providing for cross drainage; but with a sufficient executive staff this work can be carried on at the same time, and the estimate may be drawn up in parts for sanction while the earthwork is under execution.

Lieut.-Colonel Hunter.—I think that such circumstances might arise, in which case the urgency of the case might be decided by the local officers in consultation, a report being then made to Government, who would thus have the power of stopping any work that appeared to them ill-advised; experience seems to show that no reliance whatever can be placed on estimates where famine-work is concerned.

Major Vibart.—As a rule, all works placed in the list of schemes of work for future use should be sanctioned by proper authority, and if proper attention is paid to the subject during the next few years the list would be quite complete. Should, however, a famine recur before proper arrangements have been made, large works which have not been previously entered in the scheme of works might be made use of on emergency, but they should be visited by the chief engineer in person (together with the local authorities, superintending engineer, and collector), so as to satisfy himself, as far as possible, that they would be remunerative, or at least indirectly beneficial to the district.

Mr. Traill.—There are no works in this division, in my opinion, which are of such magnitude that, if severe necessity arose, their commencement could not safely be left to the discretion of the divisional officer in consultation with the civil officer in charge. It should, I think, be sufficient that the divisional officer should inform Government what he intended doing, so as to give them the opportunity of countermanding the work if they thought proper. Estimates for famine-works are, in my opinion, of little use, as they are always exceeded, and nobody can be blamed if they are so.

Ch. IV. Qn. 10.

QUESTION 10.—RISKS ATTENDING ABSENCE OF SUITABLE PROJECTS.

Considering the circumstances under which labour is applied on relief-works, is the risk of waste by reason of there being no regularly prepared scheme ready really great? Is there danger, in the absence of suitable projects ready for immediate execution, of the suffering population being left without proper relief until the necessary relief-works have been prepared for execution? How far might the intelligent action of the several branches of the Public Works Department be made to supply, from among projects in course of execution or ripe for it, what was requisite? Could this end be sufficiently secured by distinctly making the Public Works Department responsible for bringing forward suitable works whenever pressure from scarcity arose; and, so far as was necessary and practicable, setting aside or postponing the ordinary work not suitable for relief purposes?

SUMMARY.

The greater number are of opinion that the absence of well-considered schemes would involve delay in affording relief to the population, hasty preparation and subsequent waste. Those who are of the opposite opinion say that there are many ways of employing the people in the early stages of famine during the preparation of special schemes, and that ordinary works would serve that purpose for a time. The responsibility for meeting the necessities of the case is divided between the Local Government and the Public Works Department.

PUNJAB.

PUNJAB.

General Maclagan.—With reference to the first of the questions, there is risk of waste in the execution of any work, if it is not estimated in detail and properly laid out before it is allotted to the workpeople. But it cannot be said that waste would be a consequence of there being no regularly prepared scheme of works. The safeguards against waste are provided, if such work that is put in hand for famine relief is systematically dealt with in detail both before and during the construction, though it may not have belonged to a general scheme.

Any large project taken up in haste and put into shape on short notice would be liable to be insufficiently considered and in one respect or other unsuitable. Small works, which, though otherwise not so desirable, are yet often necessary and most useful, can be more readily prepared for relief purposes without risk of waste.

When in any district there are no proposed works of utility of a suitable kind, and the need for such employment arises, then either the people must be passed on under arrangements suitable to the occasion to certain large works elsewhere, or (if for any reason relief must be local) works have to be invented, having no definite purpose but to provide the people with food and some means of earning it; in such a case there is waste in the way of misapplied money, though perhaps no waste in the way of work incommensurate with expenditure. And under the circumstances proposed this would not be prevented by a prepared scheme. It is illustrated in the account of the relief operations in the Delhi Division in 1861, when the Commissioner wrote: "The labour of a vast multitude, "which would have been lost, possibly for ever, was "turned to good account, and many of the works "then made are likely to prove permanently useful." (No. 241, dated 20th November 1861, to the Honorary Secretary, Punjab Famine Fund.)

If no work of any kind can be given to the suffering people, there is of course danger of their being for a time without proper relief, that is, earned relief. To avoid this, the chief thing required is a supply of tools in each district.

How far the action of the Public Works Department might be made to supply, from among projects in course of execution or ripe for it, what was requisite, has been indicated above. But directly, at any particular time, it would depend on the state of progress of the works. For, as before observed, works which are wanted, and for which money is provided, would not be held back in order to form a reserve of employment for the suffering people in some unforeseen future time of scarcity. The Public Works Department could scarcely undertake to have suitable works to bring forward in any particular part of the country whenever pressure from scarcity arose, but within the limits of a province this could be arranged. Only it is to be remembered that the Public Works Department is now a divided department, and the responsibility for suitable works would be divided. The local government has no longer the control of all the works going on within the range of its administration. Provincial general works and irrigation works, though under separate direction, are under the local government's orders, but not military works and State railway works.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—There is to my mind great risk of waste on occurrence of famine where no previously considered scheme of relief exists.* The suffering population would not, in the absence of suitable projects, be left without proper relief, but would be employed on any trumpery useless works which might suggest themselves to despairing magistrates as suitable for employment of the distressed poor. The Madras Government found itself facing famine without any scheme of relief-works, and what has it got to show for its famine expenditure? The Bombay Government had (thanks to Colonel Fife, the Chief Engineer for Irrigation) a number of useful irrigation projects, suited to purposes of famine relief, all ready prepared, and has come out of its famine difficulties with the greatest credit for economical application of its famine labour. I do not think that reliance could be placed only on projects in ordinary course of execution or preparation to afford full relief in time of famine, save under exceptional circumstances, such as the actual excavation of a large canal at the time when, and in the locality where, famine occurred. The local Department Public Works should, of course, be empowered to modify its ordinary programme so as to afford the maximum of relief to the distressed poor; but this programme would not, as a rule, afford sufficient relief of itself, and other suitable projects could only be brought forward for execution in a suitable manner, if they had been well considered beforehand.

Mr. Plowden.—I should say there is little risk of waste by reason of there being no regularly prepared scheme of *work for famine relief;* because there are always other ordinary works for which projects have been prepared, on which at the outset the persons in want of employment might be given occupation.

There would thus be no danger of the suffering population being left without proper relief.

Mr. R. M. Edwards.—No, there is not the least danger of waste, or of the people being left without proper relief, in consequence of there being no suitable projects ready. There are always numerous works available for which administrative sanction has been obtained, and there is neither difficulty nor risk of any kind in commencing them as soon as the district authorities, who are the best judges, see the necessity. They, *i.e.*, the district authorities, should point out the localities where relief works are most urgently required, and the Public Works Department should do everything else.

Mr. H. B. Harington.—The scheme should be now so prepared as to reduce the inevitable risk of waste entailed by famine labour to a minimum.

Whatever that risk be (and it might be considerable), not to avoid what is avoidable would be to convert the risk into a certainty. There *is* real danger of the suffering population being left without proper relief if projects, suitable in themselves, and that should be ready for immediate execution, are yet undergoing the process of having their suitability discovered or discussed, or of going through the many stages along which they have to be prepared for execution. It is not for me to say what "the intelligent action of the several branches of the Public Works Department" might do, or fail to do, under

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* Extracts from No. 1127–1982, dated 3rd August 1878, from Officiating Chief Engineer, Mysore:—"When famine-relief "works on a large scale were started here last September, there "were very few suitable projects prepared or sanctioned on "which to employ the pauper labour. As there was then no "time to lose, it was necessary to begin various works which "appeared likely to be of utility, without previously estimating "what would be their cost. Some of these are large schemes "of which only a portion could be done during the famine"... ...., of these "the entire projects should, according to "rule, be submitted to the Government of India as early as "possible. *But this would involve the elaboration of schemes "which there is no early prospect of carrying out,"* &c.

North-Western Provinces.

the circumstances contemplated. That very much might be done by such intelligent action under sagacious control is too clear to need stating. Whether projects in course of execution or ripe for it would suffice to meet the exigencies of an extreme crisis, would depend on specific questions of detail; and generally on whether schemes under or ripe for execution were still so backward as to make necessary for their completion the employment of the starving population thrown on the hands of Government, and would afford sufficient employment for the starving population.

That unnecessary schemes should be taken up, whilst works equally adapted to the end in view, ripe for execution, and perhaps actually in progress, were neglected, is a contingency not pleasant to contemplate, or likely to occur.

That the Department Public Works should be distinctly made responsible for bringing forward suitable works whenever pressure from scarcity arose goes without asking, so long as it be meant that the suitable works that they are to bring forward are works sanctioned and in course of or ripe for execution. If it be meant that the original suggestion of suitable works be made the duty of the Department Public Works alone, the end will not be sufficiently secured, for the initiation of such works does not and should not lie with that department, and the suggestion would in any case be made too late. However this may be, the question of sufficiently securing the end in view by the means suggested must depend on whether the distress is or is not such as could be met by the simultaneous undertaking of such suitable works as may happen to be ripe for execution at the time being. Of course, ordinary work not suitable for relief purposes should, so far as necessary and practicable, be set aside or postponed. To throw on the Department Public Works such responsibilities as naturally lie on the district officer would be to put the saddle on the wrong horse, and to miss rather than sufficiently secure the end in view.

Mr. Kennedy.—The efficacy of aid from the relief-works suffered last year chiefly from the delay in starting them, and from the want of suitable rules as to conditions of work and wages, and not from the want of previously prepared schemes. If these schemes had all been sent up to the Government for sanction, there would doubtless have been delay. But the works requisite at the commencement of a famine are for the most part small, and the authority to sanction them vested in a Commissioner prevented any loss of time; and, on the other hand, it may be assumed that schemes hastily prepared have not been thoroughly thought out, and that the works of the greatest public utility are not always first chosen. The works first taken up in this district were taken up because they happen to have been previously considered and worked out, but they were situated at the extremities of the district, where they could not afford all the relief that the same expenditure in a more favourable situation might have done. Where a number of projects have been worked out, those best adapted to the circumstances can be selected, whereas we had to be content last year with taking those which were in a sufficiently forward state of preparation to admit of their immediate execution.

Mr. Sandys.—The risk of waste would be really great unless the scheme prepared by the Public Works Department were such as admitted of all applications made by district officers for additional establishment being promptly met.

There would be no danger of the suffering population being left without proper relief, as, if the necessity occurred, district officers would at once be authorised to take in hand as many relief-works as they considered were required, although regular sanction to the plans and estimates had not been accorded. The works ordinarily in course of construction in this district under the Public Works Department would not supply what was requisite if severe scarcity arose; but this end could be secured by distinctly making the Public Works Department responsible for bringing forward suitable works, either in this district or elsewhere, as soon as the pressure first began to be felt, and for postponing all ordinary works not suitable for relief purposes.

Mr. Sells.—I do not think that there would be any inordinate waste resulting from the absence of any regularly prepared scheme, while on the other hand there may certainly be danger to the people in delay. For instance, such works as I have alluded to above, as test works, should certainly not await the formality of preparation of exact plans and estimates. Direct sanction from Government should be sufficient. And district officers should not, in my opinion, be hampered with instructions of too minute a nature, or with calls for elaborate returns.

Bengal.

BENGAL.

Colonel Cadell.—There is no doubt that, considering the circumstances under which labour is applied on relief-works, the risk of waste from the absence of regularly prepared objects is really great, and that the want of carefully prepared projects might cause delay in affording proper relief to the suffering population. In Bengal by far the greater proportion of the works required in the event of famine would be carried out by local committees, and not by the Public Works Department, which could not be held responsible for bringing forward suitable works in time of scarcity, unless all district works now carried out by local committees were placed directly under the Public Works Department.

Colonel Haig.—There is no doubt that, in the event of famine occurring without any regularly prepared scheme of works being ready for execution, there would be great waste. Large sums would be inevitably thrown away upon hastily improvised works which would afterwards be found useless or not worth the maintenance. If proper schemes are not ready, and the starving people must wait till they are ready, no doubt numbers must die. But I cannot see how the Public Works Department could fairly be held responsible for bringing forward suitable projects whenever pressure from scarcity arose, unless the preparation of new and revision of old famine schemes is to be a regular part of their duties; and as it is would certainly cost money, it is highly probable that it might be found cheaper to carry out the works at once in the ordinary course than amid the confusion and hurry of famine. If there is famine, and the Government is to interfere in such a way that the people shall not die, there must, under any circumstances, be waste—enormous waste—which the most carefully considered preconcerted arrangements will only slightly mitigate. The Public Works Department might possibly be more properly held responsible for not carrying out the works which would have prevented famine.

BOMBAY.

BOMBAY.

Colonel Anderson.—I do not consider that there should with ordinary discretion be any risk of waste from regularly prepared schemes not being ready. At the worst there are always a number of main lines of road in a district constructed as fair-weather roads, the turning which into roads of a superior description would always supply most useful work to a large number of people for a limited time. There is also the great wear and tear of ordinary trunk lines consequent on the increase of traffic in a famine to be provided for. I assume that famine would not break on the country at once, and that some month or two for provision would always be afforded.

MADRAS.

MADRAS.

Lieut.-Colonel Mullins.—There is not risk only, but absolute certainty, of great waste of money if projects suitable for the employment of the distressed be not completely ready before such employment is actually wanted. The experience of this has been far more than ample. There was in the famine of 1876–8, so far as the Chief Engineer for Irrigation is aware, no withholding of relief because there was no work ready to be done. The people were fed throughout almost entirely irrespective of work done, even when work was available. The Public Works Department, given the requisite means, can properly be held responsible that suitable works are ready whenever the pressure of scarcity arises. Without such means this department will be circumstanced as it was in 1876, when in the Irrigation Branch but little work was generally available in the localities* where distress was greatest and the people needing employment the most numerous, though, where there was no famine and no distress other than that arising from high prices, which were universal, there were considerable works ready for execution. In the Godavari, Kistna, and Tanjore Deltas, where extensive irrigation had been already provided, the famine not only was not prejudicially felt by the agricultural classes, but it brought them to more than the usual prosperity.

Major Montgomerie.—See answers to Nos. 3 and 4. If the Irrigation Department is placed on a proper footing, as already suggested, there will be no lack of suitable schemes ready for the employment of famine or any other labour. What has to be guarded against in seasons of famine is the misapplication of this labour, either during the first stages of the distress, when the necessity for affording relief is likely to be ignored until the people are beyond labour, or afterwards, when the Executive is almost certain to be hampered by over-legislation.

The Public Works Department is quite capable of suggesting and carrying out profitably works sufficient for the relief of a great deal of distress, but the head of the department must be permitted to make his own arrangements for the management of the labour given to him to employ if it is intended to obtain anything more than a mere nominal value for the money to be expended.

There can be no question that the risk of waste is really great, in nearly all cases, when large famine-relief works are commenced before the plans and estimates for them have been fully considered and sanctioned in due course. In certain kinds of work the risk is of course less than in others. For example, the Buckingham and Junction Canals on the East Coast were commenced before the plans and estimates were prepared and sanctioned, but the works had been under consideration a long time. The general course of the canal and the nature of the soil were known, and, the country being nearly flat, there was little difficulty in setting out the work in advance of the working parties. Besides, these works were under the charge of qualified officers of the Public Works Department.

It has already been suggested that lists of useful works should always be kept ready in all districts, to be available for times when it is necessary to give employment to an unusual number of people. There cannot, however, be any necessity for postponing ordinary works, which it may be assumed are works really required, and, if so, they must be as suitable in seasons of famine as at other times.

Mr. O'Shaughnessy.—A great famine does not rise at once; it comes on gradually and visibly, taking many months to reach its highest intensity. The ordinary works of a district could on emergency give useful employment for several months to two per cent. of the population, which would be five or six times the numbers of people ordinarily employed. It takes, according to past experience, several months before two per cent. of the population require State relief, and there would be time in this period to prepare fresh schemes, and there need be no great waste of expenditure,* even though a complete scheme of famine-relief works was not ready beforehand; nor would there be any danger that persons requiring work as a means of relief would be kept without employment. The Public Works Department should have no difficulty in giving employment to all persons seeking relief-work, or to persons sent to it for relief-work, and it might be held responsible to do so.

Major Mead.—There is not only risk, but certainty, of the greatest waste of money and also of hardship to the suffering population from there being no properly prepared scheme of relief-works. All that is wanted might be done without fail by the Public Works Department, provided that department is so far augmented as to have a strength commensurate with the requirements of the country, and is made *entirely independent* in its executive action in regard to works the advisability of carrying out which has been decided on.

Lieut.-Colonel Prendergast.—If there is no regularly prepared scheme there is the risk of funds not being applied so satisfactorily as if the district officers had their plans and estimates ready at hand; and according to the suddenness and intensity of the distress, there will be the danger of waste. But as in the famine that has now passed over the country there was warning of its approach, and measures were taken to meet it, it may be anticipated that, in future, there will be better preparation, and the risk of much waste will be diminished. As proposed in paragraphs 2 and 3 above, if estimates are kept on record, sanctioned, and ripe for execution, these may at once be undertaken by the Public Works Department. Works in course of execution are not so well suited for an emergency, for they are probably given out on contract. But it is my opinion that these works may go on simultaneously with the relief-works proper, so that the labourers employed on them may still have their accustomed occupation. I see no reason why ordinary budget funds should not be supplemented by grants from famine funds, so that budget works might be pushed on rapidly to completion and fresh works undertaken, instead of the ordinary departmental operations being suspended.

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* Nellore, Madura, and North Bellary excepted.

* This assumption is not borne out by general experience in the late famine.—G.A.B.

IV. QN. 10.
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MADRAS.

Mr. Rundall.—Yes, there is great risk of waste by reason of coolies not being employed on *large* works. At the same time, reviewing the districts at present in my charge,—Trichinopoly, Tanjore, Mandura, and Tinnevelly,—I know of no really large works which could be undertaken. Those I have named are second or third class works in point of size which would not afford work for more than 20,000 to 30,000 people for a few consecutive months.

Tank and road repairs could always be undertaken by the Public Works Department; the local officers, as a rule, having estimates in excess of the sums provided for allotment. When a large proportion of the population have to be provided for, small works should be closed and large ones opened to concentrate supervision. The Public Works Department can be responsible for the bringing forward suitable works only when establishment is given them to work up such schemes. The present scale of Public Works establishment in Madras allows no margin of officers for working up schemes and projects.

IV. QN. 11.
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QUESTION 11.—DIFFICULTY OF FINDING SUITABLE RELIEF WORKS.

Has there been practical difficulty in finding suitable relief-works during the recent pressure? If so, where and how? Make any suggestions on the subject of providing relief-works which may aid in meeting the difficulties that are found to arise in practice.

SUMMARY.

Difficulty in finding suitable relief works seems to have existed only in the Madras Presidency, owing principally to want of preparation.

NORTH-WESTERN PROVINCES.
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NORTH-WESTERN PROVINCES.

Colonel Brownlow.—There was apparently the very greatest difficulty in finding useful works for relief of distress during the late famine in Madras. The only large famine-relief work that I know of in that Presidency is the East Coast Canal, of which the alignment and design are exceptionally rudimentary. It is simply a large ditch, running, generally parallel to the coast, right across the drainage of the country. In many districts of Bombay there would have been great difficulty in getting up suitable projects in time for relief of famine distress; but the existence of Colonel Fife's schemes in a matured form prevented any necessity for preparing others. The readiness with which the Government of North-Western Provinces, during the late time of anxiety, prepared an extensive scheme of famine relief, was entirely owing to the existence in an advanced state of completion of projects for the Sardah Canal and other works; but I do not think that we should be justified in taking for granted that projects will always be available, unless direct orders are given that they must be so.

Mr. Edwards.—There has been no difficulty. When the number of labourers increased to say 40,000 or 50,000 men, and became too numerous for proper district supervision, the commencement of railway extension was strongly advocated; but the consent of the Imperial Government was requisite, and it was said not to be forthcoming. In consequence of an abundant rainfall the necessity soon passed away, and the numbers rapidly diminished. I can make no suggestions for the removal of purely imaginary difficulties.

Colonel Clark.—There has been no practical difficulty in finding suitable relief-works, and unless the numbers are enormously large there should not be any difficulty.

In this district the distress commenced in June, when the agriculturalist saw there might be no rain. It increased in July, when the kharif sowings had withered away, for so much edible seed had been lost. From that time to 11th February many must have known what distress was. Relief-works were opened on 11th February, first to aid the agriculturist over slack time till the rabi should be cut. In March the rabi was being reaped, and therefore works were closed. But in June 1878 the poorer classes had to be aided, and then relief-works were carried on till 15th October, by which time the coarser food-grain rain crops had to be reaped, and the better class had commenced being cut. During this time, by applying the wage and appearance test, the number did not assume any large proportions, and they melted away without any pressure as the grain got cheaper and there was field work to be done.

Mr. Blennerhasset.—There has been a difficulty in finding suitable relief-works in this district.

Large sums are being spent on district roads, which ordinarily would not be so spent.

Collectors cannot, under ordinary circumstances, provide a large amount of earthwork, and this is what is required.

If new district roads, or light-railway extension, or tank and old river-bed irrigation schemes, had been ready prepared, it appears probable that some more profitable undertaking than that now in hand would have been selected.

Mr. H. B. Harington.—In this district the pressure was not so great as to create any great practical difficulty in finding suitable relief-works. The assistance of Government was so readily accorded that the means of relief were found almost as soon as the distress was made known. The difficulties found to arise in this district were not such as to demand more than the exercise of ordinary intelligence and cordial co-operation between the Department Public Works, the district officer, and the Commissioner of the division, backed up by the assurance that the local Government would promptly sanction any well-digested scheme of relief. I do not think I am called on to make suggestions as to how to meet difficulties which I have not found to arise in practice.

Mr. Macdonald.—As far as the Tarai is concerned, there has been no difficulty in finding suitable relief-works. Repairing roads, filling unsightly excavations, digging and rooting of waste lands, fencing of forest reserves, and similar works can be done by the population, and there is for years plenty of room for work of the above nature.

Lieut.-Colonel Fisher.—There has been no practicable difficulty in finding suitable relief-works during the recent pressure, and I anticipate none in the future; and this is one of the chief reasons why I should object to being tied down to a scheme which may or may not be calculated to afford relief when the emergency arises. Roads must always need repair in portions of this district. Drainage and excavation work must always be procurable at very short notice; timber, lime, stones, and slates must always be required for the year's maintenance work; so why a district officer should be tied by the hands to a scheme which may not include the work most needing execution when famine comes is more than I can account for.

Mr. Spedding.—There has been no practical difficulty in finding suitable relief-works during the recent pressure, but, as I have elsewhere reported, the chief relief was given by cooked food in workhouses, of which 10, with three large hospitals, were kept open in the district for as long a time as they were required.

Mr. Ward.—In this district the difficulty of finding suitable relief-works did not present itself. All the persons likely to need relief could have been employed on works urgently needed until the provincial schemes were ready.

But the difficulty of obtaining prompt sanction to projects at the commencement of distress is undoubtedly an evil. Precious time is lost while a collector is debating whether he can conscientiously ask for an allotment on the ground that the people are starving.

The true experimental test is the actual readiness of the working classes to work for less than their ordinary remuneration. Suppose a collector to be riding or driving about his district at a time of great scarcity, he will find numbers of able-bodied men idling about with whom he can enter into conversation about their condition. They will tell him that they want work; that they are ready to work, if they could only get it, at an anna and a half a day. Let him take them at their word. He will not have far to look for some improvement wanted—some ugly pit to be filled up; some embankment to be repaired; some festering old buildings to be pulled down and levelled. Let him calculate the cost at a reduced rate, and offer to pay the men a lump sum when it is finished. If they don't agree, no harm is done. If they do, he has the nucleus of a gang of men to do earthwork at reduced rates.

It may safely be left for them to determine in their own homesteads which of the family shall work; how the employment shall be shared by the women and children; and who shall stay and keep house. Headmen of the gangs can be elected afterwards, and the rate can be raised, if it be absolutely necessary, in proportion as the price of grain rises.

It would be an advantage to collectors if some authenticated table of rates were published.

The rate for ordinary earthwork can be easily ascertained; but the kind of work which, more than any other, is suited for unskilled labour, is earthwork with a long lead. Half-a-dozen men are sufficient to supply with earth the baskets of some 50 or 100 women and children, if the distance it has to be carried is considerable; but I have been unable to obtain from any book, and my district engineer was wholly unable to calculate what addition should be made to the rate per 1,000 cubic feet of earthwork for every additional 100 feet of lead.

One great object to be kept in view is that all works undertaken should be either remunerative in money or supply an actual want. A collector administering a fund at his own disposal is tolerably certain to spend it economically; but if all he can do to relieve distress is to obtain an allotment of money which is to be spent by his district engineer under arbitrary rules framed at head-quarters, what scope has he for applying his economy?

It is casting no imputation upon engineers to say that their special education and training does not necessarily develop administrative capacity.

The persons most competent to construct a bridge or railway are not necessarily the most competent to decide whether or when it should be constructed.

The relations between collectors and district engineers are at present very far from satisfactory, in consequence of the whole administrative control, both of products and funds, being practically in the hands of the Public Works Department, while, nominally, the district engineer is held to be the collector's subordinate.

If the scheme of decentralisation which I have suggested could be carried out, and the district engineer be relieved of all nominal responsibility to the collector in provincial matters, while remaining his real subordinate and assistant in district matters, I am confident that both collectors and district engineers would be well pleased, and the interests of the public would be far better served.

Mr. Adams.—Owing to the want of a carefully prepared scheme of work, including completed estimates of projects which had been carefully considered, there has been some difficulty in employing the people in the manner which would have been financially most satisfactory.

The relief this year, however, has been on so small a scale that the difficulty has been little felt; but from the records it appears that it affected the relief in 1868–69, the result being the execution of works of little utility in comparison to their cost—a result which would have been avoided if a proper scheme of work had then been in existence.

Mr. Watts.—We found no difficulty here whatever, as the work of the Farukhabad and Cawnpore Light Railway more than provided for all our wants. Work still remains available on this line, in case of future distress, and we have also two large projects, one the Fatehgarh branch of the Ganges Canal and the other the rectification of the Kali nadi. I am not sufficiently acquainted with the circumstances of other districts to say whether any practical difficulty was experienced there or not. I have no other suggestion to make; all that appears to me necessary is (*a*) that projects should be prepared and *provisionally* approved of beforehand; (*b*) that district officers should have immediate sanction given on application to put them into execution; (*c*) that works shall be arranged at fitting centres of a district if they do not traverse it throughout.

Mr. Kennedy.—There has been no difficulty in finding suitable relief-works in this district, chiefly because the expenditure on original works had long been kept down to a minimum. The number of relief-works proposed has not been materially increased since the commencement, and the number of suitable schemes is undoubtedly limited; the total number of works proposed since the commencement is 14.

It would be difficult to add largely to this number. Only three other local earthworks of magnitude have occurred to me.

Mr. Sandys.—There has been no such difficulty in this district. The total number of relief works sanctioned up to date has been 17; of these 10 have been entirely completed and two are now in course of construction. The really useful works now left, and which are suitable for relief-works, are so few in this district that all able-bodied labourers should be transferred to other districts as soon as possible, and only the inefficient gangs given employment in this district. I doubt if sufficient employment for even the latter could now be found on useful works if the distress continued for more than one year.

IV. Qn. 11.

ORTH-
WESTERN
ROVINCES.

Mr. Sells.—In this district there has been no difficulty in finding suitable relief works during the past scarcity. But the pressure was here very slight indeed, and no inference can be drawn as to what might have been the case had the brief scarcity developed into long continued famine.

BENGAL.

Colonel Cadell.—During the last famine there was no practical difficulty in finding suitable relief-works, and no difficulty is likely to be experienced for some years to come. The local requirements are, however, being rapidly met, and difficulty may arise hereafter when the chief wants of the various districts have been attended to.

There is still, however, much to be done in the way of improved communications, &c. Projects for light railways might be prepared in advance for lines which might eventually be undertaken.

The Provincial Public Works Department might prepare projects in advance for drainage embankments and river improvements, and each district committee should have projects prepared in advance for works of utility which they propose eventually to undertake.

If this were done, there would be in a time of scarcity no hurry, no confusion, and no delay in affording relief to the suffering population.

BOMBAY.

BOMBAY.

Colonel Anderson.—I have not heard of any practical difficulty in providing useful work during the late famine. Opinions, of course, differ as to what is most useful, and this difference of opinion is of course apt to run by departments, each thinking their own line the most useful, irrigation officers advocating irrigation works, road engineers roads, &c. But the month or two before famine commences, if properly made use of, should suffice to dispose of all these differences of opinion.

In anticipation of possible need, a forecast of the most useful works required in each collectorate for the following two or three years should always be made and then reviewed by superior authority some months before any prospect of their being required occurs.

Mr. Propert.—There has been no difficulty, as regards Khandesh, in finding suitable works during the recent pressure. Some schemes were ready to hand, having been sanctioned as ordinary works in past years. Others were carefully prepared, and at the present time, in roads and tanks alone, we have a sufficient number of schemes to employ any number of labourers for at least a year or two. Nine relief-works out of 10 must surely consist of roads or tanks, or works in connection with such. A tank is, I think, the most convenient sort of work for relief purposes, inasmuch as earthwork alone will suffice to complete the project. Roads are also good; but unless Government are prepared to sanction expenditure on metal and masonry work as well as embankments, road projects carried out by relief gangs will never be of any permanent use. At ordinary times local funds cannot afford to complete long lines of communication, the commencement of which has been forced upon the district by sheer famine. It is, I think, a mistake to suppose that metalling and the construction of small culverts (I mean those actually necessary for traffic) will not employ relief labourers. All masons require coolies to help them, while stone-breaking or moorum-digging afford the means of exacting really hard labour. At any rate some attention should be paid to the completion or partial completion of works before fresh ground is broken, in order to ensure their utility hereafter. Large bridges should of course be not thought of.

Mr. Moore.—When projects were ready, such as those in the Mán and Khutau talukas, there was no difficulty whatever. In Khanapur and Tasgaon, the other two bad talukas, there was a difficulty because no projects had been framed. In Khanapur we had to resort to the improvement of the Karad Bijapur road, and in Tasgaon we put the people to work on the improvement of town roads.

MADRAS.

MADRAS.

Lieut.-Colonel Mullins.—There was great practical difficulty in finding suitable relief-works in most of the afflicted districts, and very little could be done to solve the difficulty, owing to the absence of preparation beforehand and the want of the requisite time and staff when the scarcity and distress had set in. The Public Works Department had very little to do with the famine until towards the end of 1877, and though the chief engineers were from time to time consulted as to what works were available in the several districts, the relief-works were, for the most part, under the Revenue officers, and the Public Works Establishments aided them by hurriedly estimating for laying out, and in some cases measuring, works. About a year after the commencement of the famine the Public Works Establishments were greatly strengthened, the system was changed, and the execution of relief-works was entrusted to them. Several projects were then taken up for investigation, and a few of these have been used for relief purposes, while others were not ready until the distress in their neighbourhood had subsided.

Major Montgomerie.—The principal difficulty in finding suitable irrigation schemes for relief-works was owing to the incomplete state of the investigation of most of the projects within the affected areas, and the want of the necessary establishment to complete them.

If schemes of irrigation are to be provided, they must be prepared beforehand by the Public Works Department; but this will not be satisfactorily accomplished until the irrigation branch is separated from the general branch, or the present strength of the department materially increased, as explained in answer to Question No. 2.

Colonel Foord.—There has not been much difficulty in finding relief-works during the recent pressure, but possibly they were not all suitable and useful works, for under no circumstances can it be proper to make a road that is not wanted or that it will not be possible to keep up after it has been made. There should not be any difficulty whatever in future, if care is taken to have always ready in each district a

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MADRAS.

programme of usual works two or three years in advance of ordinary annual requirements. The wants of a district in the matter of public works have been described by the Government of India as "practically quite unlimited and illimitable."

The chief engineer does not suppose that a famine, such as that which has lately visited the Madras Presidency can be coped with by the agency of the Public Works Department alone, but he believes that, so far as that agency is employed, it should be on works of the usual kind, sanctioned in accordance with the rules of the department, and carried out in accordance with the usual practice of the department.

Mr. Price.—There was most certainly in the Cuddapah district, and I believe everywhere else, great practical difficulty in finding suitable relief-works during the famine. This existed all through the district, and arose from the distress having found us unprepared and from the rapid flocking in of paupers requiring aid. I do not think that there can be much doubt as to the plan by which to meet the difficulty touching works during any future famine.

The proper course, in my opinion, is to employ a staff of engineers totally separate from that working districts in ordinary times, and to cause them, as soon as practicable, to go through each district, searching for, and examining, all projects, no matter of what kind, which might be of use to the State or the people, and to make estimates and plans for these, which should be sent up for sanction as works to be kept in reserve for a famine; and such of these as are approved and passed should be bundled in three parcels for each district, marked "beginning," "severe pressure," and "decline." How these should be arranged is a matter which might very easily be settled by the officers of the Public Works Department and the

Mr. Wilkinson.—A very great difficulty was experienced in finding suitable relief-works during the recent famine in the sub-division of Salem. New roads were not wanted, and the Local Fund Board being bankrupt, it was in one sense useless to construct new roads as they were not likely to be maintained. Such, however, was the pressure that a few were undertaken.

A large number of wells and guntahs were cleared of silt, and improvements were effected to village sites; but such works as these are, in my opinion, more suited to the last than to the first days of famine. Such works also provide employment for but a very small number of people.

From the very first I urged the necessity of some large work or works being undertaken under adequate supervision, and named several for which plans and estimates had long before been prepared; but sanction was not awarded.

A large number of irrigation works were in need of repair, and the civil officers were forced to undertake the quasi-repair of some of these works. The Department Public Works were under-officered, and had their hands full of work, and could render no assistance. Frequent applications for overseers and maistries received no attention, and the work which was done was, in consequence, in a great number of cases, of very little value. It is useless to expect tahsildars and village officers to carry out repairs to works of irrigation, unless they are efficiently supervised. During the recent famine effective supervision was up to October impossible, on account of the want of officers. I had up to March 1877 the famine administration of three taluks, with an area of 2,499 square miles and a population of 546,000. After March I had only two taluks, with an area of 1,745 square miles and a population of 360,657. I had no assistant at all till January 1877, when Major Baynes joined at Dharmapuri, and in February a covenanted assistant, who joined the service in December 1876, was posted to Krishnagiri. I had the revenue and magisterial and local fund administration of the whole sub-division, had to supervise the proceedings of, and hear appeals from, ten sub-magistrates, and yet was supposed to be able to inspect several hundreds of petty works, to see that proper work was done, that the coolies were properly paid, that the nominal rolls were correct, and that vouchers were forthcoming, as well as to visit each village to see that all who were in need of gratuitous relief obtained it, &c. It may be imagined how little time I had at my disposal to find out suitable relief-works.

These remarks will, I think, show that the main difficulty in the sub-division of Salem was the want of efficient supervision. Given this and the cordial co-operation of the Public Works Department, it would not have been difficult to provide relief-works for all who needed it.

Mr. O'Shaughnessy.—The Public Works Department experienced no difficulty in this district in giving suitable work to all persons seeking work as a means of relief during this famine. Its difficulty was entirely in the opposite direction. The ordinary works of the district were at a standstill, and the ordinary establishment was standing by idle for want of labour, while lakhs of rupees were being wasted on "civil-agency" works, some of which could well be deferred, some of which will probably be never completed, and some of which are of no earthly use whatever. This is no doubt attributable more to the system prescribed for famine relief than to the officers who conducted civil-agency works. The collector was held to be responsible that no one died of starvation, even when people in danger of death from starvation refused to accept relief at any distance from their homes. The people became impressed with this quasi-acknowledged responsibility, and they acted upon it.

Heads of villages fostered the impression, and encouraged the distressed in refusing relief at a distance, and to resist removal to a distance from their homes, with the object no doubt of retaining the distribution of relief in their own hands, or of getting some work done in which they had a personal interest. Exaggerated reports of distress were then circulated, and exaggerated descriptions of useful and necessary works said to be available in almost every village for the employment of the distressed were then reported. It is supposed that these reports were often supported by the authority of tahsildars, and the collector was, in a measure, forced to sanction proceedings which he probably knew to be extremely wasteful and wrong.

The most complete scheme of famine-relief works would be utterly useless under such a system; and until the responsibility of Government to save life from starvation, except at appointed places, and under prescribed conditions, is ignored, it will be a waste of time to prepare schemes of works for famine relief. A man who sits starving at his door, and forces his family to remain starving in his house, sooner than go to where he and his family are offered relief, seems, in a common-sense view of the matter, to render himself liable to the same legal restrictions or punishment that he would be liable to if he attempted suicide and murder; but it appears that this is not the case. Some even say it would be a cruel application of law to force a man to save his life by relief offered at a distance from his home. There are indications, however, that Government are accepting the common-sense view of the matter, and it is to be hoped that this view will be authoritatively acknowledged before the occurrence of another famine. There has been no difficulty in providing relief-works, and if it is left with the Public Works Department to provide relief-works no difficulty need be anticipated hereafter. It will, of course, rest with Government to decide whether these works are to be utilised for famine relief, or whether the distressed persons, the heads of villages, and subordinate officers of Government can, in their personal interests, in a manner, force schemes of their own for adoption by civil officers. These difficulties have been observed by Government, and they have been, for some time during this famine, to a great extent, removed by orders which define the duties of civil and public works officers, and by which civil officers are held responsible for the selection of fit objects for relief, while public-works officers are held responsible to give them suitable employment on works approved and sanctioned by competent authority.

P.S.—The number of people employed in ordinary years on all public works in Nellore is between 4,000 and 5,000.

Major Mead.—There has been no difficulty whatever in finding works, but there has been difficulty in making them available for relief purposes, owing to the absence of previously prepared designs and of anything like a sufficiency of members of all ranks of the Public Works Department, especially of competent overseers. The way to avoid this difficulty in future has been indicated in the answers to previous questions.

Lieut.-Colonel Prendergast.—I have heard that there was great practical difficulty in providing suitable relief-works during the recent pressure, in Bellary, for instance, and Kurnool. Projects were not prepared, and, in poor districts of great extent and somewhat thinly populated, it was a very arduous task to provide advantageous work for a large number of starving people. I have, however, no experience of my own regarding these districts. To provide in future for this difficulty, there must be estimates held in reserve; but the whole burden should not be thrown on the Public Works Department. A great deal of useful work was done in the past famine by the Revenue Department, and when a time of distress is coming on, but not yet fully developed, minor works that require no professional superintendence may with advantage be carried on by the revenue officers. The staff of the Public Works Department is small and not elastic; if it has to be suddenly increased for an emergency, fresh hands, without practical experience, must be brought in. The permanent professional subordinates should be kept to professional duties, and not have the sole charge of minor works, which can be carried out by the revenue subordinates with not more than casual advice and assistance from the professional department. In the North Arcot district a great deal of work was done that will benefit the country for years to come in clearing out the wells and village ponds, which are very numerous. This kind of work and the clearance of river-channels and spring-channels, as well as the collection of materials for road repairs, can be done without being put in the charge of the Public Works Department. These works, too, are particularly well adapted as preliminary measures of relief; they are found all over a district, and work can be put in hand by the revenue subordinates throughout each taluk at very short notice. All that is required can in this way be done to remove the danger of the population being left without proper relief until the larger works of relief are brought into execution. A great deal has been done in the recent famine in the way of road-works, new roads, in improvements to existing roads, and collecting material. A scheme may be drawn up and kept in hand to provide for a time of distress. Thus, for every taluk some additional roads and links between villages and the roads may be proposed, and approximate estimates made for the formation and for gravelling and metalling in fractions of a mile; also for road-dams, tunnels according to length, and the cross sections of nullahs and channels. It will take some time to have any comprehensive scheme matured, and the chief difficulty is in giving the extra work for its preparation to the public-works subordinates who have so much besides on their hands.

Major Vibart.—I believe there was great difficulty in many parts of Madras in finding suitable relief-works. The only suggestions that I can make on the subject of providing relief-works is for the Government to insist on plans and estimates being prepared for famine works to be worked out as soon as possible in every district, and for that purpose to provide each district with a special surveying staff for the purpose. I feel sure that until these required surveyors are made available nothing worth mentioning will be done. The present establishment of executives and assistants is too small, and they cannot efficiently get through the current work of their districts. The number of executive and assistant engineers in the Madras Presidency should be largely increased; and I think if the executive engineer of a division were relieved of direct personal charge of a range, he would be enabled to do far more good to the district he is attached to, both in the direction of new projects and also in the way of administrative reform, than at present, when his time is or will be frittered away in measuring up petty works, for the Examiner of Public Works Accounts requires completion certificates, and, without careful inspection and measurement, how can these be given?

Mr. Traill.—There has been difficulty found in providing suitable large works for relief-labour in this district. Nobody was ever allowed to starve for want of work, however. Large stores of metal and gravel have been collected and broken, and, in the event of another famine, the spreading of these would form a useful and large work. Under ordinary circumstances, it will be very many years before the supply now stored can be utilised, and it would have been more economical if the metal, &c. had been spread as it was collected. I have already suggested in my answer to Question 3 what I consider would be the most appropriate works to take up in the event of another famine.

IRRIGATION WORKS.

Ch. IV. Qn. 12.

Question 12.—Statistics of Irrigation.

What is the capital expended to date in the construction of the principal canals in your province, and what the yearly interest on that capital? What is the annual cost of maintenance? What is the present acreage irrigated? From this calculate the several corresponding rates per acre. What is the average local value per acre of the chief crops raised by irrigation from these canals? What is the difference between this and the average value of such crops raised without irrigation?

FINANCIAL RESULTS of IRRIGATION and NAVIGATION WORKS in the PROVINCES of RAJPOOTANA, BENGAL, NORTH-WESTERN PROVINCES, PUNJAB, and BOMBAY, prepared in the OFFICE of the INSPECTOR GENERAL of IRRIGATION.

NAME OF CANALS, &c.	Total Capital Cost up to end of 1877-78.	Gross Earnings Direct and Indirect during 1877-78.	Maintenance Charges during 1877-78.	Net Profits Direct and Indirect.	Percentage of Net Profits on Total Capital Cost.	Acres Irrigated during 1877-78.	Receipts from Water Rates during 1877-78.	Total Net Earnings from beginning to end of 1877-78.	Total Accrued Interest from beginning to end of 1877-78.	Difference, Surplus, or Loss.	REMARKS.
RAJPUTANA.	£	£	£	£	£	No.	£	£	£	£	
Tanks in Ajmere Sub-Collectorate	40,184	3,286	1,848	1,438	3·58	3,047	9	18,427	*	—	
" Beawur "	17,263	2,118	3,588	–1,470	–8·51	2,719	—	–2,669	*	—	
" Todgurh "	10,591	1,008	1,924	–917	–8·65	156	22	726	*	—	The Capital and Revenue Accounts of these works have just been completed, and are subject to revision. All ordinary.
Bheer Reservoir - - -	19,813	237	93	144	0·73	—	236	–95	2,801	–2,897	
Bulad " - - -	8,323	246	234	11	0·13	—	236	–162	793	–955	
Jalea " - - -	27,257	—	—	—	—	—	—	—	—	—	
Rajoshee " - - -	3,882	50	29	21	0·53	—	44	–23	363	–386	
Muckrera " - - -	3,176	—	—	—	—	—	—	—	—	—	
Ladpura " - - -	2,537	—	—	—	—	—	—	—	—	—	
Total - - -	133,026	6,945	7,716	+ 1,614 – 2,387		5,922	547	+19,158 –2,949	3,957	–4,238	
BENGAL.											
Orissa Project - - -	1,778,090	16,111	21,607	–5,497	–0·39	98,495	11,782	–102,403	521,079	–623,482	P. P. W.
Midnapore Series - -	705,177	17,010	20,381	–3,372	–0·48	19,819	5,348	–25,549	213,774	–239,322	Do
Tidal " - - -	178,391	6,228	3,056	3,175	1·78	—	—	4,844	60,599	–55,756	Do.
Sone Project - - -	1,908,504	10,129	25,241	–15,112	–0·79	241,385	5,965	–34,206	359,331	–393,537	Do.
Tirhoot " - - -	53,491	—	—	—	—	—	—	—	6,115	–6,115	In abeyance. Ordinary.
Hooghly " - - -	14,296	—	—	—	—	—	—	—	1,932	–1,932	Do.
Total - - -	4,637,859	40,478	70,285	+ 3,175 –23,981		359,699	23,095	+4,844 –162,158	1,162,830	–1,320,144	
NORTH-WESTERN PROVINCES.											
Ganges Canal - - -	3,054,899	322,743	978,700	224,873	7·36	1,045,014	236,856	1,655,294	2,674,678	–1,019,384	P. P. W.
Eastern Jumna Canal - -	261,235	80,243	20,357	59,886	22·93	206,732	53,970	918,639	303,231	615,408	Ordinary.
Agra " - -	804,408	25,977	15,792	10,185	1·26	163,634	19,393	–1,608	184,011	–185,619	P. P. W.
Dun " - -	62,453	6,325	1,898	4,427	7·09	12,360	2,005	47,063	61,946	–14,884	Ordinary.
Rohilcund " - -	155,204	9,331	7,692	2,139	1·38	32,198	2,682	34,986	63,039	–28,054	Do.
Bundelcund Irrigation Works -	8,262	491	375	116	1·40	1,490	269	–2,090	3,204	–5,294	Do.
Lower Ganges Canal - -	1,265,930	—	—	—	—	—	—	—	161,580	–161,580	Under construction. P. P. W.
Eastern " - -	27,652	—	—	—	—	—	—	—	8,893	–8,893	In abeyance.
Bundelcund Irrigation Survey -	32,575	—	—	—	—	—	—	—	8,448	–8,448	Do.
Total - - -	5,672,018	445,610	1,024,814	301,626		1,461,428	315,175	+2,655,982 –3,698	3,469,030	+615,408 –1,432,156	
PUNJAB.											
Western Jumna Canal - -	575,921	136,586	41,873	94,714	16·45	507,974	93,599	2,836,970	429,187	2,407,783	P. P. W.
Delhi and Goorgaon Irrigation Works.	18,341	431	490	–60	–0·32	2,098	324	34,243	24,310	9,933	Ordinary.
Baree Doab Canal (including Madhapur Workshops).	1,537,990	68,815	54,608	14,207	0·92	266,995	50,786	574,576	1,229,866	–655,290	P. P. W.
Lower Sutlej and Chenaub Inundation Canals.	10,809	32,058	16,962	15,097	139·67	284,680	68	354,114	8,101	346,013	Ordinary.
Upper Sutlej Inundation Canals	56,813	8,833	6,551	2,283	4·02	81,185	858	–9,092	41,415	–50,506	Do.
Indus Inundation Canals -	57,747	15,132	25,337	–10,205	–17·67	175,960	—	36,991	32,211	4,781	Do.
Shapur and Sahiwal Canals -	3,758	1,198	600	598	15·90	5,588	1,198	2,438	767	1,670	Do.
Sirhind Canal - - -	1,598,627	—	—	—	—	—	—	—	185,591	–185,591	Under construction. P. P. W.
Surat " - - -	31,174	—	—	—	—	—	—	—	2,572	–2,572	Do.
Derajat " (Special *Survey*) -	30,695	—	—	—	—	—	—	—	6,426	–6,426	
Lower Baree Doab Canal (Special *Survey*).	43,800	—	—	—	—	—	—	—	9,940	–9,940	In abeyance.
Abdool Rohim's Canal - -	3,510	—	—	—	—	—	—	—	369	–369	Ordinary.
Total - - -	3,969,185	268,053	146,421	+126,899 –10,265		1,324,480	146,833	+3,839,332 –9,092	1,970,755	+2,770,180 –910,694	
BOMBAY.											
Kushmore and Bigari Bund -	84,956	29	4,238	–4,209	–4·95	—	—	–8,542	10,583	–19,125	Ordinary.
Desert Canal (including Mucksooda).	55,672	5,750	2,164	3,586	6·44	44,112	—	21,357	11,988	12,370	Do.
Bigari Canal and Branches -	109,318	9,608	6,983	2,625	2·40	63,179	43	113,694	45,982	67,713	P. P. W.
Kassimpur Bund (Roree District, Shikarpore Canal).	6,776	—	359	–359	–5·29	—	—	–458	475	–933	Ordinary.
Sukkur and Shadadpore Canal -	122,422	2,597	4,312	–1,715	–1·40	61,898	11	–15,233	47,452	–62,685	P. P. W.
Eastern Narra Works - -	301,643	18,335	12,518	5,817	1·93	92,807	86	148,605	195,861	–47,256	(Partly) P. P. W
Ghar Canal and Branches -	41,683	37,488	13,896	23,592	56·60	19,912	134	629,416	21,176	608,241	Ordinary.
Allibhur Cutcherry Canal - -	2,319	828	610	218	9·40	–222	43	–789	478	–1,267	Do.

* No interest being calculated for these tanks.

NAME OF CANALS, &c.	Total Capital Cost up to end of 1877–78.	Gross Earnings Direct and Indirect during 1877–78.	Maintenance Charges during 1877–78.	Net Profits Direct and Indirect.	Percentage of Net Profits on Total Capital Cost.	Acres Irrigated during 1877–78.	Receipts from Water Rates during 1877–78.	Total Net Earnings from beginning to end of 1877–78.	Total Accrued Interest from beginning to end of 1877–78.	Difference, Surplus, or Loss.	REMARKS.
BOMBAY—continued.	£	£	£	£	£	No.	£	£	£	£	
Marak Great Canal	17,099	5,802	1,673	4,130	24·15	1,678	189	12,230	3,317	8,913	Do.
Surfrazwah „	12,138	1,057	1,282	−224	−1·85	467	133	−674	2,759	−3,432	Do.
Fuleli „	67,507	15,103	15,164	−62	−0·09	6,151	1,482	−14,157	76,165	−90,322	Do.
Pinyari Canal	1,687	7,688	4,946	2,742	162·57	543	61	2,872	200	2,672	Ordinary.
Hathmati „	48,175	354	477	−124	−0·25	104	337	−2,300	11,313	−13,613	P. P. W.
Khari Irrigation Sluices	7,551	2,656	321	2,334	30·91	625	—	3,816	3,522	34,593	Ordinary.
Hartola Tank	6,294	—	36	−36	−0·58	2	—	45	1,437	−1,393	Do.
Lower Panjra River Works	45,692	378	135	243	0·53	82	31	759	18,370	−17,611	P. P. W.
Jamda Canal	94,576	547	1,856	−1,309	−1·38	492	528	−9,784	46,953	−56,737	Ordinary.
Palkheer „	18,835	282	424	−142	−0·75	108	220	−662	6,112	−6,774	P. P. W.
Warali „	2,671	79	67	12	0·43	21	79	−346	1,346	−1,692	Ordinary.
Ojhar „	24,041	330	219	111	0·46	184	314	−78	5,366	−5,445	Do.
Lakh „	33,007	323	525	−202	−0·61	154	313	−5,560	14,973	−20,533	P. P. W.
Bhatori Tank	34,719	66	96	−30	−0·09	55	63	−370	11,741	−12,112	Ordinary.
Mutha Canal	525,488	13,357	3,645	9,712	1·85	536	1,065	16,992	132,889	−115,897	P. P. W.
Kasurdi Tank	4,389	13	61	−48	−1·09	22	9	−478	2,096	−2,574	Ordinary.
Koregaum „	1,918	—	4	−4	−0·18	—	—	267	1,298	−1,031	Do.
Ekrook „	122,699	604	980	−377	−0·30	184	246	−10,448	45,269	−55,717	P. P. W.
Remari Canal	4,034	315	130	186	3·76	65	312	−598	3,024	−3,621	Ordinary.
Yerla „	33,412	46	75	−30	−0·09	25	45	−2,036	6,105	−8,142	Do.
Gondowli „	9,117	25	71	−45	−0·50	16	21	−807	3,339	−4,146	Do.
Maini Tank	32,606	104	173	−68	−0·21	98	101	−263	9,376	−9,638	Do.
Chickli Canal	5,456	68	60	8	0·15	21	64	−750	2,081	−2,832	
Krishna „	76,031	1,863	1,634	228	0·30	4,093	1,749	−6,526	38,490	−45,015	P. P. W.
Kalala Dam	2,970	—	2	−2	−0·08	—	—	−438	2,143	−2,581	Ordinary.
Madag Tank	21,998	213	351	−139	−0·63	550	212	−2,777	7,990	−10,767	Do.
Muswah „	10,546	—	—	—	—	—	—	—	972	−972	Do.
Waghad „	126	—	—	—	—	—	—	—	1	−1	Do.
Motoha „	13,801	—	—	—	—	—	—	—	101	−101	Do.
Patus „	13	—	—	—	—	—	—	—	4	−4	Do.
Sirsaphall „	13,467	—	—	—	—	—	—	—	80	−80	Do.
Badalwadi „	279	—	—	—	—	—	—	—	1	−1	Do.
Nira Canal	34,548	—	—	—	—	—	—	—	3,467	−3,467	Do.
Ashti Tank	21,645	—	—	—	—	—	—	—	207	−207	Do.
Pangaon „	6,151	—	—	—	—	—	—	—	24	−24	Do.
Pinjlee „	15,916	—	—	—	—	—	—	—	198	−198	Do.
Muswad „	22,594	—	—	—	—	—	—	—	332	−332	Do.
Neueree „	732	—	—	—	—	—	—	—	10	−10	Do.
Gokak Canal	8,886	—	—	—	—	—	—	—	35	−35	Do.
Dambal Tank	5,267	—	—	—	—	—	—	—	77	−77	Do.
Doni Reservoir	938	—	—	—	—	—	—	—	81	−81	Do.
Maninkop Tank	930	—	—	—	—	—	—	—	52	−52	Do.
Medleri „	3,023	—	—	—	—	—	—	—	33	−33	Do.
Guttprabha Survey	5,514	—	—	—	—	—	—	—	1,703	−1,703	Do.
Mullprabha „	1,655	—	—	—	—	—	—	—	641	−641	Do.
Eastern Delta „	1,862	—	—	—	—	—	—	—	171	171	Do.
Roree and Hyderabad Survey	7,677	—	—	—	—	—	—	—	3,684	−3,684	Do.
Jambrow Canal „	3,816	—	—	—	—	—	—	—	689	−689	Do.
Sabarmutti Canal „	3,527	—	—	—	—	—	—	—	1,272	−1,272	
Tapti „ „	19,793	—	—	—	—	—	—	—	5,946	−5,946	
Bhokar Tank „	1,023	—	—	—	—	—	—	—	406	−406	
Bhima and Sina „	3,650	—	—	—	—	—	—	—	1,264	−1,264	
Sind Canal	12,269	—	—	—	—	—	—	—	—	—	Accounts not completed.
Western Narra Works	12,028	—	—	—	—	—	—	—	—	—	
Total	2,211,475	125,908	79,487	+55,542 −9,125		+298,184 −222	7,891	+963,053 −84,074	818,120	+734,673 −644,171	

N.B.—P. P. W. means that the work is classed as a Productive Public Work on which loan funds have been expended.

NOTE.—The accounts of Irrigation Works in Madras and British Burmah have not been finally completed as yet; they are not, therefore, entered in thi statemen A statement for Madras is given on page .

SUMMARY of the preceding STATEMENT.

CH. IV. QN. 12

—	Total Capital Cost up to end of 1877-78.	Gross Earnings Direct and Indirect during 1877-78.	Maintenance Charges during 1877-78.	Net Profits Direct and Indirect.	Percentage of Net Profits on Total Capital Cost.	Acres Irrigated during 1877-78.	Receipts from Water Rates during 1877-78.	Total Net Earnings from beginning to end of 1877-78.	Total Accrued Interest from beginning to end of 1877-78.	Difference, Surplus, or Loss.
	£	£	£	£	£	No.	£	£	£	£
Rajputana	133,026	6,945	7,716	+1,614 −2,387		5,922	547	+19,153 −2,949	3,957	−4,238
Bengal	4,637,859	49,478	70,285	+3,175 −23,981		359,699	23,095	+4,844 −162,158	1,162,830	−1,320,144
North-Western Provinces	5,672,018	445,610	1,024,814	301,626		1,461,428	315,175	+2,655,982 −3,698	3,469,030	+615,408 −1,482,156
Punjab	3,969,185	263,053	146,421	+126,899 −10,265		1,324,480	146,833	+3,839,332 −9,002	1,970,755	+2,770,180 −910,694
Bombay	2,211,475	125,908	79,487	+55,542 −9,125		+298,184 −222	7,891	+953,053 −84,074	813,120	+734,673 −644,171

An approximate Statement comparing the net Annual Revenue derived from the Eight principal Systems of Irrigation in the Madras Presidency with the Capital Outlay upon each to the End of the Official Year 1875–76, prepared in the Department of Public Works (Irrigation) Accounts.

Systems.	Capital Expenditure up to 31st March 1876.	Gross increased Revenue due to Irrigation to 31st March 1876.	Working Expenses to 31st March 1876.	Net Revenue.	Year from which increased Revenue is obtained.	Period to which increased Revenue refers.	Yearly Average net Revenue.	Per-centage of yearly Average Revenue on Capital Outlay.	Present Acreage irrigated.	Rate per Acre.	Remarks.
	Rs.	Rs.	Rs.	Rs.			Rs.		Acres.		
1. Chembrambakam tank.	5,26,819	62,172	71,069	8,897	1871-72	5 years.	1,179	·34	7,571	Unknown. The assessment is consolidated.	Improvements completed in 1870-71.
2. Godavari Delta system.	73,64,443	2,45,71,999	58,00,075	1,87,71,924	1847-48	29 „	6,47,308	8·79	525,398	2 15 1	Anicut completed in 1846-47.
3. Cauvery do.	13,48,900	2,14,63,455	47,86,180	1,66,77,275	1837-38	39 „	4,27,622	31·7	851,749	Unknown. The assessment is consolidated.	No reliance can be placed on this figure. Improvements completed in 1836-37.
. Kistna do.	46,35,898	88,89,154	25,74,952	63,14,202	1855-56	21 „	3,00,676	6·49	264,256	2 15 10	Anicut completed in 1854-55.
5. Palar do.	12,57,922	13,88,104	1,87,627	12,00,477	1856-57	20 „	60,024	4·77	21,291	Unknown. The assessment is consolidated.	Do. in 1855-56.
6. Pelandorai do.	2,73,087	—	—	—	—	—	—	—	—		Anicut was only completed in 1876-77.
7. Pennar do.	13,40,201	1,06,314	*37,933	68,381	—	1 year.	68,381	5·1	54,102		Anicut completed in 1861-62.
8. Srivaikuntam do.	11,07,713	1,05,114	98,770	6,344	1871-72	5 years.	1,269	·12	30,019		Do. in 1869-70.

Information respecting revenue is as yet unknown to this office for the period subsequent to 1875-76. The outlay has, therefore, been entered to correspond. In the case of the Cauvery Delta system, revenue information being available only up to 1874-75, the outlay on that system has been shown accordingly.

* The exact working expenses of the Pennar anicut system are not available prior to 1875; the charge for the year 1875-76 and the corresponding revenue for that year only have been entered in consequence.

16th September 1878. (Signed) F. BEAUCLERK.

PUNJAB.

PUNJAB.

Capt. J. W. Ottley, R.E.

ANNUAL COST of MAINTENANCE for the 10 Years ending 1877-78 :—

Years.	Western Jumna Canal.	Bári Doáb Canal.	Upper Sutlej Inundation Canal.	Lower Sutlej and Chinab.	Indus.	Shahpur.
1868-69	2,41,017	3,65,585	60,312	1,60,956	1,10,063	—
1869-70	3,89,787	3,68,747	84,677	1,71,883	1,24,009	—
1870-71	3,38,729	4,23,371	91,742	1,88,185	1,17,374	4,139
1871-72	3,76,454	3,47,983	1,49,226	1,44,144	1,57,826	4,181
1872-73	4,01,178	3,15,702	1,56,206	1,63,623	1,80,464	4,339
1873-74	3,72,982	*6,72,523	1,17,034	1,63,993	1,58,059	4,187
1874-75	3,38,737	3,56,883	1,10,640	1,56,269	1,91,736	3,690
1875-76	3,75,158	5,02,401	1, 3,066	1,63,694	1,90,013	5,214
1876-77	3,89,373	5,68,399	78,358	1,55,640	2,13,963	5,778
1877-78	4,18,725	5,28,987	65,507	1,69,616	2,53,365	6,001
Total -	36,42,140	44,45,581	10,26,768	16,38,003	16,96,872	37,529
Average Rs.	3,64,214	4,44,558	1,02,677	1,63,800	1,69,687	4,691

* Rs. 3,26,437 are due to the Madhopur workshops. Under the orders of the Government of India the working expenses of the Madhopur workshops from this date have been debited to the Bári Doáb Canal, but the shops have now been closed and are under liquidation.

II. IV. Qn.12.

PUNJAB.

The ACREAGE IRRIGATED in each year for the 10 Years ending 1877–78, and the Average Area in Acres deduced therefrom.

Years.	Western Jumna Canal.	Bári Dáob Canal.	Upper Sutlej.	Lower Sutlej and Chenab.	Indus.	Shapur.
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.
1868–69	4,86,878	2,99,835	66,584	1,99,463	1,07,160	—
1869–70	4,96,542	2,33,927	1,48,796	2,43,093	1,29,177	—
1870–71	4,62,707	2,79,210	77,070	2,02,036	1,74,342	2,460
1871–72	4,44,385	2,87,070	87,043	1,88,465	1,44,334	4,113
1872–73	3,51,820	2,28,796	1,35,349	2,42,504	1,80,137	4,445
1873–74	3,11,747	2,32,146	65,233	1,97,064	1,63,020	4,080
1874–75	3,82,847	2,79,183	84,120	2,73,688	1,71,822	6,355
1875–76	3,09,595	2,14,599	1,38,937	2,77,883	1,44,960	4,041
1876–77	3,66,482	2,02,712	74,243	2,85,645	1,66,574	9,123
1877–78	5,07,974	2,66,995	81,185	2,84,680	1,71,604	5,588
Total -	41,20,977	25,25,103	9,58,560	23,94,521	15,53,130	40,205
Average -	4,12,098	2,52,510	95,856	2,39,452	1,55,313	5,025

Total average 1,160,254 acres.

Note.—The total area irrigated during 1877–78 (including the Delhi and Gurgaon Irrigation Works, which watered 2,098 acres) was 1,320,124 acres.

Rates per Acre of Capital expended and Cost of Maintenance.

Taking the acreage irrigated and the maintenance in 1877–78, and the total capital outlay up to the end of the same year, we arrive at the following results:—

On the Western Jumna Canal the capital was Rs. 11·5 per acre and the maintenance about 13 annas an acre.

On the Bári Doáb Canal the corresponding figures are Rs. 55·5 and nearly Rs. 2. These figures are, however, not really comparable either as to capital or maintenance. As regards capital, the Western Jumna Canal being partly an old native work, the capital shown is smaller than would be the case if the same work had to be executed at the present day. This canal, too, is a very long-established one, on which irrigation may be said to have attained very nearly its full growth. On the other hand, the irrigation on the Bári Doáb Canal is not yet fully extended, so that the capital falls at present on a smaller acreage than will eventually be the case; and further, owing to the physical difficulties of the country, as well as to the more recent period of its construction, the incidence of the outlay must necessarily, other things being equal, exceed that of the Western Jumna Canal.

Again, as regards maintenance, this item, as well as its incidence, must vary greatly from year to year according as more or less extensive repairs are executed, and as the season is favourable to irrigation or otherwise; but from a comparison of the returns of a number of years, it may be said that, taking one year with another, the maintenance charges on a fully developed canal should average from 12 annas to one rupee per acre. The incidence of the capital will, of course, depend on the peculiar circumstances of each case; it might, perhaps, be put down as a very rough estimate at from Rs. 25 to Rs. 30 per acre for a canal without navigation. The maintenance charges and the acreage irrigated have been furnished above for the inundation canals as well as for the permanent canals; but, as all these inundation canals are worked on different systems, which are often the merest modifications of those which prevailed when the Punjab was under native rule, it will be understood that no advantage would be derived from a comparison of their capital accounts, as shown by this department, with similar statistics of canals which have been mainly or entirely constructed by the British Government since the annexation. The same remark applies, but with even greater force, to any comparison of the maintenance charges which on inundation canals are, in many cases, merely nominal, the necessary work being performed as part of the duties of the irrigators under the land settlement.

Average Local Value per Acre of the chief Crops raised by Irrigation from the Canals in question.

The information given in the following table is obtained from the returns published in the Revenue reports, and are obtained yearly from the district officers. No opinion can be formed in this office as to the amount of reliance which may be placed on them:—

	Western Jumna Canal Average of 8 Years.	Bári Doáb Canal Average of 10 Years.
	Rs.	Rs.
Sugar-cane	106·28 per acre.	82·25 per acre.
Cotton - -	41·39 „	40·57 „
Jowár - -	18·65 „	21·47 „
Rice - - -	60·74 „	42·78 „
Wheat - -	37·16 „	31·41 „
Barley - - -	26·13 „	17·28 „
Indigo - -	169·56 „	not grown
Gram - - -	18·61 „	24·56 „

Amount per Acre paid for the use of Water for the chief Crops by the Occupier in the shape of water-rate.

	Western Jumna Canal.	Bári Doáb Canal.	Upper Sutlej Inundation Canals.
	Rs.	Rs.	Rs.
Sugar-cane - -	5 per acre	6 per acre.	1 12 0
Cotton - -	2 2 0	2 8 0	2 0 0
Jowár - - -	1 10 8	1 8 0	1 8 0
Rice - -	3 0 0	4 12 0	3 0 0
Wheat - - -	2 4 0	2 8 0	0 12 0
Barley - -	2 4 0	2 8 0	0 12 0
Indigo -	2 4 0	2 8 0	1 4 0
Gram - -	2 4 0	0 12 0	1 4 0

The above rates are those charged for flow irrigation. When the water is lifted on to the fields the charge made is ⅔rds on the Western Jumna Canal and ½ on the Bári Doáb and Upper Sutlej Inundation Canals of the above flow rates. The great divergence of rates noticeable on the Upper Sutlej Inundation Canals is due to the fact that the number of waterings necessary from wells to supplement the inundation irrigation had to be taken into account. Thus rice, cotton, gram, and jowar can be usually matured by the canal water alone, which, in the case of wheat, barley, and sugar-cane, requires to be supplemented by wells.

Mr. Roe.—The canals referred to in the following replies are the inundation canals of the Mooltan district. They are 36 in number; viz., 19 from the Sutlej and 17 from the Chenab. They are cuts from the rivers, varying from 3 or 4 to 50 miles in length, with a breadth of from 4 to 30 feet. The total length of the main channels is about 650 miles. The first Chenab canal leaves the river about 20 miles to the north of Mooltan; the head of the first Sutlej canal is about 80 miles above the junction of the two rivers. None of the canals run at a great angle from the river, but they all strike inland as far as the slope of the country will permit. They fill gradually as the river rises, beginning to work about the 15th April, being at their full in July, and ceasing about 15th September. If they continue to flow beyond this, the irrigation benefits the land for the ensuing rabbi. My experience of the canals has been obtained during the 5½ years I have been in charge of the settlement of this district.

The canals were all constructed under native rule, so there is no capital account. They are maintained by the "cher system;" every person taking canal water is liable for so many days' labour at the annual clearances of the canal from which he draws his supply. These persons are called "chers," and a full "cher" has to give 90 days' labour. For this he receives no pay. The irrigated area for which a "cher" has to be given varies on the different canals from 14 to 50 acres. According to the returns of the present settlement, the area irrigated is by canals alone:—

By Paggu (flow)	54,594	
By Jhilár (lift)	16,738=	71,332
By wells aided by canals		2,63,236
Total		3,34,568

It is impossible to calculate acreage rates. The chief crops grown on canal lands are indigo, cotton, and sugar. These crops could not be grown at all (except a little cotton) without canal water. In the present settlement estimates the gross value of indigo per acre has been calculated at between Rs. 17 and Rs. 18; that of cotton about the same; sugar at between Rs. 52 and Rs. 53. If the rabbi crops, like wheat, get a good watering, their yield may be reckoned at from a maund to 2 maunds per acre heavier than when not so irrigated. But the general effect of the canal irrigation is rather to extend the area of cultivation than to increase the yield per acre.

Postscript to answers by Mr. C. Roe, Settlement Officer, Mooltan.

In my reply to the above question, by a "cher" is meant the labourer himself, and a "full cher" is a labourer who has to give the full quota of 90 days' work.

The number of chers, *i.e.*, full chers, necessary for the clearances was fixed for each canal by the settlement officer at the regular settlement. The total irrigation of the canal, divided by the number of chers, gives the number of acres which has to provide one full cher. This varied on each canal.

On the Sutlej canals the irrigated area per cher varied from 14 to 32 acres, the average being 25 acres. A cultivator irrigating less than the standard of his canal, has to give so many days' less labour; *e.g.*, the standard is 25 acres. He cultivates 10 acres. He therefore has to give $\frac{2}{5} \times 90$ days=36 days' labour; and he would generally be spoken of as giving two fifths, or 6 chittacks of a cher. Similarly, if he cultivates 50 acres, he would have to give two chers.

This standard, however, varies annually; for the number of chers fixed at settlement is always called out. It is distributed over the different villages by munsiffs, and inside the villages by lambardárs. But the canal officers keep, as a check on this distribution, the measurements of the irrigation of the preceding year; and it is on this that the chers are practically assessed. For instance, for the Matithal canal, 90 chers were fixed. The irrigated area was 1,800 acres, which gave the standard of 20 acres per cher. If in any year the irrigation doubled, only the 90 chers would still be called out, and the standard for that year would be 40 acres per cher; and, similarly, if the irrigated area were only 9,000 acres, every 10 acres would then have to give a full cher.

Mr. E. O'Brien.—No statistics exist of the capital expended on, or of the interest on, the capital.

The annual cost of maintenance is as follows:—

	Rs.
3,00,000 labourers working one day each, at 6 annas per day	1,12,500
Pay of establishment, and fines on absentee labourers	24,771
Total	1,37,271

The area irrigated when the settlement measurements were made in 1874–75 was 200,081 acres. No statistics before or after that year exist.

It is not understood what the "corresponding rates per acre" mean. In this district, every kind of irrigation, whether flow or lift, superior crops or inferior crops, requiring many waterings or few, contribute uniformly their quota of labour and of the payment of establishment. The amount of that quota depended hitherto on the amount of land revenue paid by the land irrigated. Under recent orders of Government, the cost of maintenance is to be distributed over the area irrigated.

The rate per acre which irrigation costs the agriculturalist is Rs. 1,37,271÷2,09,081 acres=Rs. 0,10,6 acre. In this district, the only unirrigated lands are the river sailába lands. The rainfall is so small that no crops can be grown from rain alone. Irrigated land here is that which grows two crops in the year—1, a kharíf crop, irrigated by inundation canals; 2, a rabbi crop, the land for which is softened for ploughing; and the seed is sown by canal water, and the crop is matured in the cold season by irrigation from wells. Unirrigated, *i.e.*, sailába land, grows only one, *i.e.*, the rabbi crop. Therefore, a comparison can only be made between an acre of unirrigated land bearing one crop, and an acre of irrigated land bearing two crops in the year. An acre of unirrigated land will produce 8 maunds of wheat, equal in value, at 27 seers 10 chittaks per rupee, to *Rs. 11-9-4.

An acre of irrigated land will produce 10 maunds of wheat, in value, at 27 seers 10 chittaks per rupee, to *Rs. 14-7-8, plus 5 maunds of cotton, equal in value, at 11 seers 1 chittak per rupee, to Rs. 18-1-3.*

The local value per acre of these crops will be Rs. 11-9-4 per acre for unirrigated land, and Rs. 32-11-11 for irrigated land.

Wheat has been chosen because it is the crop most grown, and cotton, as being equally placed in relative value to sugar, indigo, and vegetables on the one hand, and rice, jowár, and bájra on the other.

Major E. C. Corbyn.—The capital expended to date on the construction of the principal Government canals (noted below) of the Shahpur district is Rs. 85,500, and the yearly interest on the capital, at Rs. 4½ per cent., is Rs. 3,847-8. The annual cost of maintenance is Rs. 14,500. The present acreage irrigated is 21,500 acres. The average local value per acre of the chief crops raised by irrigation from these canals is, wheat, Rs. 20, and bájra, Rs. 16. The difference between this and the average value of such crops raised without irrigation is, wheat, Rs. 14, and bájra, *Rs. 10.*

PUNJAB.

Name of Canals.	Capital expended in Construction.	Interest on Capital, @ Rs. 4½ per cent.	Annual Cost of Maintenance.
	Rs.	Rs.	Rs.
Civil Station Canal -	37,000	1,665	6,500
Sàhiwàl „ -	3,000	135	1,000
Mr. Macnabb's „ -	7,000	315	500
Raniwah „ -	28,500	1,282-8	5,000
Corbynwah „ -	10,000	450	1,500
Total -	85,000	3,847-8	14,500

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Mr. C. C. Anderson.—(5.) The average value per acre in 1876–77 of crops raised by canal irrigation was—

Gardens -	66·00	Grain -	17·79
Sugar-cane -	66·09	Peas -	15·09
Wheat -	25·00	Fodder -	12·00
Barley -	14·50	Cotton -	14·59
Rice -	32·00	Indigo -	15·00
Maize -	15·50	Opium -	32·00
Joar -	14·69		

The average value of similar crops unirrigated is not known. Sugar-cane, wheat, rice, indigo, as a rule, cannot be raised except by irrigation.

Board of Revenue.—The chief crops raised by irrigation from the canals (excluding garden produce and water-nuts) are sugar-cane, opium, indigo, and rice (which are only in very few tracts grown without irrigation), wheat, barley, gram (which sown by itself is rarely watered). The average value per acre of these crops, watered from the canals, taken from the figures given at page 14 of the Irrigation Revenue Report for 1876–77 are (the figures in the upper line showing the value, in the lower, the acreage of the crop)—

		Per acre. Rs.
Sugar-cane -	- $\left(\frac{85,67,020}{129,607}=\right)$	66·1
Opium -	- $\left(\frac{3,78,328}{11,729}=\right)$	32
Indigo -	- $\left(\frac{22,28,835}{143,589}=\right)$	15
Rice -	- $\left(\frac{27,11,808}{84,744}=\right)$	=32
And Cotton -	- $\left(\frac{12,14,910}{40,497}=\right)$	
Wheat -	- $\left(\frac{1,33,07,875}{532,315}=\right)$	25
Barley -	- $\left(\frac{23,27,714}{160,532}=\right)$	14·4
Gram -	- $\left(\frac{3,09,844}{17,407}=\right)$	18 nearly.

The average *local* value per acre of the respective crops raised with and without irrigation (excluding those which are never or hardly ever unirrigated) in some of the canal-irrigated districts are:—

Crop.	VALUE OF CROP PER ACRE.	
	Cawnpore.	
	Irrigated.	Unirrigated.
Wheat - - - - -	28	12
Bajra - - - -	18	10

BENGAL.

BENGAL.

Colonel Haig.—The following statement shows—

(1.) The capital expended to end of 1877–78 in the construction of the principal canals in Bengal;
(2.) The yearly interest on that capital; and
(3.) The annual cost of maintenance.

The "cost per acre now irrigated" has absolutely no meaning whatever, as the greater part of the expenditure on the really costly works has been already incurred, while, for want of a small additional outlay on the distributaries, only a fraction of the area commanded by the main canals is actually irrigable. The return is, however, given as asked for.

—	Capital Outlay to End of 1877–78.	Annual Interest on Capital Outlay at 4½ per cent.	Average annual Cost of Maintenance for the last Four Years.	Area irrigated in 1877–78.				Rate per Acre now irrigated.			Remarks.
				Khurreef.	Rubbee.	Perennial.	Total.	Capital Outlay.	Interest.	Maintenance.	
ORISSA PROJECT.	Rs.	Rs.	Rs.	Acres.	Acres.	Acres.	Acres.	Rs.	Rs.	Rs.	
Mahanuddy Series - -	1,45,42,808	6,54,426	2,08,694	85,000	4,495	253	89,748	162	7·3	2·3	
Brahminee and Byturnee Series - - - -	32,07,972	1,44,359	—	—	—	—	—	—	—	—	Not yet opened.
Midnapore Canal - -	70,51,773	3,17,330	1,68,229	19,775	674	—	20,449	344·8	15·5	8·2	
Hidgellee Tidal Canal -	17,72,699	79,771	29,141	—	—	—	—	—	—	—	For navigation only.
SONE PROJECT.											
Western Main Canal Series	1,21,92,222	5,48,650	1,19,577	85,804	1,29,012	9,690	2,24,506	54·3	2·4	0·5	
Eastern „ „ -	68,75,943	3,09,417	69,567	64,090	—	—	64,090	107·3	4·8	1·8	
Tirhoot Project - -	5,34,907	24,071	—	Projects either abandoned or in abeyance.							
Hooghly - - -	1,42,808	6,426	—								
Damoodur - - -	1,59,502	7,177	—								
	4,64,80,634	20,91,627	5,95,208	2,54,669	1,34,181	9,943	3,98,793				

The rate per acre now irrigated is here calculated upon the areas irrigated in 1876-77, but these areas vary largely from year to year. That under the Midnapore canal was 70,000 acres a few years ago, and is 60,000 acres in 1878-79. All the projects are unfinished, and only partially in operation.

BOMBAY.

BOMBAY.

Mr. Hughes.—Excluding outlay on improvements to two old works, the revenue accounts of which are incomplete, the total capital outlay on 20 new works of irrigation in operation or partial operation was at the end of the year 1876-77 Rs. 1,14,95,077, made up as follows:—

A.—Direct Charges.

	Rs.
Works - - - - -	83,87,081
Establishment - -	17,52,614
Tools - - - -	1,72,005
	1,03,11,700
Add—Suspense account -	1,174
	1,03,12,874
Deduct—Receipts on capital -	12,538
Total A, direct charges -	1,03,00,336

B.—Indirect Charges.

Capitalisation - -	1,99,611
Interest - - - -	9,95,130
Total B, indirect charges	11,94,741
Total A + B -	1,14,95,077

These figures include outlay on the water works of Poona cantonment and civil station, which form part of the Mutha irrigation scheme. Deducting on this account Rs. 6,75,636, the estimated proportionate cost of the water works, the total capital outlay on irrigation works to the end of 1876-77 is Rs. 1,08,19,441.

The yearly interest on this outlay at 4½ per cent. is Rs. 4,86,875.

The cost of maintenance during 1876-77, excluding maintenance of Poona water supply, was Rs. 78,253, as follows:—

	Rs.
Works - - -	1,739
Repairs - - - -	37,660
Share of general irrigation establishment.	38,291
Tools - - -	563
Total in P. W. D. -	78,253

The acreage irrigated during 1877-78 was 24,389 acres.

The several corresponding rates per acre irrigated are:—

	Rs.
Capital outlay - -	444
Annual interest - -	20
Maintenance charges -	3·21

It should be stated that these rates are most misleading, because the bulk of the outlay is on works which have only very recently come into operation and on which the people have had no opportunity of becoming practised in irrigation or of experiencing its advantages. Also the capital outlay on works in partial operation invariably comprises the heavier portions of the work. For instance, taking the whole outlay to the end of 1876-77 as 108 lakhs, nearly 40 per cent. or 43 lakhs has been incurred on the Mutha canals, which are designed to command 93,384 acres. The entire estimated cost of this work is 56 lakhs; the area under command of the completed portion to the end of 1876-77 was 20,955 acres; thus, for an outlay of about ⅘ the total estimate, the area brought within reach of the water is less than ¼ of what it will be when the work is completed; the reason of this is, that the outlay to date comprises, besides the whole cost of the large reservoir which is to supply the entire project, the cost of several miles of canal in an incomplete state, beyond the point to which water had been admitted.

This explanation is similar to that given in para. 23, Part I. of the annual Revenue Report attached, which also contains information as to the cost of the works per acre under command. This varies from 11 to 53 Rupees per acre; and assuming that ultimately ⅓ of the area under command will be irrigated annually, the outlay per acre irrigated will be from 33 to 159 Rs.

Colonel Anderson.—Apart from canals under the Irrigation Department, minor irrigation from streams by means of dams constructed by the people themselves is very common. Tank irrigation is also very common in Dharwar. I should say that on the average the value of the crops below such works in the case of irrigation lasting up to February, and admitting of a second crop being taken, is not less than four times that of dry crops, and probably somewhat more. No general rate can be laid down, since irrigation differs much; in some cases it only lasts up to the close of the rains, and so on for different periods up to perennial irrigation, which alone allows the most lucrative crop, sugar-cane, to be grown.

Mr. Propert.—Tabular form will show capital expended, &c.

Capital Expenditure, including Establishment.	Yearly Interest.	Annual Cost of Maintenance.	Acreage Irrigation.	Several Corresponding Rates per Acre irrigated.		
				Capital.	Interest.	Maintenance.
Rs. 15,00,000	Rs. 67,500	Rs. 6,500	Rs. 5,950	Rs. 252	Rs. 11·26	Rs. 1·1

The above expenditure represents only the new irrigation schemes, for which capital accounts are kept. The old native pats or canals, bandharas or weirs, of which there are hundreds in the province, and from which a revenue of about Rs. 77,000 is derived, are left out of consideration at present.

The local value per acre of the chief irrigated crops, as given by Captain Elphinstone of the Khandesh Revenue Survey at the time of the last settlement, was as follows:—

Name of Crop.	Total Value per Acre.	Profit per Acre.
	Rs.	Rs.
Sugar-cane - - -	240	115
Plantains - - - -	62	36
Rice, best kind - - -	60	30
Vegetables - - - -	50	27
Gram - - - -	16	11
Wheat - - - - -	32	24
Jowari and bajri - - -	21	14

H. IV. Qn.12.

Bombay.

Of the above, the first four cannot be grown without irrigation; the mean value of the others is approximately as follows :—

—	Total Value per Acre.	Profit per Acre.
	Rs.	Rs.
Gram	10	6
Wheat	20	12
Bajri and jowari	10	6

Note.—I am not satisfied with the above figures, but cannot decide at present.

Madras.

MADRAS.

Mr. Sullivan.—The answer to this question, so far as the Godavari, Kistna, Palar, Strivaiguntam, and Cauvery irrigation works are concerned, will be found in the financial abstracts forwarded to the Government of India by the Madras Government with their proceedings, under date 28th July 1876, No. 1923, Public Works Department. The information is succinctly tabulated below :—

Name of the Work. 1.	Capital Outlay on the Work up to 1874–75. 2.	Interest on the Capital at 4½ per cent. 3.	Working Expenses. 4.	Area Irrigated. 5.	Charge for Interest per Acre. 6.	Working Expenses per Acre. 7.
	Rs.	Rs.	Rs.	Acrs.	Rs. a. p.	Rs. a. p.
Godavari Delta	69,10,549	3,10,974	1,53,343	513,143	0 9 8	0 4 9
Kistna	44,93,902	2,02,226	1,35,875	226,226	0 14 4	0 9 7
Cauvery	13,48,900	60,701	1,06,805	923,737	0 1 1	0 1 10
Strivaiguntam	10,60,597	47,727	—*	26,255	1 13 1	—

* Information not available.

Paddy and cholum may be taken as fair samples of the chief crops raised with and without irrigation. The estimated produce per acre is 753 Madras† measures of paddy, value, according to the average of prices obtaining during the decade ending 1875, Rupees 33. The produce per acre of cholum is estimated at 296 measures,‡ valued at Rupees 20.

Mr. Longley.—There are no canals in this district; but there are three channels§ leading off from the Cauvery, under which a large extent of wet cultivation is carried on. As these channels were constructed prior to our acquisition of the country, their cost is not known. The revenue [Fasli 1287 (1876)] under the channels was Rupees 63,219.

The cost of maintenance (on an average of the last five years) is as follows :—

—	Raja Channel.	Moganur Channel.	Komarapoliem Channel.	Total.
	Rs.	Rs.	Rs.	Rs.
Establishment	2,900	1,063	557	4,520
Repairing channels, &c.	1,736	536	337	2,609
	4,636	1,599	894	7,129

These charges are met from fees paid by landholders as the aggregate value of the customary labour and grain tax, which, from time immemorial, were contributed by them for the purpose. These grain fees were commuted in 1872 to a money payment, which constitutes a fund called "Channel Fees Fund."

The present acreage irrigated is under—

	Acres.
Raja Channel	3,825
Moganur Channel	1,535
Komarapoliem Channel	993
	6,353

The following are the rates per acre :—

Cost per Acre.	Estimate.	Repairs.	Rate per Acre.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Raja Channel	0 12 1	0 7 2	11 1 6
Moganur	0 11 1	0 5 7	7 12 6
Komarapoliem Channel	0 9 0	0 5 5	8 15 4

There is only one principal crop raised under the channels, which is paddy, the average yield of which is 1,152 measures of 136 Rupees' weight. The value of this at normal prices is Rupees 48 per acre. These irrigated lands yield on an average five wet crops in two years.

Paddy is not cultivated without irrigation, so that no comparison in the manner indicated in the question can be made.

Mr. McWatters.—The present irrigation channels were in existence when the district was ceded to the British on the fall of Tippoo in 1799. There are no data for answering the first part of this question. However, the present acreage irrigated is only 4 per cent. of the whole cultivated area.

A good crop of first-sort paddy will yield 1,400 Madras measures* per acre, and a middling crop 1,000 measures. A good crop of second-sort paddy yields 1,300 measures, and a middling crop 1,000 measures. The current price of first-sort paddy is 10·8 Madras measures, and of second sort 11·4. Omitting from consideration the value of the straw, an acre of good first-sort paddy would be worth Rupees 129, and middling, Rupees 90; and an acre of good second-sort paddy would fetch Rupees 110, and middling, Rupees 80.

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† Equal to 1,740 lb. ‡ Equal to 875 lb.

§ 1. Raja channel; 2. Moganur channel; 3. Komarapoliem hannel.

* A Madras measure contains about—
3 lb. of rice or horse-gram.
2½ lb. of husked cholum.
2¼ lb. of do. raggi.
2¼ lb. of do. cumboo.
2½ lb. (nearly) of husked paddy.

The quality of the grain makes a difference in the weights. I have ascertained the above from ordinary bazaar grain. I have found that a Madras measure of good paddy will yield 1½ lb. of rice.

(Signed) G. McW.

A good crop of cumboo yield 405 Madras measures per acre; cholum, 374; and ragi, 423. A middling crop of the same cereals yields, respectively, 242,261, and 255 Madras measures. Cumboo sells at present at 9·6 Madras measures per rupee, and ragi and cholum at 7·2.

The value of a good crop per acre would be—

	Rs.
Cumboo	40
Cholum	50
Raggi	58

and of a middling crop—

	Rs.
Cumboo	25
Cholum	36
Raggi	35

The out-turn or yield as above given has been arrived at by the Settlement Department after thousands of experiments, and are as accurate as ever such things can be. The present high prices will not continue much longer, but it is questionable whether they will ever rule as low as they did before the famine. The adoption of just rates, as between Government and the ryot, in introducing the new settlement, is a matter for grave consideration, seeing the altered state of things.

The selling prices taken as a standard by the Settlement Department have been calculated on an average of 20 years from 1845 to 1864, and are as follows:—

	Madras Measures per Rupee.
First-sort paddy	22·2
Second-sort paddy	24·
Cumboo	27·8
Cholum	20·7
Raggi	25·

Taking these prices, the value of an acre of each crop is as follows:—

			At current Prices.
	Rs.		Rs.
A good crop of first-sort paddy	63	=	129
A middling crop of first-sort paddy	45	=	90
A good crop of second-sort paddy	59	=	110
A good crop of cumboo	14	=	40
A middling crop of cumboo	8	=	25
A good crop of cholum	18	=	50
A middling crop of cholum	12	=	36
A good crop of raggi	16	=	58
A middling crop of raggi	10	=	35

Round numbers have been taken. The difference of value between the settlement prices and current are very marked. In the settlement it is proposed to make a deduction of 10 per cent. from the above prices for carriage of grain to market, and a further deduction of 20 per cent. is allowed for vicissitudes of season in calculating the assessment.

The Settlement Department seems to me to have been over-particular at first in attempting to classify soils and to ascertain to a nicety their relative productiveness under the different staples. These elaborate statistics were, however, thrown to the winds as soon as it was found that they would not serve a foregone conclusion.

The settlement rates actually introduced and about to be introduced in respect to lands under the best irrigation channels are, in my opinion, far too low.

The irrigated lands of this district pay no separate water cess.

Major H. M. Vibart.—The capital expended, to 1875–76 on—

	Rs.
Godavari Delta	69,10,549
Kistna	44,93,902

while yearly interest on them amounts to—

Godivari, about	15,61,019
Kistna	8,90,758

Annual cost of maintenance—

Godivari	1,54,751
Kistna	1,94,905

Acreage irrigated—

Godavari	5,13,143
Kistna	2,26,226

Godavari—

Capital expended per acre	13·46 Rs
Cost of maintenance	4·8 As.

Kistna—

Capital expended per acre	19·86 Rs.
Cost of maintenance	13·78 As.

When the Kistna works are complete, the sums will be greatly reduced.

It is difficult to arrive at the average local value per acre of paddy raised by irrigation.

In an irrigation experiment carried out at Chabrole, in Kistna district, in 1871–72, the gross value of produce of an acre (average of 9 acres included in experiment) was Rupees 43. The cost of cultivation, including kist (6 Rupees) was Rupees 15, leaving net value of produce 28 Rupees. This was when price of rice was 12 Madras measures for a rupee. At the present time, when rice sells at six measures per rupee, the gross value would be about 80 Rupees, and the net value Rupees 65.

During the famine, when rice was selling at four measures per rupee, the net value would probably have reached Rupees 100.

In an experiment carried on in Trichinopoly during 1873–74, the gross value of produce of an acre of paddy was found to be nearly 76 Rupees, thus making out net value about 61 Rupees. Rice was then selling at eight measures per rupee. Now, the crop would fetch, probably, 98 Rupees, the net value being 83 Rupees; and during the famine the value would have been considerably more than 100 Rupees.

The value of an unirrigated crop seems generally, as far as I can learn, to be one half that of an irrigated crop.

One result of experiments was to shew conclusively that rice could be successfully grown with a supply of water somewhat less than 2 cubic yards of water per hour per acre; and in Trichinopoly experiment the ground which produced the best crop received only 2 cubic yards artificially, and 2·64 including rain. The yield of this acre was 3,908 lb. paddy and 6,300 lb. of straw.

In many parts of Tanjore and Trichinopoly and other districts two crops are grown, and the net value of the out-turn in these cases would probably be 80 to 100 Rupees.

I. IV. Qn.13.

Question 13.—Water Rate and increased Rent, Revenue or Owner's Rate.

What is the amount per acre paid for the use of water for the chief crops by the occupier in the shape of water-rate? What is the ordinary increased rent on irrigated over unirrigated land? What is paid by the proprietor per acre in the shape of land revenue or owner's rate? Is there any reason why a proprietor, whether paying land revenue or not, the yearly value of whose lands is increased by irrigation from canals constructed and maintained at the public cost, should not contribute to the State in return for the advantage he thus obtains? What seems to be the best way of obtaining such a contribution from him; first, where the land revenue is liable to revision; secondly, where it has been permanently settled; and, thirdly, where the land is not charged with revenue?

Punjab.

PUNJAUB.

Captain Ottley.—Amount per acre paid for the use of water for the chief crops by the occupier in the shape of water-rate:—

—	Western Jumna Canal.	Bári Doáb Canal.	Upper Sutlej Inundation Canals.
	Rs.	Rs.	Rs.
Sugar-cane - -	5 per acre.	6 per acre.	1 12 0
Cotton - -	2 4 0	2 8 0	2 0 0
Jowár - -	1 10 8	1 8 0	1 8 0
Rice - -	3 0 0	4 12 0	3 0 0
Wheat - -	2 4 0	2 8 0	0 12 0
Barley - -	2 4 0	2 8 0	0 12 0
Indigo - -	2 4 0	2 8 0	1 4 0
Gram - -	2 4 0	0 12 0	1 4 0

These rates are those charged for flow irrigation. When the water is lifted on to the fields the charge made is ⅔rds on the Western Jumna Canal and ½ on the Bári Doáb and Upper Sutlej Inundation Canals of the above flow rates. The great divergence of rates noticeable on the Upper Sutlej Inundation Canals is due to the fact that the number of waterings necessary from wells to supplement the inundation irrigation had to be taken into account. Thus rice, cotton, gram, and jowar can be usually matured by the canal water alone, which in the case of wheat, barley, and sugar-cane requires to be supplemented by wells.

On the Indus and Lower Sutlej and Chenab series no water-rent as a rule is charged, the profit of the canals depending on the share of the land revenue which has been assigned to them as the result of their operations.

The following extract from the chief engineer's review of the Revenue Report for 1870–71 explains the returns of the Shahpur Inundation Canals, which, though belonging to this department, are managed by the deputy Commissioner of the district.

"75. The mode of realising the returns from these canals is, I am informed, as follows:—

"One-fourth of the produce is taken from private lands irrigated by the canal; one-half from Government waste leased to cultivators. Jhallars or machines for raising the water are charged at Rs. 16 each.

The grain or other produce obtained as above is usually sold on the spot to the grain dealers, and has yielded about Rs. 2–14 per acre irrigated."

On the Bári Doáb Canal this rate varies. For a single crop it is Rs. 1–8–0; 1–4–0; 1–2–0; 1–0–0; 0–12–0 per acre, according to the particular village which is irrigated; when two crops are taken from the same piece of land in the same year, an addition of one-half of the above rates is made for the second crop. These rates apply to whole villages, and were fixed by the settlement officer at the settlement, and no information exists in the Irrigation Department as to how these rates were arrived at, or what guided the settlement officer in their application to any particular village.

The villages on the Western Jumna Canal pay at present an enhanced land revenue on certain areas which were classed at settlement as irrigated, and the payment is made whether these areas receive water or not. Of the incidence of these rates per acre no information is available in the Irrigation Department.

When the new settlement comes into force in the districts watered by the Western Jumna Canal, an owner's rate bearing a certain proportion (½ has been suggested) to the occupier's rate will be charged, and will be leviable only on the fields actually irrigated during each season.

No reason is known in the Irrigation Department why such proprietor should be exempt; on the contrary, it would seem that such proprietors might justly be charged in proportion to the advantages so obtained.

Major E. C. Corbyn.—The amount per acre paid for the use of water for all crops by the occupier in the shape of water-rate is Rs. 2–8. The ordinary increased rent on irrigated over unirrigated land is Rs. 2–8 per acre. The proprietor pays in shape of land revenue Rs. 1–4 per acre. There is no reason why a proprietor, whether paying land revenue or not, the yearly value of whose land is increased by irrigation from canals constructed and maintained at public cost, should not contribute to the State in return for the advantages he thus obtains.

Mr. O'Brien.—Nothing is paid per acre in this district as water-rate beyond the contribution to the cost of maintenance, which has in the answer to question 12 been estimated at Rs. 0–10–6 per acre.

Rent in unirrigated and irrigated land respectively.—The rent is always paid in kind. The customary rate is higher in unirrigated than in irrigated land, because the expenses and labour of cultivation are so much lighter in unirrigated than in irrigated. On the other hand, the landlord will get rent on only one crop in unirrigated land, and on two crops in irrigated, besides that his rabi out-turn in unirrigated is something less than on irrigated.

The rate of rent in unirrigated land is $\frac{45}{100}$ of the crop, and in irrigated land $\frac{33}{100}$. Taking then the case given in the answer to the preceding question, the rent in each sort of land will be as follows:—

—	Rent in Kind per Acre.	Value of the Rent in Money per Acre.
	Mds. Srs.	Rs. A. P.
Unirrigated land - -	3 24 wheat	5 3 5
Irrigated land - -	3 12 of wheat 1 26 cotton	4 12 0 5 15 4
Total irrigated -	—	10 11 4

No owner's rate is paid by proprietors. The land revenue on unirrigated, *i.e.*, sailába, and on irrigated, *i.e.*, irrigated by both canal and well, is per acre:—

	Rs. A. P.
Unirrigated - - -	0 14 0
Irrigated - - -	1 12 0

There is no reason, as far as this district goes, why a proprietor should not contribute to the State for advantage obtained from canals constructed and maintained at the public cost, or, as in this district, by the

CH. IV. QN.

PUNJAB.

irrigators. Accordingly, it has been provided in the settlement now being made that land coming under canal irrigation during the term of settlement shall pay from 6 to 8 annas per acre, even though it has not been assessed at settlement. I can suggest no better means of levying a contribution from the proprietor than this, *viz.*, assess land irrigated by canal at settlement at a rate that shall represent the difference in value between land unirrigated and irrigated by wells only, and provide that land getting canal water for the first time during settlement shall pay a rate similar to the difference between irrigated and unirrigated rates.

Mr. Tremlett.—The Muzaffargarh canals differ, I believe, from those in other parts of India in that they are the property of the villagers; the only aid derived from the Government being, to the best of my remembrance, that it is customary to remit the revenue on land occupied by them, and waste land required for new cuts is granted free of charge when it happens to be Government soil. No rate is consequently paid to Government in any way,—at least, directly; for as large areas are cultivated by means of these village canals, which would otherwise remain waste, at any rate for many years to come, a large proportion of the five lakhs of revenue which the district yields is entirely due to these works, and is a very handsome seigniority on the Government right in the river water.

Mr. Roe.—The liability to furnish "chers," as explained in the preceding answer, takes the place of the occupier's or water-rate. The owner's rate is paid in the shape of land revenue. This was fixed at the last of settlement in a lump sum for each village Out of this the settlement officer declared so much to be due to canals. The revenue thus fixed was not liable to enhancement in case of increase of irrigation, nor could ordinarily a remission be claimed in case of a decrease, but it was stipulated that one should be granted in case of exceptional failures of the canals. The total land revenue thus declared liable to remission was Rs. 2,14,665. The irrigated area was 2,26,579. So that the average enhancement on account of canals was a little under 1 rupee per acre. Rents are all paid in kind, and there is little difference in the rate for canal and non-canal lands. But we might perhaps say that a proprietor who had been taking $\frac{1}{4}$th for an ordinary well, would, if he extended canal irrigation to it at his own expense, raise his rate to $\frac{1}{3}$. But I have known no such case of enhancement, and the case which appears to be contemplated in the latter part of this question, viz., that of an extension of irrigation at the sole expense of the tenant, is quite unknown.

NORTH-WESTERN PROVINCES AND OUDH.

NORTH-WESTERN PROVINCES.

Board of Revenue. — The difference between wet and dry rent-rates (wet rent-rates, as a rule, not varying according to the mode of irrigation, *i.e.*, whether from well or canal) may be roughly calculated to average Rs. 2 per acre. Mr. Cornwall estimates the average of wet and dry rates to be in the following "proportion for the whole district, assuming dry unmanured rent-rate to be 100."

	Per acre.
Dry unmanured	100
Dry manured	158
Wet unmanured	145
Wet manured	218

The collector of Saharanpur estimates the average difference between the rent-rate of irrigated and unirrigated land at 6 annas in the rupee.

The proprietor of canal-irrigated land pays, as owner's rate, under existing rules, one-third of the occupier's rate leviable on the land, provided that the sum really is not more than he would pay as revenue under existing settlement rules. The rule is a clumsy one. The canal department estimate the value of wheat per acre of canal-irrigated land at Rs. 32, and of gram at Rs. 18. But the occupier's rate on land growing gram and land growing wheat is the same. So, though the landowner will get a much larger enhancement over the *dry* rent on wheat-growing than on gram-growing lands, he will pay the same owner's rate in both cases. Besides, the more the owner may have to pay if the water-rate is raised, the more he will have to pay as owner's rate. This is burning the candle at both ends. The rule would be less illogical if the water-rate bore in all cases (it does in some) some proportion to the value of the crop irrigated. The Board see no reason why a proprietor, whether paying revenue or not, should not contribute to the State for an advantage he obtains, not from an expenditure of his own funds, but from an outlay incurred by the State. It may be objected, the Board think, with more reason than truth, that additional land revenue due from canal irrigation is as much land revenue as land revenue derived from land not irrigated, and that the assignee of the land revenue is as much entitled to the former as the latter. To this it may be replied that the State is entitled, in equity, as is now by law, to demand from the landowner, whether paying land revenue or not, payment, in part at least, in defrayment of the cost of a very expensive work by which he is himself largely benefited in the form either of additional profits, if he himself cultivates the land, or of enhanced rent, if the land is leased to tenants. The case would be otherwise if the tenant were protected, as the Board think he ought to be, from enhancement of rent under that section of the Rent Law which forbids such enhancement when increase in the productive powers of land, or in the value of its produce, is due to the tenant's expenditure incurred by the tenant. But, so long as the landlord can enhance his rent, owing to canal irrigation, he is justly liable to the payment to Government of that share of the additional rent which Government can claim as revenue. Again, if increase in the value of the produce, or in the productive powers of the land, resulting from the expenditure of money, of which no part has been contributed by the zemindar, is held to justify him in enhancing the rent assessed on such land, then, at revision of settlement, the contribution by the landholder towards the defrayment of expenses incurred in making and maintaining the canal can best be secured by assessing the land watered by the canal at *irrigated* rates. Where the settlement is permanent and there are tenants at fixed rates whose rents the zemindar cannot enhance, and who, therefore, appropriate all the profits arising from canal-irrigation, the tenants may be fairly called on to contribute their quota.

Colonel Brownlow.—I know of no reason why proprietors, whose lands are benefited by irrigation from canals, constructed and maintained at the public expense, should not contribute to the State in return for the advantage thus conferred on them. The best way of obtaining such a contribution seems to be by the levy of an owner's rate in permanently settled districts, and where land is not charged with revenue; also where land revenue is liable to revision *during currency of a settlement.* In the last case, the first revision of settlement should be taken advantage of to merge the "owner's rate" into the land revenue, and have done with it, except as an "indirect" annual credit to the Irrigation Department.

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NORTH-WESTERN PROVINCES.

Mr. C. C. Anderson.—(1.) The occupier's rates for water in 1876–77 were:—

	Ganges and Eastern Jumna.		Agra.		Rohilkhand.		Dún.		Bundelkhand.	
	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.
Gardens - -	3 0 0	2 0 0	4 0 0	2 0 0	2 0 0	1 0 0	3 0 0	—	4 0 0	2 0 0
Sugarcane - -	5 0 0	3 5 4	6 10 8	3 5 4	2 8 0	1 10 8	5 0 0	—	6 10 8	3 5 4
Wheat - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Barley - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Rice - - -	5 0 0	3 5 4	6 10 8	3 5 4	2 4 0	1 8 0	3 0 0	—	6 10 8	3 5 4
Maize - -	1 10 8	1 0 0	2 0 0	1 0 0	0 4 0	0 2 0	1 4 0	—	2 0 0	1 0 0
Joar - -	1 10 8	1 0 0	2 0 0	1 0 0	0 4 0	0 2 0	1 4 0	—	2 0 0	1 0 0
Gram - - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Peas - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Fodder - -	1 10 8	1 0 0	2 0 0	1 0 0	—	—	—	—	2 0 0	1 0 0
Cotton - -	2 4 0	1 8 0	3 0 0	1 8 0	—	—	2 4 0	—	3 0 0	1 8 0
Indigo - -	2 4 0	1 8 0	3 0 0	1 8 0	—	—	2 4 0	—	3 0 0	1 8 0
Opium - -	3 0 0	2 0 0	4 0 0	2 0 0	0 8 0	0 4 0	3 0 0	—	4 0 0	2 0 0

(2.) The ordinary increased rent on irrigated over unirrigated land is said to be Rs. 2.

(3.) Owner's rate is charged at one-third the occupier's rate.

(4.) No reason whatever why a proprietor, whose lands are benefited by irrigation from canals constructed and maintained at the public cost, should not contribute to the State in return for the advantage he obtains.

(5.) The levy of an owner's rate in all cases seems to be the best way of obtaining such a contribution.

BENGAL.

BENGAL.

Colonel Haig.—In Bengal water is supplied from the canals at rates varying with the term for which the land is leased for irrigation—whether for one year, three years, or five years. The water-rates now levied are per acre—

—	Five-year Leases.	Three-year Leases.	Annual Leases.
ORISSA.	Rs.	Rs.	Rs.
Rice - - - -	1-8	None	3
Rubbee crops - -	None	Do.	1 to 2
Sugar - - - -	Do.	Do.	6
MIDNAPORE.			
Rice - - - -	1-8	Do.	2-8
Rubbee crops - -	None	Do.	None
Sugar - - - -	Do.	Do.	Do.
SONE CANALS.			
Rice - - - -	Do.	1-8	2-8
Rubbee crops - -	Do.	2-4	2-8
Sugar - - -	Do.	None	5

On the Sone Canals three-year leases are given either for khureef or rubbee crops, or for both. In the case of khureef they must include the whole, and in the case of rubbee at least one-half, the irrigable area in the village. In Orissa and Midnapore, where almost all the cultivation is khureef rice, the whole irrigable area is being leased this year on five-year leases.

With regard to the latter part of question 13, I see no reason why a proprietor, whether he pays revenue to Government or not, should not be required to pay an owner's rate if his land acquires an increased value from irrigation; but irrigation is of too recent date in Bengal, and the subject surrounded with too many difficulties, for me to answer the other questions under this head.

BOMBAY.

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Colonel Anderson.—The rates on canals and tanks constructed by and now under the Irrigation Department are fixed by them, and I leave them to answer for their own works.

In the case of all old tanks and channel irrigation from streams by means of dams constructed by the people themselves, the settlement department fixes the rates, which vary in different districts and parts of districts according to local circumstances, which so exceedingly vary that it is impossible to define any general rule of rating. In Dharwar, for instance, in some parts in lands under tanks, cocoanut and areca palm cultivation flourishes, and there the rate per acre runs as high as Rs. 15, of which about Rs. 13-8 would be due to water. On rice land irrigated from tanks in Dharwar the portion of the assessment due to water would range from Rs. 1 up to Rs. 8, according to whether the irrigation admitted of sugarcane being grown in these lands or not in triennial rotation, or whether one crop of rice alone could be obtained, or whether a second crop of grain or pulse could be obtained after the rice.

Of rents proper, that is cash rents, we have not much in the south of Bombay. Half gross produce is the common rate of subletting, and there is less subletting in irrigated land than in dry crop land, but in the former the proportion of gross produce given sometimes exceeds half. It is exceedingly difficult to obtain any accurate information from the people about the terms in the occasional cases of cash rents which do exist. As a general rule the information given is wrong; the people prefer to keep affairs of this nature to themselves, and cash rents, when paid, are often mixed up with a payment also of some portion of produce.

The point in this question as to whether a proprietor, whether paying land revenue or not, should not pay water-rate if the yearly value of the lands are increased by irrigation canals constructed and maintained at the public expense, will in Bombay apparently in the main refer to holders of inam villages, though in principle it will apply to all lands. If such persons use the water they should of course pay for it whenever they use it, without waiting for revision, but the using it must in my opinion remain optional.

As regards lands paying revenue to Government, and lands entirely or partially free from payment of revenue, but situated in villages administered by Government, I would provide that after a year or two of trial a landholder should be required to state whether he accepts water for a certain survey field permanently and finally, fixing the supply which he should receive, namely, up to such a month in each year. The water assessment in this survey field would then become a permanent portion of the land revenue debited against it, and all inspection and measurement of crops, &c. would be obviated. When an irrigation work is brought into operation on land hitherto unirrigated, the lands susceptible of irrigation and desired to be irrigated should be divided up ordinarily into survey fields of about three acres and defined by boundary marks, these survey fields being shown on the map of the village. This renders it easy for the holder to bring field after field under irrigation, and water-rate permanently as his means and convenience admit. There must always, in case of a new work coming into operation, be a preliminary period of three or four years allowed to the people to accustom themselves to irrigation, and to find out what lands it suits. During this period areas actually irrigated each year must be measured off for assessment of water-rate. For the first year of these introductory years water should be allowed free, and then go on gradually-increasing rates. The scale of rates for each year should be given all publicity before the first year.

As regards inam villages the above course would hardly be feasible, as it could not be worked without the consent of the inamdar, which would rarely if ever be given. In such villages the simplest course would be to allot a certain supply of water at a certain lump payment agreed upon with the inamdar, and leave the detailed management of it to him. As regards permanently settled tracts, one or the other of the above courses would equally apply, according to the area of each estate.

The charge that agriculturists use more water than is necessary is commonly made. I doubt the entire truth of this charge. Too much water does more harm than good. Ryots know how much water they practically require. Doubt possibility of giving out water in detail by module. Contract system not practicable except on a large scale, such as supposed in case of inam villages above, and above all not compulsorily.

Excepting on canal works, water-rates in Bombay are fixed under the Settlement, and for the period of the Settlement, and can only be increased under the terms of the guarantee if Government should improve the water supply on irrigated lands, or if additional land is brought under irrigation from Government water.

Mr. Hughes.—A statement (Appendix E. of the Budget) showing the water-rates in force on each of the new works in Guzerat and the Deccan is attached.

The rates are generally arranged in four classes, according to the quantity and value of the water. Thus—

Class I. comprises sugar and other perennial crops.

Class II. comprises eight months' crops, such as ground-nut. The eight months' rate covers the eight months of irrigation commencing in June. A cultivator may raise two crops during this period for the eight months' rate.

Class III. comprises four months' crops, such as wheat, gram, &c.

Class IV. comprises monsoon dry crops, jowari, bajri, and inferior rice.

On most of the works there is in addition a special rate for irrigation for the four months from February to May, when the water is very scarce and consequently valuable.

The rates for Classes II., III., and IV. are the same on nearly all the works, namely, Rs. 4, 2, and 1 per acre respectively. The rate for Class I., perennial crops, varies. On the first opening of a work it is generally fixed at Rs. 8 per acre, and this rate usually remains in force for five years, when it is increased to Rs. 10. On four of the works in Satara, which have been in operation for 10 years, and where the demand for perennial irrigation is greater than the supply, the rate has recently been raised to Rs. 18 per acre. On the Mutha Canal, in the vicinity of Poona, the rate is also Rs. 18. In these cases only half the rate, or Rs. 9, is chargeable for the first year on land not heretofore irrigated. On the Jamda Canal in Khandesh the rate is Rs. 16. On all the other works it is either Rs. 8 or Rs. 10.

The existing rates then are usually as follows :—

Class I. - - -	Rs. 8 to Rs. 18.
Class II. - - -	„ 4
Class III. - -	„ 2
Class IV. - - -	„ 1

The special rate for irrigation between February and May is either Rs. 6 or Rs. 4. Half rates are charged when the water is lifted on to the land, and half the perennial rate is levied when the supply is insufficient and wells have to be resorted to during the hot weather.

The average rate assessed under these scales on the 24,389 acres irrigated during 1877–78 is Rs. 3·42 per acre. These rates, more especially that for perennial crops, are generally regarded by persons familiar with the irrigation system of Northern India as exceedingly high, but they overlook the fact that in this presidency, where the revenue system is ryotwari, the water-rate charged by Government is the total charge the cultivator has to pay for the water. I find it stated that in the North-West Provinces, with a water-rate of Rs. 5 per acre for sugar, cultivators pay for sugar-cane about the following proportion—

Rent to landlord for sugarcane, say	Rs.	16	per acre.
Rent to Government for canal water	„	5	„
Total - -	„	21	„

A cultivator in this presidency irrigating from one of our new canals would under similar circumstances pay—

Water-rate from - -	Rs.	8 to 18	per acre.
Land assessment, say -	„	2	„
Total, from	Rs.	10 to 20	„

The rate of Rs. 2 for the land assessment is an assumed one, but the instances in which it is exceeded are not many.

Under the ryotwari system there are no "owners" as distinct from "occupiers," and consequently no "owner's rate." Where separate water-rates are levied for the use of canal water, there is no increased rent, that is, assessment on the land.

But the yearly value of land is increased by the construction of an irrigation work which brings the means of irrigation within its reach. The benefits which a work of irrigation confers on the land it commands are described at some length in the accompanying memo. by Colonel Fife, and the principle of enhancing the land assessment paid by the ryots in consideration of these benefits has been fully recognised by Government, but in the present state of the law it is only feasible to make such enhancement at the time of the revision of the land-revenue settlement. The question of the method of fixing the addition to be made to the survey rates on account of these indirect advantages has been considered by the survey officers. The Survey Commissioner, in reporting on the subject, admits "the difficulty of "making a regular valuation of the benefits accruing

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" from the influence of irrigational works, but that " there are indirect advantages of a certain kind, and " which are set forth in Colonel Fife's report, must " be admitted, and all that is required to be done is " to take them into account in a general way," and he considers that " in future the question of indirect " advantages should be separately treated and a specific " addition made [to the rates] on that account."

These proposals have been approved by Government, and have already been given effect to in the revision settlement of the land under the Palkhed Canal in Nasik and in the settlement introduced into one of the villages transferred from the Nizam's government under the Bhatodi tank in Ahmednagar. Particulars of these cases will be found in paras. 179 and 292 respectively of the Revenue Report for 1876-77 attached.

Government in the Revenue Department have also ordered that—

" Survey officers should, in future, give notice to the holders of land in the vicinity of canals under construction or about to be constructed, in a district in which a survey settlement is about to be introduced, that on its completion they will be liable to increase of assessment not only when they take water, but also when they are benefited by the canal through percolation or other advantage."

And also that—

" Where the rates have already been sanctioned and given out, no increased assessment can be imposed in consideration of the benefit conferred on the land by its proximity to an irrigation work. When future settlements are introduced, however, in places where there is a probability of a canal being constructed, due notice should be given that the rates will be liable to enhancement on account of indirect as well as direct benefits accruing from it."

Mr. Propert.—There are two systems of assessment—

(1.) That settled by the Revenue Survey. This is a water-rate per acre irrespective of the crops grown, varying from Rs. 5 to Rs. 18 per acre. The former rate is levied in the case of water supply lasting only through the cold weather, and where the bandhara or weir is not permanent. The higher rates are levied in the case of an ample perennial supply, first-class soil, and permanent weirs.

(2.) The rates on new irrigational works. These vary from Rs. 10 to Rs. 15 for perennial crops, and from Rs. 2 to 4 rabi, rice, and garden crops. Rupee 1 per acre for monsoon crops, such as millets, oilseeds, &c. The above rates represent the increased rent on irrigated over unirrigated land. In the case of Khandesh, proprietors are represented by a few jahagirdars, who as a rule pay Government a quit-rent yearly. Government, however, may be considered as almost the sole proprietor of all lands irrigated by the new projects. In districts where proprietors are ordinarily to be found, if they pay land revenue, I should say that the water-rate might be imposed in addition to the ordinary revenue demands. In the case of permanent settlements and proprietary land not charged with revenue, I should think that legislation would be necessary to enforce payment of water-rate.

MADRAS.

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Mr. Sullivan.—(*a.*) The following are the standard charged rates for water from Government sources of irrigation :—

	Rs.	A.	P.
For a single crop, per acre -	4	0	0
For second crop on the same land, per acre - -	2	0	0
For special crops, such as sugar-cane, betel, &c., requiring irrigation for a longer period than an ordinary wet crop, per acre - -	6	0	0
For irrigation of dry crop, per acre - - -	2	0	0

The above rates are charged in addition to the assessment payable on dry lands when such lands are brought under irrigation by means of water supplied from Government sources. But under the old irrigation works of the country there is a vast extent of land permanently classed as wet and bearing a consolidated wet assessment, *i.e.*, the land assessment and the water-rate are merged, and the figures given in the appended statement would at first seem to indicate the extreme difficulty of determining with any approach to accuracy the money value of water applied to land throughout the Presidency. The two columns give the average rate of assessment per acre for unirrigated and irrigated land, respectively, in all districts except the Godavari and Kistna, and the difference between them may be assumed to be the value of the water in each locality. It will be observed, however, that the variations in the wet rates are very considerable. They range from Rupees 2-4-0 per acre on the Nilgiri to Rupees 9-7-10 in Tinnevelly, and excluding the former district, the circumstances of which are exceptional, the figures show that where the assessment on the dry land is lightest (whence it may be inferred that the quality of the soil is inferior) there the value of the water is the greatest, and curiously enough the average water-rate of the 17 districts (that for each being calculated in the manner above indicated) comes out within a trifling fraction as Rupees 4, the amount levied under the water-rate rules in addition to the assessment on all lands irrigated from Government sources which are not permanently classed as wet.

AVERAGE DRY AND WET RATES.

Districts.	Average Dry Assessment per Acre.			Average Wet Assessment per Acre.		
	RS.	A.	P.	RS.	A.	P.
Ganjam - - - - -	1	4	5	2	14	4
Vizagapatam - - - -	1	2	1	5	3	11
Nellore - - - -	1	2	9	5	7	4
Cuddapah - - - -	0	12	5	6	12	8
Bellary - - - - -	0	9	11	4	15	2
Kurnool - - - -	0	14	7	6	2	7
Chingleput - - -	1	6	7	3	10	5
North Arcot - - - -	1	6	2	5	12	4
South Arcot - - -	1	11	3	5	5	5
Tanjore - - - - -	1	3	11	4	13	11
Trichinopoly - - - -	0	14	11	4	2	9
Madura - - - -	1	4	6	4	2	9
Tinnevelly - - -	0	12	7	9	7	10
Coimbatore - - - -	0	14	3	7	5	8
Nilgiri - - - -	0	9	4	2	4	0
Salem - - - - -	1	2	1	5	10	3
Malabar - - - -	1	9	1	3	0	1

No reason whatever why proprietors should not contribute to the State in return for the increased value of their land conferred by irrigation from canals constructed and maintained at the public cost. Act VII. of 1865 (Madras) makes ample provision for the levy of such contribution from all descriptions of landholders.

Lieut.-Colonel Mullins.—*Water-rates, rent, &c.*—The particulars of water-rates are subjoined :—

GODAVARI AND KISTNA DELTA SYSTEMS.

—	Per Acre irrigated.					
	Flow.			Lift.		
	RS.	A.	P.	RS.	A.	P.
Single wet crop	4	0	0	3	0	0
Second wet crop on irrigated land	4	0	0	3	0	0
If compounded for two crops for a term not less than five years	6	8	0	4	14	0
Single dry crop	2	0	0	1	8	0
Second dry crop on irrigated land (if not compounded)	2	0	0	1	8	0
Sugar-cane, betel plantations, and other garden produce remaining on the ground for the time of two crops	8	0	0	6	0	0
Do. if compounded for not less than five years	6	8	0	4	14	0
Dry crop on land for which irrigation has never been supplied, or, having been once supplied, has been since continued	2	0	0	1	8	0

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Sugar-cane, betel leaves, cocoanuts, plantains, saffron, fruit-trees (various)	12	0	0	8	0	0
Rice, field-sown	6	0	0	4	0	0
Rice on bedded and bunded fields—						
First year	3	0	0	2	0	0
Second year	4	0	0	2	10	8
Third year	5	0	0	3	5	4
Subsequent years	6	0	0	4	0	0
Garden raggy, onions, chillies, sweet potatoes, tobacco, maize, garden korra, indigo, brinjals, yava (wheat), cummin, bariga, mentilu	4	0	0	2	10	8
Cholum, field raggy, field korra, field tobacco, field chillies, cotton, gram (various), oil-seeds (various), areca	2	0	0	1	5	4
For a series of crops	6	0	0	4	0	0
For first-class crop, matured partly from canal and partly from other sources	1	8	0	1	0	0
For second-class crop, matured partly from canal and partly from other sources	1	0	0	0	10	8
For irrigation from canal after 1st January, rice excepted	1	0	0	0	10	8
For water supplied to store in a tank	1	0	0	—		
If conveyed to a crop, the same rates as if supplied direct from canal. If not, conveyed free						
Crop on land cultivated under the tank supplied during any of the five years previous to opening the canal	Free.			—		
Crop on other land in the tank ayacut	The difference between the wet and dry assessment.					
Crop on land outside the ayacut	Same rate as is supplied direct from the canal.					

No water-rates in force in the other irrigation systems of the Presidency, the water-tax and assessment being consolidated.

There is in the Irrigation Department no information as to the ordinary increased rent on irrigated over unirrigated land. In this Presidency, so far as has come under notice, the practice has been—

(1.) For a Zemindar to pay peishcush or quit-rent for his estate;

(2.) For the total wet ayacut, or land classed as wet, to be supplied from Government canals free of charge, irrespective of the previous average or even maximum extent of irrigation during any immediately preceding period, where the old sources of irrigation are superseded by canals. The instances referred to are the Nidadavol and Baharzalli Zemindaris in the Godavari; and,

(3.) For the Zemindar to pay the ordinary water-rates on lands irrigated in excess of the former total ayacut.

No instance of enhancement of the peishcush or quit-rent has come under notice. There would probably be great difficulty in obtaining any payment beyond the water-rate from Zemindars, even could it be proved that their estates had been generally benefited by the construction of irrigation works, because the peishcush is not liable to enhancement.

Mr. Longley.—The lands under the Cauvery Channels pay a consolidated wet assessment, and no special water-rate is levied, except in the case of dry lands temporarily cultivated, in which case water-rate is levied according to the following scale:—

	First-Class Tanks, River and Spring Channels.		
	RS.	A.	P.
(*a.*) Water-rate for a single wet crop raised on dry lands, per acre	4	0	0
(*b.*) Second crop on the same land per acre	2	0	0
(*c.*) For sugar-cane, betel, cocoa-nuts, plantains, &c., requiring water longer than ordinary dry crops, per acre	6	0	0
(*d.*) For dry crops watered, whether first or second crop, per acre	2	0	0

Fees for the maintenance of the channels are paid at the following rates:—

	RS.
Direct irrigation per acre	2
Baling do.	1

The ordinary rent paid under the channels is—

Channels.	Per Acre.	
	Rent in kind, Madras Measures.	Rent in Money.
		RS.
Raja Channel	1,152	48
Moganur Channel	768	32
Komarapoliem Channel	960	40

The average rates paid by the proprietor per acre in the shape of land revenue or owner's rate are—

	Rs.	A.	P.
Raja Channel, per acre	11	1	6
Moganur do.	7	12	6
Komarapoliem do.	8	15	4

There is no reason why persons deriving increased benefit by irrigation from canals, &c., maintained at public cost, should not pay for the additional advantages; but Inamdars holding lands under Cauvery Channels do not pay any tax for irrigation, as they are entitled by their Inam to the same (irrigation) free. Zemindari ryots pay consolidated wet assessment on their lands to Zemindars (and Government ryots to Government), as the assets on which the peishcush (payable by Zemindars) was fixed included the same.

The following are the rates per acre—

Cost per Acre.	Estimate.			Repairs.			Rate per Acre.		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Raja Channel	0	12	1	0	7	2	11	1	6
Moganur	0	11	1	0	5	7	7	12	6
Komarapoliem Channel	0	9	0	0	5	5	8	15	4

There is only one principal crop raised under the channels, which is paddy, the average yield of which is 1,152 measures of 136 rupees' weight. The value of this at normal prices is Rupees 48 per acre. These irrigated lands yield on an average five wet crops in two years.

Paddy is not cultivated without irrigation, so that no comparison in the manner indicated in the question can be made.

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Mr. W. Wilson.—The water-rates in the Kistna and Godavari districts are as follows:—

(1.) For a single *wet* crop, Rupees 4 an acre.

(2.) For a second *wet* crop on irrigated land, Rupees 4 an acre, provided that the cultivator may compound for irrigation for two crops for term of years not less than five, for Rupees 6–8–0 an acre.

(3.) For a second *dry* crop on irrigated land, Rupees 2 an acre, except where the land-holder has compounded under Clause 2.

(4.) For sugar-cane, betel, plantains, and other garden produce remaining on the ground for a time of two crops, Rupees 8 an acre, provided that the cultivator may compound under Rule 2 for Rupees 6–8–0 an acre.

(5.) For a dry crop grown on land for which irrigation has never been supplied, or having once supplied has since been discontinued under Rule 3, Rupees 2 an acre, whether the crop be a first or second crop.

(6.) When the water used for irrigation cannot be obtained without raising it by baling or mechanical contrivances, a deduction of one-fourth of the water-rate will be made.

The same principles are adopted in charging for water-supply to lands not classed as wet which receive water from tanks and water-courses in the uplands of these districts, and under all other tanks in the Presidency, with certain exceptions. The assessment of irrigated lands is not always greater than that of unirrigated lands. The consolidated assessment of the inferior classes of irrigated land is generally lower than that of the better classes of dry land.

The following table shows for the districts settled by the Revenue Settlement Department the average incidence of wet and dry rates. Taking only the Kistna and Godavari Deltas, where land assessment and water-rate are separated, the average of the former is for the Kistna Rupees 1-14-11, and for the Godavari Rupees 2-6-8 an acre:—

Districts.	Average Rate per Acre.					
	Wet.			Dry.		
	RS.	A.	P.	RS.	A.	P.
Ganjam	3	5	0	1	4	5
Godavari	6	0	7	1	12	9
Kistna	5	14	1	1	8	5
Nellore	5	5	0	1	3	7
Cuddapah	6	7	2	1	2	4
Chingleput	3	8	4	1	2	8
Trichinopoly	4	4	2	0	15	5
Tinnevelly	6	10	2	0	11	2
Kurnool	5	14	3	0	15	4
Salem	4	8	11	1	2	3
South Arcot	5	8	7	1	13	5

If lands are increased in value by irrigation, it is to be supposed that they are irrigated, and that the proprietor pays for their irrigation, unless he is entitled to it for nothing.

Mr. Crole.—The Madras Irrigation and Canal Company's canal is the only work of this kind in Kurnool. Capital expended to date* is Rupees 1,61,01,982. The yearly interest (guaranteed) is Rupees 4,99,833, while the canal earned in 1875–76† only Rupees 57,633. The annual cost of maintenance is Rupees 1,47,605 on the average of six years ending 1876–77. Irrigated acreage of all kinds was 14,763 acres for 1875–76. The corresponding capital and interest per acre is Rupees 1,090–10–0 and Rupees 33–12–0, respectively. The local value per acre of chief crops irrigated is paddy Rupees 19, raggi Rupees 17, cholum Rupees 12–8–0.

Paddy cannot be raised without irrigation. Cholum raised without irrigation is a more valuable crop.

The water-rate is Rupees 6 per acre for paddy, Rupees 4 for garden crops, Rupees 2 for crops requiring only occasional floodings, and Rupees 12 for sugar-cane and betel gardens (*vide* enclosed extract from Canal Water-rate rules). The ryot pays from Annas 4 to Rupees 5 per acre for land-revenue. The ryots (landlords) do now pay half the net produce to Government. Increased value conferred by irrigation works is taken into consideration in the settlement of such holdings as are thus "permanently improved." No further contribution could fairly or in good policy be exacted from the ryot.

Revised Water-rate Rules.

I. Before the 1st day of April in each year the agent of the company shall inform the collectors of districts what portions of each village under the influence of the canal he is prepared to irrigate during the ensuing irrigation season, and the collectors shall have the above information duly posted up and publicly notified in each village concerned, through the curnams, before the 1st day of May following. The canal administration shall, at the same time, send a notice to the curnam of each village in anticipation of the collector's order.

II. No canal water shall be used for irrigation purposes unless an application made verbally by the ryot be previously registered by the village curnam, or else the ryot must first make written application through the canal officers to the village curnam. Separate application should be made for water required for first and second crops. The canal officers will be at liberty to supply water immediately on the receipt of applications; and these, on transmission to the curnams, will be completed as regards revenue details by them and transmitted to the tahsildars.

III. Applications will be registered for whole revenue fields, or recorded sub-numbers of survey fields, however small they may be; except for crops classed as double, water will not be supplied for arrears less than one acre in fields of larger extent. The curnam is authorised to subdivide family holdings or joint holdings of putta amongst the individual owners for the purposes of irrigation, provided none of the family or putta-holders make objection thereto, and will duly report such subdivisions to the tahsildars.

IV. If water is taken without application or registration, the cultivator will not be entitled to remission, and he will be charged on the portion irrigated, provided that the charge shall never be for less than an acre, except in the case of fields, the recorded extent of which is less than an acre, when the charge shall be on the whole field; he will further be required to pay a fine of 8 Annas an acre or fraction of an acre irrigated for the first offence, 1 Rupee an acre or fraction of an acre for the second offence, and thereafter such an addition, not exceeding double the rate, as may be considered equitable by the settling officers.

The canal officers are entitled to inspect fields without damaging the crop; and the holders are bound to permit the inspection and measurement of canal officers equally as of revenue officers.

In cases of surreptitious irrigation the rate to be levied will be that which is most favourable to the ryot amongst the rules applicable to his case.

V. The company do not, except under their tanks, guarantee a supply of water beyond the 31st December; but, so far as water may be available in the Toomboodra or other streams feeding the canal, it

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[*] 30th June 1877.

[†] This is the latest year for which I have figures for both districts complete. It is, besides, the latest normal year. The canal revenue increased very much in 1876–77 and 1877–78 on account of dry crop watered during the famine, but during the present season (1878–79) these figures will not be maintained. In point of fact, the revenue will, in all probability, be much the same as in 1875–76.

will be supplied to all except first-class single crops at the rate of 1 Rupee a month, so long as the supply lasts, until the annual closing of the canal, which will be notified not later than the 1st December.

VI. The full rate per acre charged for water on application shall be as follows :—

Clause 1. First-class crops requiring continuous supply—

	Rs.
First crop - - -	6
Second crop - -	6

These crops include rice and the following double crops, viz., sugar-cane, betel leaves, coacoanuts, plantains, saffron, fruit-trees (various).

NOTE.—The rate for crops classed as double will be on the area of such crop irrigated, whether with or without permission, independent of the area of the field.

Clause 2. In future years the rate of first-class single crops when raised on fields so levelled and bunded that quiet water will stand at a depth of a finger to a hand-breadth over a whole bed will be for the first year of cultivation Rupees 3, for the second year Rupees 4, for the third year Rupees 5, an acre, single rate. After the third year full rate will be charged for crop irrigated on the same fields.

Clause 3. Second-class crops requiring frequent floodings, Rupees 4.

These crops include garden ragi, onions, chillies, sweet potatoes, tobacco, maize, garden korra, indigo, brinjals; yava (wheat), cumminbariga, mentilu.

Clause 4. Third-class crops requiring occasional floodings, Rupees 2.

These crops include cholum, field ragi, field korra, field tobacco, field chillies, cotton, gram (various), oil-seeds (various), areca.

Clause 5. A "crop" includes one, two, or more crops sown together in intermediate rows at the same time. Double crops or those requiring irrigation for more than six months, except indigo, pay double the rates specified for their class, unless supplied after 31st December, at the monthly rate.

Clause 6. For a series of any crops, rice excepted, raised from the beginning of the season up to 31st December, Rupees 6.

Clause 7. For a series of any crops, rice excepted, raised from 1st of January to the closing of the canal, per month Rupee 1.

Clause 8. If water is not supplied for the whole time the crop is on the ground and the crop is matured from other sources, the charge on crops of the first-class shall be at the rate of Rupees 1-8-0 and on crops of the second-class at the rate of Rupee 1 per month of canal irrigation. This clause is intended to apply to crops supplied from the canal after other sources have failed as well as from other sources after the canal irrigation has ceased.

Clause 9. For water supplied to a tank for storage for the purposes of irrigation, the rate shall be 1 Rupee for 1,440 cubic yards, the quantity being measured at the supplying sluice. Water shall be supplied as above on the requisition of the collector or tahsildar.

Clause 10. If water is baled the charge shall be two-thirds of the full rate.

Clause 11. Land irrigated by canal water springing up in a field and not conveyed over the surface will not be charged. Surface irrigation by canal leakage water conveyed to lands for purposes of irrigation within the limits of the company's distribution channels, or flowing through cuts or holes in a bund under circumstances within the control of the cultivator, will be charged the same rates as are laid down for similar cultivation supplied directly from the canal channels.

Clause 12. No charge will be made for water passed as surplus into any water-course or natural channel from which, before the construction of the canal, a first or second class crop had in time past by any means being irrigated. The position and extent of lands so irrigated and the number of crops thereon irrigated shall be ascertained and recorded, and areas and crops in excess of this shall be liable to the canal water-rate if regularly and intentionally supplied by the company.

Clause 13. No charge shall be made on any land cultivated within the preceding five years under tanks, the supply or distribution of which is necessarily affected by the canal. Additional cultivation under Government works of irrigation due to the influx of canal water shall, if such extension be within the company's scheme of irrigation, be charged for at the same rates as the other cultivation within the ayacut, the difference between the consolidated wet assessment and the dry assessment being credited to the company. The ordinary canal rates will be charged beyond that limit.

VII. As a general rule, applicants will be bound to pay for all the land applied for. In special cases where, from sudden illness or loss of cattle or other causes beyond his control, the ryot is prevented from cultivating the land, he may, at the discretion of the settling officers, be allowed to withdraw his application. If cultivation has been commenced he may be charged only for the water used. Ryots should be permitted to withdraw their applications for water, subject to subsequent approval by the settling officers.

VIII. Remission of water-rate, either wholly or in part, will be granted for failure of crops in cases where that failure is caused by excess or deficiency of water due to defect of works and shortcomings on the part of the canal administration, and not to neglect on the part of the ryots. No remission will be granted for failure of crops due to deficiency of water between the 1st January and the re-opening of the canal after the annual closing.

IX. Remissions will be granted, at the discretion of the settling officers, for rocky ground or land otherwise unfit for wet cultivation.

X. In exceptional cases, such as failure due to "choudu," excessive rains, or other cause beyond the company's or ryot's control, a similar indulgence may be granted at the discretion of the settling officers.

XI. No claim to remission for any case of loss or damage of crop shall be admitted unless written timely notice is given to the village or taluk authorities, so as to secure examination on the spot before the damaged crop is removed. The curnam will at the same time give prompt intimation of the claim to the company's overseer or the resident engineer.

XII. All applications, whether made by the ryots verbally or through the canal officers, shall be recorded by the curnam, if possible, on the same day they are received in a register (Form B), but applications to cultivate less than the minimum allowed by the rules must be refused. Cultivation, when applications have been refused or not made, will be separately registered by the curnams.

XIII. The register of applications shall be closed on the 28th of the month, and an extract thereof despatched to the taluk cutcherry so as to reach it it on the 1st of the following month. All cultivation without application should be shown at the foot of the register with the necessary remarks.

XIV. The tahsildar, or, in his absence, the taluk sheristadar, shall prepare an abstract thereof and despatch it so as to reach the collector on or before the 5th, who will forward it on to the company's chief engineer.

XV. The curnam shall further keep a book showing the detailed measurement of the area applied for. The revenue inspector should examine, during his visit to the village, the accuracy of the measurements thus recorded, and make the necessary corrections in red ink.

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XVI. The register of applications kept by curnams shall be open for inspection to officers of the company, who may enter any remarks they think proper or make extracts thereof. Similarly, the curnams and other revenue officers may inspect registers kept by the company's overseers and surveyors. Where there is a difference of opinion between the curnams and the company's overseers, either in regard to damage or irrigation, the same shall be reported to the revenue inspector in view to the necessary inquiry being held on the spot.

XVII. The curnam and the reddi shall go along the irrigation channels and inspect the cultivation as often as necessary, and at least twice a month, and enter the extent in the register (Form C) kept for the purpose, with any necessary remarks regarding use of water without previous application, damage to crops, &c.; an immediate report of any damage shall be sent to the nearest company's overseer or engineer and to the revenue inspector of the range. On receipt of this report the revenue inspector shall at once visit the spot, together with the company's overseer if possible, and report the result of his inquiries to the tahsildar. In more important cases the tahsildar or sheristadar shall conduct the investigation in person.

XVIII. The curnam shall, at the close of the season, prepare an account (Forms D and D-1), showing the total land applied for, the portion irrigated, and any loss of produce from causes indicated in rules VIII., IX., and X., and submit the same to the taluk cutcherry not later than the 1st of April in each year.

XIX. The settling officers shall consist of the collector of the district and the manager of the canal, or of an officer deputed by either to act for him. They shall decide all facts pertinent to claims made by ryots for remission of water-rate due to damage done by the canal water or works, or to appeals against the rates or measurements; and shall be competent to decide on the correct amount of water-rate chargeable and on the remission thereon, and also to arbitrate, if so desired by the claimant, on all cases of claims for damage made against the canal. It shall be open to either the Government or the company, as represented by their local officers, to claim a reference of the question to arbitration, in which case the collector and the company's chief local officer shall each nominate one arbitrator, and the two nominees shall elect an umpire. The decision of the arbitrators shall be final. Where settling officers are deputies their proceedings are subject to the confirmation of the collector and the manager of the canal.

XX. Notice of the time and place of settlement of each village shall be tom-tomed through the village at least 10 days before the date fixed.

XXI. With a view to facilitate the registration of applications for water and the subsequent transaction of the company's business, 6 pies in the rupee of the adjusted gross demand will be paid by the company to the curnam and reddi of the village in remuneration for their trouble in such proportions as the collector may determine.

XXII. A table of water-rates and remissions in accordance with the above rules in English and Telugu, and a printed copy of Rules II. to XI. and XX. to XXI. in Telugu, shall be posted by the company in every village and hamlet whose land is, or will be, affected by irrigation.

Mr. Foster.—The rates paid to Government for ancient water for an ordinary wet crop, such as paddy, &c., is Rupees 4 per acre; but in the case of sugarcane and betel leaf, which remain on the ground for double the time of an ordinary crop, the rate is Rupees 8. Dry crops irrigated pay Rupees 2 per acre. We may take it that the rent on irrigated land may be double that on unirrigated. The rent paid by the proprietor per acre in the shape of land-revenue varies from four annas to 10 rupees. There is no reason why a proprietor should not contribute to the State in return for the advantages he obtains from canals constructed and maintained at the public cost, but there is considerable difficulty in making him pay. If we charge him either extra rent or water-tax, he transfers the burden to the cultivator; very seldom does he think it worth while to spend anything on the land. The result of this is, either that the land becomes impoverished for want of improvement, or the cultivator gets into the hands of the sowcars, who derive all the benefit. It seems to me there is a marked distinction between the generality of the actual cultivators in zemindari lands and those in Government lands: from this remark I exempt those zemindaris which have been under the management of the court of wards. In the case of lands where the land-revenue is not liable to revision, I know of no other plan of obtaining payment for water but by charging a water-rate; and this, as I have said before, is sure to be transferred by the proprietors to the cultivators. Where the land-revenue *is* liable to revision I would prefer, instead of a water-tax, a fixed consolidated assessment, but I would have it revised oftener than is at present contemplated. Where the land is not charged with revenue a water-rate is the only way.

Mr. McWatters.—The irrigated lands of this district pay no separate water-cess.

Channel lands are usually rented on varam tenure. The tenant or actual cultivator pays the proprietor or Government pattadar from ½ to ⅔ the gross produce. The proprietor pays the Government kist, and the tenant gets the straw. In some places the custom has grown up of the proprietor further bearing half the expenses of weeding and transplanting, which average 1½ Rupees per acre. Any little manuring that is done in the shape of scattering wild indigo, &c. over the fields is paid for by the tenant.

Channel lands are also rented for a fixed quantity of grain per acre, no matter what the gross out-turn may be.

Calculated as in the previous question, the rent value at current prices of irrigated land varies from 40 to 80 rupees per acre, and at settlement prices from 20 to 40 Rupees well lands, now classed as dry or unirrigated, and punjah or dry lands proper are rented at half the gross varam or *out-turn*. Punjah lands are also rented for a fixed money-rate, varying from twice the Government kist or revenue. The rent value at current prices of unirrigated land varies from 12 to 25 Rupees an acre, and at the settlement price sfrom 4 to 9 Rupees an acre. The rent value of well lands is much the same as channel lands; but this sort of land is seldom rented. These different rent values per acre may be placed side by side for easy reference:—

—	Calculated at current Prices.	Calculated at the Settlement Prices.
	Rs. Rs.	Rs. Rs.
Irrigated lands, including well lands.	40 to 80	20 to 40
Unirrigated lands - - -	12 to 25	4 to 9

The highest of these calculations is rather under what the best channels lands rent for. I notice a tendency in proprietors or puttadars lately to exact, as a rule, ⅔ the gross out-turn, probably owing to the extraordinary high prices.

The land-revenue on *irrigated* land is to vary according to the new *settlement* from Rupees 12-8-0 to Rupees 2-8-0 an acre. The existing rates are about 97 in number, and average from Rupees 1-7-2 to Rupees 20-13-0. The settlement dry *rates* are to vary *from* 6 annas to Rupees 1-12-0. There are 138 existing rates averaging *from* Annas 3-6 to Rupees 1-9-0.

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I am decidedly of opinion that a proprietor, the value of whose land is increased by reason of a Government irrigation work, should contribute to the State for the advantage he receives.

Where the land-revenue is liable to revision the assessment might simply be enhanced; in the other two instances a separate water-rate would be the easiest way of meeting the difficulty.

QUESTION 14.—COLLECTION OF CANAL DUES. DISTRIBUTION OF WATER.

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In what way, and under what law, are the canal dues recovered in your district? Has there been found to be any difficulty in applying the law in any particular, and if so, how? And what better system can be suggested? It is commonly said that water is used in too lavish a manner by agriculturists when the charge is made on the irrigated area, or otherwise than by the quantity supplied. Is this the case, and what remedies can be applied? Will raising the water-rate have the effect of preventing this? To what extent is this likely to have a tendency to throw the poorer crops out of cultivation, or to confine irrigation to the more paying crops? Is water charged for by quantity, and can this be done? Is it ever charged for on a contract system, a whole village or the proprietors or cultivators of a certain portion of the village lands paying a lump sum periodically for the water supplied to those lands through a given aperture? Is this system a good one? What are the difficulties attending it? Where it is adopted, what arrangement is made for distributing the water among the cultivators? Have complaints practically arisen where the system has been in force, and how could they best be guarded against? Does there appear to be any objection to making such a system of contract compulsory where the general advantage of the cultivating community calls for increased economy in the use of a limited supply of water?

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Captain Ottley.—The law under which the demand is made and the dues collected is Act VIII. of 1873.

The manner in which the demand is ascertained and scheduled is as follows:—

The fields irrigated are noted in a book provided for the purpose, by the chowkidar (canal patrol) during the irrigating season. These books are checked from time to time by the superior native revenue establishment, and by the European officers of the division. The entries are moreover attested by the seals of one or more of the village headmen.

Towards the close of each irrigating season, a staff of amins (measurers) are sent out into the irrigated tracts; these men ascertain the area of each field which has been watered, either by means of village maps (where these exist) or by actual measurements with the chain; they also note the description of crop growing in each field. They are accompanied by the chowkidar who had noted the irrigation, the village patwárí (accountant), the lambardár (headman of the village), and the owners of the fields.

The area of the field and description of crop is entered on the spot in the field-measurement papers (khasrah); from this the demand statement (khataoni) is compiled.

This latter document contains the detail of the demand from each individual cultivator; a copy is deposited with the patwárí, and the original is sent to the deputy Commissioner and forms his warrant for the collection of the season's dues.

It should be added that a considerable per-centage of the measurements made by the amins are checked under the orders of the executive engineer by his assistant engineers, and by the deputy magistrates, and the Zillahdárs or native revenue officials. Independently of this, every complaint, whether of over-measurement or of incorrectness in the entry of the class of crop, is investigated on the spot by a superior officer.

There has been as yet no difficulty experienced in applying the provisions of the Act above referred to, and as far as the Irrigation Department is concerned the present system has been found to work smoothly and well.

There can be no doubt that, when special precautions are not taken to prevent it, the cultivators do use the water in too lavish a manner. The only remedy which at present seems possible, and which is now being tried, is a reduction in the size of the outlets, and a consequent diminution of the volume of water allotted to the area to be irrigated.

This operation, however, requires to be very carefully carried out, and necessitates very close personal inquiry by officers of experience into the requirements of the tract of country affected, in order to ensure that justice is done to the cultivators.

Raising the water-rate would have no effect on the lavish use of water, because, under the present rules, when a cultivator has taken his second watering, he may take as many more as he likes, or can get, without paying anything additional. The only effect of raising the water-rate would thus be to curtail the *area* irrigated; but it would in no way restrict the supply to individual fields.

Another method of remedying the evil complained of would be to charge for each watering; but this plan would not only entail an enormous increase of establishment, but would of necessity put far too much power into the hands of poorly-paid native subordinates, and would, moreover, largely increase the interference with the people, a step which is to be avoided as far as possible.

It is believed, after mature consideration, that the method first indicated, viz., the restriction of the size of the openings, is the only practical method of at present meeting the necessities of the case; and that it would, if properly carried out, effect the desired object.

It is not possible to say *exactly* to what extent the raising of the water-rate would affect the poorer crops; but it may be conceded at once, that the higher the rate the smaller the margin of profit to the cultivator; and hence the fewer poor crops would be grown. It is believed that any very considerable rise in the rate would confine irrigation to those crops, which require high cultivation, and that the crops, which to a great extent form the food staples of the mass of the population, would thus be left entirely to the mercy of the seasons.

At present water cannot be charged for by quantity, as hitherto it has been found impossible to measure the volume of small bodies of water with sufficient exactness. Many ingenious modules have been at different times invented, but, without exception, they have all failed in practice; they have either become clogged

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with silt, or have failed to work from want of sufficient head, or from inability to deliver, even approximately, a steady supply with varying heads on the outlet.

It is also to be noted that almost all the forms which have been hitherto suggested have been far too expensive to admit of their introduction into general use.

Again, it would seem that, even if a satisfactory module were invented, it would not be possible to fix one general rate for the sale of water for irrigation purposes, as the effect of water, and, consequently, its value in maturing a crop, varies with local circumstances both of soil and climate. Special rates would have to be fixed for different tracts, and, perhaps even, in some cases, for individual villages. It may, therefore, be concluded that such a system would be found in practice too cumbrous and complicated to admit of its introduction.

The contract system of payment for water does not at present exist on any canal in the Punjab. It has, however, been tried more than once and on different canals, but has each time been abandoned for reasons which will be subsequently detailed.

From 1827 to 1833 a system of short-term (seldom beyond three years) contracts obtained on the Western Jumna Canal, but Sir William Baker states that it was found that, although the cultivators used and paid for the water in a year of drought, they refused to pay water-rent when the season happened to be favourable; the canal authorities of course claimed the water-rent under the terms of the contract, and in this way the outstanding arrears became very considerable. He also states that it was found very difficult to ascertain the irrigating capabilities of an outlet, owing to the supply in the canal increasing year by year as improvements were made.

About the year 1841, the experiment was again tried on the same canal; the contracts being fixed for 20 years on very favourable terms to the cultivators. When these contracts expired about 1861, it was found, on measurements of the area irrigated, that Government was a very heavy loser. Thus it is said that in one village whose contract had been made on the supposition that 800 acres would be the average area irrigated, it was found that over 3,000 acres had actually received water, and as the cultivators refused to take a fresh contract except on equally favourable terms it was found impossible to continue the system.

Similarly an attempt was made in 1856, by order of the Chief Commissioner of the Punjab, to introduce the contract system on the Husli Canal.

After endeavouring for two years to induce the zamíndárs to accept a system of contract, the Director of Canals (the late Colonel Dyas), reported to Government as follows:—

"It will be seen that out of 440 villages, representing an annual payment (average of seven years, 1849–50 to 1855–56 inclusive) of company's Rs. 72,000, nine villages only, representing an annual payment of company's Rs. 4,294, have come forward. They offer to pay company's Rs. 3,584 only in the aggregate, or company's Rs. 710 less than the average, on the condition that the water-courses are never to be closed, or, in other words, that there is to be no 'Bundee' as far as they are concerned."

It is needless to say that a proposition of this kind could not be entertained, and the project consequently was abandoned.

On the question being again raised, in 1872, Colonel Crofton, then Chief Engineer for Irrigation, reported that in his opinion matters were not as yet ripe for a repetition of the experiment.

It is true that the fixed supply which is a necessity for the delivery of water by volumetric measurement is not required in the case of lump-sum contracts, where the contractor takes the risk, and so far the latter system is simpler; but as a contract to be of any use must include a series of years, and as experience shows that the village communities are not sufficiently educated to see the necessity for taking the bad years with the good, any contract based on fair terms appears to be at present an impossibility, although all canal officers hope that the introduction of the system may become practicable at some future date.

It seems worth while to note here that one of the greatest advantages usually claimed for the contract system is, that it would do away with the necessity for the half-yearly measurements. This view, however, is not altogether correct, and has frequently been combated in various official papers.

The following is an extract from para. 6 of Government of India Resolution, No. 28 I., dated 24th February 1868:—

"To ascertain the actual areas irrigated is, in fact, almost as necessary for a system of contract as for a system of direct charge on area, and, under all circumstances, the knowledge of the areas is required for statistical purposes."

It may also be mentioned that the views here expressed were in entire accordance with those of the late Sir Donald McLeod (then Lieutenant-Governor of the Punjab) as given in his secretary's letter remarking on the above resolution.

The following extract from Colonel Crofton's No. 60, dated 2nd September 1872, is also given as bearing on this subject:—

"8. With reference to the value of the periodical measurements, even under a system of contract payments, in distributing the charges among the several irrigators, the following statement, which I have extracted verbatim, is given in the Revenue Report of the Eastern Jumna Canal, North-Western Provinces, for 1870–71, of a partial failure of the contract system.

"'The diminution in the average number of contract outlets, from $407\frac{1}{8}$ in 1869–70 to $83\frac{1}{4}$ in the present year, requires a few words of explanation. As far as I have been able to ascertain, the distribution of the profits among themselves was found by the zamíndárs of large villages a more difficult task than they were equal to; quarrels arose, and numerous petitions were submitted to the canal officer, to the effect that the more influential men were swallowing up the profits of the contract, whilst the weaker individuals could not get their fair share. These matters, coming under Act IX. of 1859, could not be settled by the canal authorities; so in many cases they were taken into the civil courts, where law expenses further reduced their profits. Thus it happened that, when the contracts of many villages expired in 1870, those with a large number of shareholders and a large area of irrigation did not apply for a renewal.'

"Some years ago, in 1866 if I recollect rightly, when the question of measuring up the irrigation in the Dera Gházi Khan district arose, the chiefs and other influential men objected; but a large body of their tenants, who were present in camp, begged me to take their interests also into consideration, and have measurements made, assigning as their reason that they would thus have some check on the exactions of their landlords."

From what has been written above it will be gathered that any extensive introduction of a contract system is surrounded by difficulties, the chief one undoubtedly being the unwillingness of the cultivators to enter into any but a very one-sided bargain, under the terms of which they *must* gain, and Government *must* lose. It is, of course, possible that when the river works are perfected at the heads of the permanent canals so as to ensure fixed supplies for the different seasons of the year, a system with this object may be introduced in some shape or other, and that it may come soon into operation is the ardent hope of every thoughtful canal officer, but, as it was remarked by Colonel Crofton in 1872, so it may still be said, that the canals are not yet ripe for the system.

The complaints which have been made during former trials, that the richer and more influential landowners have benefited at the expense of their poorer and weaker neighbours, can, it would seem, only be guarded against by a retention of the present system of constant supervision, which includes the patrolling and subsequent measurement of the area irrigated, in order to ascertain with the greatest exactness the incidence of the charges for water; and it may be noted that, even at the present time, one of the greatest difficulties a canal officer has to contend with is the equal distribution of the water to rich and poor alike, especially when the supply falls short of the demand.

In short, it may be said that the experience gained under the system at present in force, in which the water is practically not so much restricted as it probably would be under a contract system, leads to the conviction that equitable distribution of the water can only be obtained by the constant supervision of the canal officer, as above described; unless, indeed, the villagers would agree to entrust these duties to some of their own number or to some independent and qualified person. Their distrust of one another is, however, so great that there seems to be but small probability of their accepting willingly such a change, for some time to come at any rate.

It must also be remembered that it is precisely the minute supervision of the area irrigated which entails the entertainment of a large establishment whose duties are for the most part confined to thus watching and measuring the fields irrigated; and if this establishment must be retained under any system of contract, such system would at once be deprived to a great extent of the advantages which are usually supposed to attend upon its introduction.

As regards the question of making the contract system compulsory, it may be said that it does not, at present at any rate, appear desirable to force such a system on the people in opposition to their wishes, and that it is considered that it should be introduced only with the full consent of the cultivating community; the remedy for the lavish use of water must be looked for in the meantime in the manner previously indicated, *viz.*, in the restriction of the size of the outlets and the consequent diminution of the supply of water available for irrigation in each village.

Major E. C. Corbyn.—The canal dues in this district are not recovered under any law, merely under the authority of the Financial Commissioner's No. $\frac{8}{2894}$, of 18th May 1876. It is realised in this way: after ascertaining the extent of land irrigated, the amount to be realised on it is intimated, through the patwári, to the proprietor, and is paid in by him in the same manner as the Government demand on his land. No difficulty has been experienced in realising the water-rate in this manner, and no better principle can be suggested. It is not found that water is used in too lavish a manner by agriculturists in this district on account of the charge being made on the irrigated area, as the value of water is thoroughly appreciated in a district like this, liable to prolonged drought; and the water is supplied in turn, according to a roster which is carefully kept up, so that as soon as one proprietor's land is fully irrigated his neighbour is on the look-out for his share, and he is quite as vigilant as the Government officials to prevent any waste of water. It will be seen from this that it would be impolitic to raise or interfere in any way with the present water-rate. I am very adverse to realising water-rates on crops, as it has a very demoralising effect on the proprietor, and often leads to fraud, and sometimes to loss by the proprietor as well as to Government. I would, in regard to inundation canals, advise adhesion to a fixed water-rate as the most equitable system of realising a water due, and most satisfactory to all concerned. I entirely deprecate the system of water being charged for by quantity, as it arms unscrupulous and underpaid officials with a terrible arm for oppression, and opens door for fraud and peculation. I have no experience as regards a contract rate, and must, therefore, be silent; but I should say, in a district like this, it would not answer.

Mr. O'Brien.—Canal dues consist of (1) labour assessed on the irrigators; (2) fines on absentees from the works; (3) cash payments to establishments. The labourers turn out at the summons of the deputy Commissioner.

The fines and payments for establishment are collected in the same way as the land revenue. No law exists for either calling out the labour or levying the fines. The practice is a bequest from former Governments. The system is bad, because it rests on no legal basis. The irrigators might refuse at any time to supply labour, or to do a work which the deputy Commissioner thought necessary, and the whole would break down hopelessly. The pressure necessary to make the irrigators supply the amount of labour necessary often takes very objectionable forms.

I should like to see the whole matter placed on some legal foundation, the forced-labour system abolished, and canal rates paid in cash. Cash payments would be unpopular only because the present system is so old, and because the change would be an innovation; still it could be done gradually. The agriculturists are very lavish of the canal water, and there have been many complaints of their injuring roads by allowing water to escape from their fields so as to impede traffic.

Mr. Tremlett.—Hitherto the Muzaffargarh system has been, that each canal had a list of contributaries, whose lands are entitled to be irrigated by it. There is a small panchyát of managing members, who, under the supervision and final orders of the revenue authorities, fix the number of day labourers who would be needed to clear the canal. These labourers are divided among the contributaries in proportion to the land revenue they pay. If they furnish this quota of day labourers well and good; but for the number not supplied a fixed sum per labourer is charged, and credited to a special canal fund, out of which hired labour is paid and improvements are effected. Casual works and improvements during the season are effected in the same way. These payments for non-supply of statute labour are recovered by the tahsíldárs like land revenue, and, so far as I remember, without any coercive measures beyond occasional sales of chattels; in cases of real poverty, postponements or even partial or total remissions being readily granted. It is, however, now the fashion to discredit this system of statute labour, which doubtless has defects; and I believe it is in immediate contemplation to abolish it, and substitute for it another, which I hope will make up in other ways for its greater costliness.

Mr. Roe.—The owner's or water-advantage rate is a fixed charge, and is collected as a part of the ordinary land revenue. The occupier's or water rate is paid in kind by "cher" labour; chers failing to attend have to pay 8 annas a day as commutation or fine. A list of absentees is sent by the canal officer to the deputy Commissioner, who collects the money as an arrear of revenue. One or two improvements in detail have been suggested at the present settlement, but there is no difficulty in working the system generally, nor is there any difficulty in the system of village assessments. Disputes about the right to take water are very rare. Those which do occur are settled by the canal officer under section 68 of the Canal Act (VIII. of 1873). I have not known any instance of a suit being afterwards brought in the civil court to set aside this decision. It would be absolutely impossible to charge for water by quantity.

I. IV. Qn. 14.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—Canal dues are recovered in North-Western Provinces and Punjab under Act VIII. of 1873; the assessments are made by the canal officers, and realisations effected by revenue officers, subject to appeal under certain conditions. I have never known of any difficulty in applying the law, and I am strongly in favour of the existing system.

I admit most readily that water is very frequently used in too lavish a manner by cultivators under the present system of assessments on irrigated areas, but think that incorrect and exaggerated ideas prevail regarding the amount of canal water actually given to the crops, loss by percolation in main and distributing channels being by most people set down as wasted in the field. The best remedy against wasteful irrigation would, of course, be to charge by volume consumed; but the practical difficulties in the way of working a water meter in ordinary canals of irrigation (want of "head" and clogging by silt) have not as yet been successfully overcome. Irrigation by lift is always economical, so far as amount of water given to the crop is concerned; but it would lay a very heavy burthen on the cultivating community and check extension of cultivation most seriously if a canal were designed so as to afford only "lift" irrigation; and the loss by absorption in a long trench, at the further end of which a couple of men may, perhaps, be ladling out a mere dribble of water, is very great in light soil. In some cases, where the size of the outlet at the water-course head has not been fixed in the first instance with sufficient consideration, economy of consumption would result from reducing its area. But it would be a mistake to suppose, as some do, that mere reduction in size of outlet would, in every case, produce economy of consumption, *except by actual reduction of area irrigated.* There are few more wasteful methods of irrigation than by "wire-drawing" a tiny streamlet of water over large areas of land (see remarks on this subject in answer to question 27). The argument in favour of such a measure from great economy of well irrigation would only be sound and valid in cases where canal irrigation lay as close to the distributary as well irrigation lies round a well; and if we were to multiply our distributaries so as to bring all irrigation within a distance equal to the radius of economical irrigation from a well, the cost of maintenance would be prohibitive. Raising the water-rate will restrict irrigation to superior crops and soils; but so long as system of assessment on irrigated areas is maintained will not check wasteful irrigation *when the water is taken.* Taking the Indian climate, as we find it established by nature, and our system of canal irrigation as we find it limited by physical and economical considerations, I think that, where it is not practicable to charge by volume of water supplied, economy of consumption will be much more powerfully induced by very strict limitation of the *time* during which the water is supplied than by reduction of volume or by raising the water-rate. What we want to bring about is watchfulness and carefulness on the part of the cultivators; and a man is much more likely to look carefully after the distribution to his fields of a good strong stream of water for a short time than after that of a feeble rill which may take a whole day or more to cover his field, if it ever gets there at all. In the case of canal flow irrigation the anxiety to save labour in lifting does not operate as a check on waste, as it does in the case of a well. The extent to which high water rates will throw poorer crops and soils out of influence of canal irrigation must depend entirely on amount to which water-rates are raised and on prices current. There is one effect of high rates, both on the canal revenue and amount of food produced, which I may point out. Water is, especially during the "rabi," often given to improve the yield of a crop. The cold weather rain may have been scanty or ill-timed, and a watering from a canal would increase the yield per acre to the value of Rs. 3, say; with "rabi" water-rates at Rs. 2, the watering will be freely given, with rates at Rs. 3 or 4, it will not be given, and the difference to the cultivators and the State, when thousands of acres are involved, will be very considerable. This is no hypothetical effect of high rates; even with existing rates our irrigation is constantly checked in years of fair rain and low prices by considerations such as those set forth above.

I know of no instance in which water for irrigation is charged for by volume. On the Eastern Jumna Canal water is supplied for irrigation to a small extent on contract. The system has the advantage of enabling Government to dispense with annual measurements of areas irrigated for purposes of assessment. Measurements would still be needed for statistical purposes. The contract system would never induce economy of consumption in same measure as issuing water by volume. In the latter case the ill effects of waste are directly brought home to a cultivator by an increased demand; in the former a fixed sum is paid annually, and economy should be effected by making the allotted share of water cover more ground. But the "more ground" is most probably not to be found, or belongs to other people than the contractors. My experience of contracts was that the contractors would only strike a bargain on terms *most* favourable to themselves, and then considered themselves in duty bound to use as much water as they possibly could. I never received any complaints about distribution amongst cultivators of a contracting village, the people making their own arrangements, to their own satisfaction apparently.. A system of compulsory contract would, in all cases, greatly simplify assessment and collection of canal revenue, and, where the demand for water is in excess of supply, would induce economy of consumption also. But it would not, I fear, be nearly so popular with the villagers as the present system, unless the contract rates were pitched so low as to entail a considerable loss on Government. At present the cultivator pays according to the demand of the season, and the Government strikes the average, balancing losses of one year against the gains of another. But in a contract system the cultivator would have to strike the average, which he is eminently unfitted to do. He would fling away the gains of a good year and howl for remissions in a bad one, or else get deep into his bunniah's books. Under a contract system, too, where demand is in excess of supply, the savings in cost of measurement would be fully counterbalanced, if not exceeded, by the necessity for increased outlay on improved means of regulation and establishment for control of water supply. At present we keep our expenses as low as possible, and do the best we can for the money laid out, but the universal adoption of contracts on a canal, especially if the rates were maintained at an average fair to Government, would entail greatly increased responsibilities in distribution.

Board of Revenue.—The canal dues are recovered in these provinces under the North-Western Provinces Canal and Drainage Act (VIII. of 1873). The mode in which they are collected is well described by Mr. Staden, Collector of Saháranpur: "The khasra, or " register of measurement, is the basis of demand and " of statistical returns. This khasra is prepared by " a canal amín under the supervision of a zilidar. " On completion of measurement of a village, the amín " prepares a register of assessment (khatiauni) in " which all the entries concerning each cultivator are " brought together and totalled. These khatiaunis, " after being checked by canal officers, are sent to the " collector, by whom collections are made, through " lumbardars, and they receive an allowance of 3 per " cent. on sums paid within eight weeks from date of " receipt of the khatiaunis. Any subsequent altera-" tions in the demand is communicated by the canal

NORTH-WESTERN PROVINCES.

" officer to the collector. What generally happens, " practically, is that the patwari makes the collections " and keeps accounts of such privately, the lumbardar " being either too illiterate or lazy to give himself the " trouble. No regular form of *wasilbaki* account " for collection of canal rents has ever as yet been " prescribed. Each collector has probably some " different form of his own, and this is an omission " which I have noticed in my reply to the circular " inviting criticism on the patwari rules."

Mr. Anderson.—Water is not charged for by quantity, nor can it be attempted until the full duty per cubic foot of water is known, and this will not be for years to come yet.

(9.) A contract system was tried on the Eastern Jumna Canal, and at one time 40 per cent. of the water-rates were so assessed; but there were so many difficulties in the satisfactory settlement of rates, distribution of water, amongst the people themselves, that the system has all but been abandoned. For particulars see revenue reports from 1859 to 1876.

(10.) As the people requiring water object to it, the system may be said to be not a good one.

(12.) The cultivators were allowed to settle the question of the distribution of the water.

(13.) Complaints have arisen; doubt whether they could be guarded against.

BENGAL.

BENGAL.

Colonel Haig.—We have had a special Irrigation Act since 1873. On the whole, it has worked well. No difficulty has been found in its application. It has greatly checked illicit irrigation in Orissa. Canal (irrigation) dues are treated under the Act as the same as land revenue, and are recoverable by the same summary process.

The only effectual way of checking the wasteful use of water appears to be to sell it under such rules, and at such rates, as to offer a strong inducement to the regular irrigation of the whole area in each village, for which the canals furnish a sufficient supply if economically distributed. Serious waste is not possible under this system. We hope that the five-year and three-year leases, which render obligatory the irrigation of the whole, or of a fixed proportion, of the irrigable area, will work satisfactorily in this direction. In the case of leases of this description, the total assessment of the village becomes a lump sum, which is payable every year during the continuance of the lease, so long as the water-supply is sufficient. But the test of the sufficiency of supply is not the discharge through an outlet, but the crop raised. If the lessees can show a bad crop, and can prove that it is due to deficient supply, they will be entitled to remission of rate, either in whole or in part.

As to compulsory contracts and compulsory rating in any shape, so far as our experience now goes, it is not likely to be so remunerative as a voluntary system based on moderate rates and gross irrigable areas (as in the case of our five-year rice leases). It is pretty certain that we actually raised a higher revenue last year under a voluntary system, with Rs. 1–8 rates, than we should have done under a compulsory, with a one-rupee rate, which is the highest that could have been imposed. The manner in which the five-year and three-year leases are now being taken up seems to confirm the above conclusion.

BOMBAY.

BOMBAY.

Mr. Hughes.—Water-rates on irrigated land under our new works in Guzerat and the Deccan are recovered by the collectors in the same way and at the same time as the instalments of land revenue. Power is reserved to the Governor in Council by section 29 of Act I. of 1865 to assess on account of water from works constructed by Government, and Government consider that this fully provides for the levy of water-rates under Act I. of 1865 and Regulation XVII. of 1827.

No difficulty has been found in recovering dues for water-rates except in the case of inamdars, to whom the powers above referred to do not apply. A case in point is described in para. 478, Part I. of the Revenue Report.

Special legislation to meet this case is requisite. In the meanwhile orders have been given that inamdars are not to be allowed water except under an agreement to pay the amount that is chargeable for the same.

We have no experience to show that water is used in too lavish a manner when the charge is on the area irrigated, irrespective of the quantity supplied. As a rule the supply, except for perennial irrigation, is at present so large in proportion to the demand that the question has not arisen.

The system at present practised in Guzerat and the Deccan on our new works, it will be understood, is that of charging certain fixed rates on the area actually irrigated each season, which is ascertained by measurements or by inspection of the survey numbers where they have been subdivided for the purpose (vide paras. 281 and 282 of the accompanying Revenue Report). This system, apart from the additional trouble it involves, would appear to be in every way the most suitable, at any rate at first, where irrigation is not understood and the people are very unenterprising and unintelligent.

An alternative advocated by Colonel Fife, whose opinion is entitled to the greatest respect, is the distribution of the available supply in proportion to the area irrigated or the demand by each village. Taking a canal in Khandesh, which has been in operation for some years, for example, he proposed that it should first be determined how much water is ultimately to be passed off into each village channel throughout the whole length of the canal, making due allowance for any new channel which may hereafter be necessary. The people of any village to which it was intended to sell the water were then to be told the quantity of water to be passed into their channel, arrived at as above, and that with good management it would suffice for certain areas of perennial, rabi, and rice, and other monsoon irrigation. An agreement was then to be taken from them to pay a fixed sum for the year for it, and the canal establishment were to take care that it was passed from the canal into the channel. The distribution of the water after it leaves the canal was to be arranged for by the people themselves. Each village channel would in fact become like one of the ordinary pâts or watercourses led from the rivers, which are so common in Khandesh.

Colonel Fife admitted that to attempt to introduce he sale of water to all the villages at once would probably result in failure, and to be successful the plan must be thoroughly understood by all, and some at least of the villages are very backward. He suggested, however, that the plan should be tried experimentally with one of the best villages as a beginning.

As regards the measurement of the water, it should be explained that the village channels on the canal in question are each furnished with a masonry head sluice or regulator, which is designed to admit of a measurement of the discharge being made. It consists simply of a sluice, opening from the canal into a masonry channel or race 100 feet long, of uniform section. The discharge can be regulated by raising or lowering the sluice, and the quantity can be gauged by multiplying the velocity along the masonry race by the sectional area.

In accordance with Colonel Fife's suggestion, the proposal was explained to the people on the Jamda Canal, and after some delay one village came forward and offered to take water for 40 acres, paying at the rate of Rs. 6 per acre, on the supposition that not more than one-fourth, viz., 10 acres, should be sugar-cane. This offer was accepted. The conditions of the agreements executed were, on the part of Government, that they would supply the requisite quantity of water; on the part of the people, that they would pay the fixed rate on the area named in two instalments, and that if by economy they were enabled to irrigate, with the quantity of water allowed to them, a larger area of kharif or rabi (excepting only sugar) they were at liberty to do so without extra payment. They also agreed to keep the channel clear. The agreement was for one year. This was in 1876–77. The result of the experiment was so far satisfactory that the same village applied for water on the same terms for an area of 65 acres in 1877–78, or an increase of 25 acres, but none of the other villages are at present willing to adopt the system and they do not appear to understand it yet.

This system relieves this department of the necessity of annual measurements and of all minor distribution, and would considerably reduce the expense of maintenance. It also seems to me that if the people *could* be brought to properly understand the system, it would become extremely popular. I believe that one cause that deters people from irrigating the poorer crops is the fear that at the next revision of the settlement the lands for which they have taken water will be permanently assessed as bagayet rates. The measurement of the areas, and the careful record kept of the survey numbers irrigated, doubtless tend to confirm these fears, whereas the system of selling the water at the canal bank must, it seems to me, tend to reassure them on this point; also the arrangement is more or less of the nature of a bargain, and leaves to the people the chance, at least, of a margin of profit in which the sirkar does not claim a share. This, too, it seems to me, must commend the system to the people.

As long as the system is practised in only one village and the supply of water in the canal is greatly in excess of the demand, there are of course no difficulties attending it, but if it extends considerably, there will be difficulties in regulating the discharges during different seasons under varying heads. During the monsoon there can scarcely ever be any difficulties, owing to the abundant supply in all the canals fed from rivers with ghat catchments. From the conclusion of one monsoon to the beginning of the next the supply gradually diminishes, and it would be necessary to lay down the average discharge for each channel for each month. This, too, would vary each season, and it would be long before people were able to arrive at an average on which they would frame their estimate of the value of the supply.

MADRAS.

Mr. Thomas.—Wastage of water.—In connection with irrigation, the wastage of water under our present system of charging for its supply is a subject the importance of which can hardly be exaggerated. Economy of water is, in effect, the increase of the area cultivable by irrigation. I believe that economy alone might be made to increase the irrigated area from 50 to 100 per cent. There is no economy so effective as self-interested economy. To obtain this, I would sell the water by the cubic yard, and not by the acres irrigated. On this point I will again quote from one of my previous letters when collector of South Canara, 24th November 1869, No. 1507:—

"There is also another point on which I would venture to make a suggestion. The water-rates proposed are in no way proportioned to the amount of water used, but to the acreage to which it is supplied; consequently, a ryot that has once paid his Rupees 4 or Rupees 3 an acre for water has no inducement whatever to be economical in his use of water, but simply to get as much as ever he can for his money, and consequently to waste it, for his crop is the better for standing in running rather than stagnant water; and as he has no advantage whatever from using less water, he perforce always grows the most profitable crop, viz., paddy, whereas, if he could have a less quantity of water at a less total though equally proportioned cost for the same acreage, he would often grow raggi, cholum, Indian corn, vegetables, or other things, by which the land also would have the advantage it now, necessarily, never has, of a rotation of crops; and this he would be particularly disposed to do whenever, from a shortness of supply in the tank, there might be some uncertainty as to its being sufficient to carry the later-sown paddy quite to maturity, and his economy of water in this respect would tend to the security of the other crops as well as his own advantage, for the dry grain crops raised with the aid of just a little irrigation are particularly fine ones.

"It seems to me unfair when the supply is precarious to divide the risks, as it were, by charging the ryot Rupees 3, instead of Rupees 4. Our irrigation arrangements are strictly a contract, under which the Government undertakes to supply the water necessary for a crop, and the ryot in return pays the value of it, and has no option of refusing to pay, for if the water in the tank is sufficient he gets no remission, for neglect to cultivate is presumed, and only in the case of the Government supply failing is he entitled to remission, the principle being that, if the Government failed to fulfil its part of the contract, it cannot exact the other part from the ryot.

"Furthermore, if less water than is necessary for a crop of rice is supplied for Rupees 3, it is a mockery; if more than is sufficient is supplied for Rupees 4, it is wasted; and if every man that pays Rupees 4 wastes one-fourth of his water, how great must be the total waste. That, in practice, it really is so, every revenue officer will, I think, agree with me how much more advantageous it would be to economise that waste for other fields."

Lieut.-Colonel Mullins.—Law for recovery of canal dues.—Lavish use of water, &c.—The land assessment and the water-rates also are levied by the revenue officers, and the canal officers have nothing to do with the matter.

Canal officers are able to secure reasonable economy of water under the canals of the modern systems of irrigation. There is much and sometimes enormous waste in the case of old river channels, and the Calingaroyen channel in Coimbatore may be cited as an instance. There the ryots do pretty much what they please, and the supply of water actually admitted to the channel would suffice for the irrigation of three times the area now irrigated, were reasonable economy enforced. As a consequence of the waste, which is gross and palpable, the lands under the lower part of the channel are very badly supplied. Public-works officers have so far been able to effect little or no improvement, because—

(1.) The channel is under the control of the revenue officers, and no control is enforced; and

(2.) The ryots have as many openings, often without sluices or proper means of regulation, in the channel bank, as suits their convenience.

Water has never been charged for by quantity or volume for the irrigation of land. It could not be so charged for without a radical change of system, because—

(1st.) Ryots do not know what quantities are required for different kinds of crops;

(2nd.) The same crops require materially different quantities when the soils vary.

It would be a difficult matter to teach the former, and the means of deciding the latter are not at present available. No ryot, and, indeed, none but canal officers, have any idea what a cubic foot a second, or any other volume, means. It may be assumed that 200,000 cubic feet of water are, on the average, ample for an acre of rice; and if 4 Rupees be the water-rate per acre, it would follow that 50,000 cubic feet a rupee would be the ordinary charge by volume. Were it practicable to introduce the system at old works, it would undoubtedly pay to do so, as there the wastage is great. It would not answer to introduce it at the Godavari, for there a considerably less quantity suffices, and year by year, as the distribution arrangements have been improved, waste has been reduced, and the duty of a cubic foot a second increased.

It would not do to make a system of supply by volume compulsory as regards existing irrigation, for the introduction of any system which the ryots could not possibly understand would occasion well-founded dissatisfaction. It might be introduced at new canals or new reservoirs, but only by selling to capitalists or men of education and practical agricultural experience combined, who would be willing to take large quantities on highly favourable terms, and to see to the detailed distribution. Where canal officers have reasonable powers of control, waste can be prevented without injury to individuals. Consequently, the easiest remedy for waste is to give such control to them where, as in the case of old works, it is not now present. There then would be no advantage in resorting to another system, which would inevitably be very unpopular unless middlemen were introduced, and then unprofitable.

Major Montgomerie.—The assessment and collection of revenue from all irrigation works throughout the Madras Presidency is carried out by the Revenue Department, without any reference to the Public Works Department, except in the Kistna and Godavari districts, where it is understood that the necessity for remissions is sometimes referred to the canal officers for their report.

Water is certainly used in a most lavish manner, especially in the older irrigation works. To sell water according to the quantity taken would, no doubt, prevent this waste; but to do so would be very expensive and distasteful to the people, as interfering with what they have long considered their rights, and quite impracticable without an entire change in the canal administration at present existing.

Supply by volume is, no doubt, suitable when a limited quantity of water is required for the irrigation of what are commonly known in Madras as dry crops; but it must be remembered that rice or paddy is the principal crop irrigated in Madras, and that as long as water is available no other crop is likely to be grown on the paddy fields. The quantity of water required to mature a crop of rice is very considerable, and is estimated at from two cubic yards per hour per acre, where large areas are irrigated, to as much as eight or 10 cubic yards per hour per acre. Where only small areas are supplied, large orifices are consequently required to pass sufficient water for rice cultivation, and the prevention of waste becomes all the more difficult.

Mr. Foster.—Canal dues are recovered in the same way as arrears of revenue under Madras Act VII. of 1865. There has been found no difficulty in applying this law.

It is true that water is used in too lavish a manner when the charge is made on the irrigated area, or otherwise than by the quantity supplied. Raising the water-rate would not have the effect of preventing this; nor is it easy to say what remedy could be applied. It might be possible to make a reduction in the rate for people that applied for water every other day instead of every day, and by that means induce economy; but such a plan would be difficult while the notions of honesty of the people employed in distributing the water remain as they are at present.

I do not think that raising the water-rate would have much effect in throwing the poorer crops out of irrigation, and in confining irrigation to the more paying crops; for the people have already had time to find out which lands are best suited for each kind of crop and the rate of water-tax would not affect this. Irrigation itself *has* had the effect of throwing the poorer crops out of cultivation; but the result is, in the delta, to make the people live on the better crops, and to be able to procure them.

Water is never charged for by quantity; it would be impossible to do it in ryotwari lands, but I do not think it would be difficult to do in the case of whole villages or blocks of villages, for which the proprietors pay the water-rate. In these cases, I think it would be possible to measure the water entering the village, and then leave it to the proprietor to distribute.

In one zemindari of this district the proprietors pay a lump sum for the water supplied to them. I cannot say that I think the system is, on the whole, a good one. I am of opinion that the estate gets an unreasonably larger quantity of water than it pays for. If the system were to be that the zemindars should compound for the whole water entering their lands through a particular aperture, I think the system would be good. The present system, by which the amount of composition is fixed by the area that we know to have been cultivated in former years, I do not think very advantageous to Government. We have no accounts to show what is the extent of land cultivated in zemindaris, and we cannot fix the amount of composition properly in this manner unless we have trustworthy accounts showing former cultivation. Where the contract system is adopted, the proprietors themselves arrange for the distribution of the water. I think that a scheme might be introduced for making compulsory the system of contract in the case of large blocks of land where the water can be measured where it passes through a given aperture.

QUESTION 15.—WATER-RATE IN RELATION TO CULTIVATOR'S MARGIN OF PROFIT.

CH. IV. QN. 15.

Having reference to the margin of profit on irrigated crops commonly left to a cultivator after payment of the existing water-rates, could these rates be increased without trenching unduly on that margin of profit? How would raising the water-rates operate on a cultivator under a lease, and how on the revenue-paying proprietor if it took place during the currency of the lease or settlement respectively?

PUNJAB.

PUNJAB.

Captain Ottley.—It is believed that, taken as a whole, the rates at present in force could not be raised to any great extent.

Attention has been directed to this subject in this Department, and it is probable that some minor changes will be made; but considering the effect which a change of rates always has in unsettling the minds of the cultivators, and with special regard to the unfavourable seasons which have recently been experienced, it has been deemed desirable to postpone this question until matters are more settled, the more so as it is believed that such changes as are in contemplation will not appreciably affect the revenue of the canals.

Mr. O'Brien.—The supply of water in the canals of this district has been, in consequence of the neglect of the canals, very precarious, and I do not think the contributions of labour or cash could safely be increased at present. The canal administration has been temporarily improved lately, but not permanently. If the improvements were permanent, and the people became able to trust in a regular supply, the contributions might easily be increased. At present canal irrigation is deservedly mistrusted. Canal dues are almost invariably paid by the tenants, and, if they were raised, I imagine the tenant would continue to pay them till they grew so heavy as to make him throw up his tenancy.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Board of Revenue.—Questions similar to those discussed in the Commission's, No. 15, (Irrigation Works,) were raised by the Government of India in their No. 725, dated 27th September 1877, with reference to the proposal of the North-Western Provinces Government to raise the water-rates for flow-irrigation on the Ganges and Eastern Jumna to the level of those imposed on flow-irrigation from the Agra and Lower Ganges Canals.

Special inquiry into the subject was made by the Board, under the orders of the North-Western Provinces. The officers of canal-irrigated districts were consulted, and full statistics regarding the rent-rates of land irrigated from canals (flow and lift) and wells were obtained from them. It was ascertained that water-rates had been raised, and the rise in the water-rate had not been followed by a change in rents. It was proved that the heavier or lighter incidence of the water-rate in no way affected the rent-rate by the fact that, notwithstanding the higher flow water-rate, the rent-rate of flow-irrigated land was generally identical with that of lift-irrigated lands; while, as often as otherwise, the rent-rate of lift-irrigated land, when the water-rate was lower, was higher than that of flow-irrigated land. It is notorious that well-irrigation is far more expensive than canal-irrigation, and yet, as a rule, the canal-irrigated lands are not more highly rented than those irrigated from wells. Where canal-irrigation is introduced for the first time, the rent of land hitherto dry is raised to the level of the rents ruling on lands which are irrigated from wells. No calculation is made of the cost of irrigation. The prevailing rate, *e.g.*, for unirrigated 1st-class dúmat, is Rs. 2-4-0 per bigha, and of the same soil irrigated from well or jhîl Rs. 4-0-0 per bigha. Canal-irrigation is introduced. The customary rent of irrigated dúmat, 1st class, being Rs. 4-0-0, the rent of the land hitherto dry and now irrigated from the canal will be raised up to the level of that of well-irrigated land, whether the irrigation from the canal be "flow" or "lift," the entire charge for the former, supposing wheat be the crop, being Rs. 2-4-0 and Rs. 1-8-0 per acre, and quite irrespective of the fact that well-irrigation is more costly than canal-irrigation.

There can be no doubt that existing water-rates could be raised without trenching unduly on the margin of profit annually left to the cultivator, provided that the enhanced water-rate plus the cost of distributing the water is not greater than the cost of well-irrigation, and the rent-rates on canal-irrigated and well-irrigated land are, as has been proved by careful inquiry over many canal-irrigated districts, to be identical. Of course the line must be drawn somewhere. The 1st-class flow-irrigation might be raised from Rs. 5 to Rs. 7, and in the case of some crops doubled, without trenching unduly on the cultivator's profits. That the existing water-rates may be enhanced without risk can hardly be doubted after a perusal of Mr. Wright's estimate of cost of production with—(1) well, (2) canal lift (one lift only), (3) canal flush, irrigation, and of amount and value of produce and of profits. The profits shown below for the crops, which are more generally watered for the Cawnpore district:—

Crops.	Profits when the Land is irrigated from								
	Wells.			Canal by one Lift.			Canal flush.		
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.
Indigo - - -	6	0	0	20	0	0	24	0	0
Maize - - -	9	14	0	16	0	0	17	12	0
Wheat - - -	16	7	0	28	4	6	31	2	6
Bijhra (barley, gram, and peas mixed) -	12	1	0	18	11	0	20	7	0
Poppy - - -	8	13	0	22	5	0	26	1	0
Sugarcane -	21	8	6	53	9	10	62	1	6

Mr. Webster considers that a small enhancement of the water-rates at present in force on the Ganges and Jumna Canals might fairly be made, and that, as far as his experience goes, the water is now sold to the cultivator at a rate so very much below that which well-water would cost him that he profits unduly from the irrigation supplied by the State.

Raising the water-rate during the currency of a lease would diminish the profits of the cultivator by the difference between the old and new water-rate, but whether it would unduly trench on the cultivator's profits depends on the profits he enjoys. If he is rack-rented and left too small a margin of profit he may be unable to pay an enhanced water-rate. In that case the landlord must either lose his tenant, whom he will not be able to replace, or abate his rent. Government is entitled to a fair price for its water (the cultivator in paying water-rate virtually buys the water). It is not right that the Government should be precluded from obtaining a fair price for canal water by raising the water-rate when that rate does not represent the fair price, by the fact of the landlord appropriating more than a fair share of the tenant's gross profits. As for the effect on the revenue-paying proprietor, enhancement of the water-rate during the currency of the settlement would affect him only where he was compelled to make an abatement in the event of the rent hitherto paid being so high that the tenant could not afford to pay the enhanced water-rate from the profits of his cultivation, or the enhancement was so great as to forbid cultivation with the aid of canal-irrigation being sufficiently profitable to be continued even where the rent demanded by him was only fair and equitable. As Mr. Webster puts it, "such an enhancement" (raising the water-rate), "whether it "fell upon the proprietor or upon the cultivator, "would only be reduction of the surplus over and "above a fair profit which one or the other has "hitherto enjoyed at the expense of the State."

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North-Western Provinces.

Colonel Brownlow.—The limit to which water-rates can be increased in any given locality depends entirely on nature of soil and climate, amount of population, cost of cultivation, and prices current. I think that for the present it would be very unwise to go beyond Agra Canal rates in the North-western Provinces.

BENGAL.

Bengal.

Colonel Haig.—Existing water-rates in Bengal could not be raised at present, nor probably for many years to come, unless there should be a considerable and permanent rise in the price of agricultural produce.

BOMBAY.

Bombay.

Mr. Propert.—The crop rates on the new canals and tanks have been purposely fixed at a low figure in order to induce irrigation. They could certainly be raised so as still to leave a fair margin of profit, but it is questionable whether it would be politic to introduce higher rates until the demand for water becomes more steady and certain. With regard to the Bombay Presidency, as the water-rates were imposed since the commencement of the 30 years' revenue-survey leases, and in addition to the ordinary land assessment, there would be no legal objection to raising them at the pleasure of Government in the case of those persons who demand water; but no compulsory water-rate could, I think, be imposed without legislation upon all lands capable of being watered by a tank or canal until the expiration of the survey leases. The same remarks apply to lands held by jahagirdars or proprietors. Of these, however, there are very few.

MADRAS.

Madras.

Mr. Sullivan.—(*a.*) This question, it is thought, *may safely be answered in the affirmative; for,* as shown above, the present water-rate of Rupees 4 is not in excess of that which it was thought equitable to impose when the consolidated wet assessment was settled early in the century, when agricultural profits were far below what they are at the present day. Taking the Kistna as a sample district, the profits per acre of land irrigated from an unfailing source are given below, the value of the crop being calculated on the average of the prices ruling from 1866-75 :—

Grain.	Produce per Acre.		Expenses per Acre.		Profit per Acre.
	Madras Measures.	Value.	Labour, &c.	Assessment, including Water Rate and Local Cess.	
Paddy -	753	Rs. 33	6·6	6·69	19·71

N.B.—The value of the straw is not taken into account, as this ought to return to the land in the shape of manure.

The only difficulty that presents itself in regard to raising the water-rate, where it is charged in addition to and separate from the land assessment, is that the districts where those conditions exist would, for some considerable time, be called upon to contribute more largely to the public revenues than those where a settlement of the consolidated wet assessment has been, or is in process of being, concluded for 30 years. Until the time comes round for a revision of this settlement no further demand can be made on the agriculturists holding under it.

(*b*). The cultivator would, of course, be bound by the conditions of the lease alone, and the raising of the water-rate by the Government would not affect him unless his landlord had inserted a clause in the lease to provide for the contingency. In the second case, as the water-rate is not dealt with by the Settlement Department, except where the assessment on irrigated lands is consolidated, the Government have the power to enhance it during the currency of the settlement, and the proprietor would have to pay it.

Lieut.-Colonel Mullins.—Increase of water-rates.—The advisability of increasing water-rates must be decided with reference to the actual circumstances of particular localities. In the delta of the Cauvery there are indications that the assessment, which is there consolidated, *i.e.*, there is no distinction between land revenue and water-rate, is remarkably low, taking the character of the water supply into account. The great increase in the value of land since the upper anicut (weir) was built upwards of 40 years ago is evidence of the great value of the private property created by that improvement, and this property has not contributed to the needs of the State. This delta, the most extensively irrigated, and, perhaps, richest, tract of country in the Presidency, remains unsurveyed; and data are wanting, therefore, for ascertaining the actual extent of irrigation or for dealing comprehensively with any questions relating to the revenue.

In districts which have been settled for a fixed period no alteration of rates can be made until the time for a fresh settlement arrives.

Major Montgomerie.—Judging from the selling value of irrigated lands in districts such as Tanjore and Tinnevelly, the margin of profit left to the cultivator must be very considerable; the best way of discovering how much the water-rates could be increased without trenching unduly on that profit would be to encourage public competition in taking up the lands on the expiration of leases; existing settlements cannot be interfered with.

Mr. Wilson.—The assessment of land in this Presidency is supposed to be the value of half its net produce.

In the deltas of the Kistna and the Godavari, where separate water-rates are imposed, it is impossible to say whether the sum of the land assessment and water-rate represents half the net produce or not, for the land assessment was calculated, not on what the land produces—white paddy, but on a dry grain standard, and the total charge on the land is this fictitious assessment, *plus* a water-rate. If the total demand on the land equals the value of half its net produce of paddy, the water-rates could not be raised without upsetting the principles of assessment prescribed by the Secretary of State for this Presidency.

The assessment of these delta lands rests on a basis so artificial and fictitious that it is impossible without

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minute inquiry to say whether the water-rate is fair or too low. For all present occupation it certainly is is not too high; if it were, the land would be relinquished. An increase in the water-rate during the currency of a lease would affect the tenant according to the terms of his lease. A revenue-paying proprietor would have to pay the new rates in full, because the rates are, under Madras Act VII. of 1865, fixed at such amounts as the Government may from time to time think proper to impose, and are never fixed for any given term; water-rates are altogether apart from revenue settlements.

Mr. Crole.—The existing water-rates are too high, as already brought by me to the notice of Government.

Mr. Foster.—I take the average profit to a ryotwary ryot to be Rupees 15 an acre after paying the Government assessment and water-rate, which would be about seven or eight rupees; that is to say, the actual profit, after deducting only the expenses of cultivation, would be about Rupees 22 or 23; the margin of profit usually supposed to go by right to the ryot is half of this; hence, by raising the water-rate we should not trench unduly on the ryot's profit, but the above figures I have given for ryotwary lands. I do not feel so sure that the ryots in zemindari lands could bear much extra water-rate.

If we raised the water-rates on land cultivated by a ryot under a lease from a zemindar, the zemindar himself would really have to pay the extra rate, but he would probably find even during the currency of the lease some means of making the cultivator share it with him, and it would be very unlikely that he would renew the leases except on terms which would amply repay him for anything extra he had paid.

Major Vibart.—The land and water rates together seem to be in ordinary times about one-sixth of the gross value of crop, but at the present time the price of rice is still so high (six measures per rupee) that the land and water rate is only about $\frac{1}{12}$th of the gross value of crop.

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QUESTION 16.—PREPARATION OF STATISTICS.

How are the statistics of irrigation recorded, and are revenue reports of the chief irrigation works prepared by the canal administration, and in what form? Do you think them necessary? To what extent do you think the record of such statistics valuable or necessary for the proper administration of irrigation works? To what degree of detail may the record usefully go, and how may the facts be best collected and recorded?

Punjab.

PUNJAB.

Captain Ottley.—The accounts of expenditure and income are recorded in detail in the examiner's office.

They are summarised at the close of the year and furnished to the local government in the forms in which they appear in the annual Revenue Report. They consist of a general statement of income with supplementary statements of detail, and capital and revenue accounts of each series of canals under the Irrigation Department.

The examiner also furnishes an appropriation and outlay account, which is printed with the annual Progress Report.

Revenue reports are prepared annually by the executive engineers of irrigation divisions; these are forwarded by them to their respective superintending engineers, who compile reports for their circles. These reports have hitherto been printed, and have formed part of the revenue report of the Province, but in future, under recent orders from the Government of India, they will not be printed *in extenso*. They are reviewed by the chief engineer, and are forwarded to the Government of India with a resolution of the local government. These various reports are prepared in forms which have been generally approved by the Government of India. A reference to the last report published will best show the forms in use.

Monthly statements of irrigation operations are compiled in the chief engineer's office, and published in the *local gazette;* these are approximate, and are obtained from the record books of the canal patrols, whose duty it is to enter the area irrigated in their respective beats from week to week. They give, however, a fair idea of the state of the irrigation in each crop.

Half-yearly statements for each crop, and an annual statement including both crops, are also compiled and published. These are prepared from actual measurements and assessments, and are accurate records of the irrigation year by year.

Further particulars of duty done by the water, area under chief crops, proportion of flow to lift irrigation, and other details, will also be found in the annual Revenue Reports.

These reports are of great value as a record, and enable a comparison to be made of the progress of irrigation year by year.

They show in great detail the rise and fall in the canal-supplying rivers of the Province, the water supplied to each canal, and the duty derived from it, and allow officers of one circle to judge of the work done by them in comparison with the work done in other circles; and as the reports are also circulated to other provinces and administrations, the experience gained in one province is thus made available over the whole of the country.

Mr. O'Brien.—No statistics of the canals are recorded, and no revenue reports are prepared, by the canal administration in this district. No patwári's annual papers, based on local inspection, have ever been made. The figures in these answers are taken from Settlement Survey, which was made in 1873–74 and 1874–75. I suppose there cannot be two opinions as to the advantage of recording statistics of canal irrigation.

This district has 3,97,529 acres of cultivation, of which 2,09,081 are irrigated by canals. The loss to every part of the revenue administration in having no statistics of canal irrigation, when more than half the cultivated area of a district depends on canal irrigation, cannot be exaggerated. The form and detail of such statistics can best be decided by those who have had experience of recording canal statistics; I can only depose to the injury caused by *not* having any statistics.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Colonel Brownlow.—Taking the revenue reports of the Irrigation Department of North-Western Provinces, which I know best, as a standard, I think that much might be done to reduce their bulk without appreciably impairing their usefulness. I would omit all reports of executive engineers, unless of very special importance and interest, many of the diagrams of river gauges, which are needlessly multiplied, and all copies of resolutions of Government or correspondence printed in the proceedings of Government, references to which could, if necessary, be given in the report.

Mr. C. C. Anderson.—(1). Irrigation statistics are recorded by members of the canal establishment.

Revenue reports are prepared yearly, and submitted by the local government to the Government of India.

(2). Most necessary, as they record in a concise form the operations of the year.

(3). The record of irrigation statistics is the basis of progress. Without a full knowledge of what has been done in former years it is impossible to know what should be done in years to come.

(4). The greater the detail the more likely the progress. The following should invariably be recorded:—

(*a*). Area, the unit of measurement being a field.
(*b*). Position of each field.
(*c*). Nature of crop.
(*d*). Nature of irrigation—flush or lift.
(*e*). Name of occupier.
(*f*). Name of owner.
(*g*). Source of irrigation.
(*h*). Nature of soil.
  The canal establishment is best fitted for recording irrigation statistics.
(*i*). Volume carried by each line of main water-course.
(*k*). Duty done by the volume at command.
(*l*). Season and nature of demand.
(*m*). Rainfall.

BOMBAY.

Bombay.

Mr. Hughes.—1. The statistics of irrigation are recorded in a most complete form by the officers in charge of the works. These comprise registers of the discharge of the rivers and canals fed from them, taken daily throughout the year by a carkoon and checked at least once a week by the subordinate and occasionally by the officer in charge; statements of the areas irrigated and the nature of crops ascertained by actual measurement by a measurer on the canal establishment, 10 per cent. of whose measurement is checked by the canal officer or the canal subordinate. A careful record of the rainfall on each canal is also kept. The accounts of the various works kept by the examiner and the returns rendered by the executive engineers and collectors under the canal rules give most complete details of the capital outlay, cost of maintenance, area irrigated, revenue assessed, remissions and realisations each year.

Revenue reports of the works are prepared annually by the canal officers, whose reports are embodied in a general report for the Presidency. A copy of that for 1876–77, Part I., relating to new works, is attached. (Accompaniment A.)

2. I think these reports are necessary, and that the statistics they contain are of great value in tracing the revenue progress of a work, the causes which deter or foster improvement, and in controlling the management. The comparison of results on different works too is most valuable to individual officers, who would otherwise have no means of obtaining information of the experience on other works which might be applied with benefit to works in their own division.

3. I cannot suggest any curtailment of the detail to which the report attached goes. In future reports it will be unnecessary to repeat the description of the completed works, but information in regard to the duty of the water per cubic foot of discharge on each work will be added where possible, and will be most useful for comparison of the degree of efficiency of the management on each work, and will also ultimately furnish data for use in estimating the return from projects proposed for execution.

BENGAL.

Bengal.

Colonel Haig.—As regards the manner in which our irrigation reports are prepared, the best answer to this question will be one of our annual revenue reports, copies of which are regularly furnished to the Government of India. Such a record of the statistics of irrigation is essential to good administration, and I think our reports give about the requisite amount of detail. They show for each project—

The capital account.
The interest account.
The revenue account.
The areas of each class of crop irrigated during the year, as compared with former years; the receipt from irrigation, navigation, and miscellaneous sources; the working expenses, and balance, whether profit or loss.

The working expenses, which consist of—
(1) Maintenance of works,
(2) Revenue management,
are exhibited in a good deal of detail, this being a branch of the administration which requires the most constant watching. Our reports give, I think, as complete a view as can be desired of the financial position and results of each scheme. The indirect results are perhaps not sufficiently noticed; in fact, they are hardly noticed at all, but they are difficult to estimate, and usually so out of proportion to the direct returns in the shape of revenue that they are liable to be looked upon with suspicion. From time to time, however, they may with advantage be recorded.

MADRAS.

Madras.

Lieut.-Colonel Mullins.—The statistics of the irrigation for which special returns are not made out are exhibited in the district irrigation registers. For the larger works or systems statements of cultivation and revenue have, in some cases, been prepared in the Revenue Department, and in others are under preparation. No revenue report is prepared by the canal administration, but the statements furnished by the Revenue Department are reviewed, and the results of successive years compared. Canal officers require

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Madras.

to know during the season what areas are being irrigated, and the administrative officers need to be informed what are the results of each season's irrigation, in order that all necessary improvement of management may be ascertained and introduced. Lastly, the net results have to be incorporated in the financial accounts of the works. Accurate statistics, including the quantities of water consumed in the irrigation of given areas, are of great importance, not only to the efficient management of existing works but as a guide to the probable results of proposed works.

The degree of detail should differ for the several offices.

The officer in charge of a canal should know what area is irrigated in each village; for he has to supply the water accordingly, and he has to watch variations of area, and to understand their causes.

A superintending engineer and a chief engineer require to compare by canals actual with anticipated areas of irrigation, and to watch the progress of extension of irrigation when not fully developed. They must judge for the most part by results whether the detailed administration is thoroughly efficient.

The annual reports on the season's irrigation are the most convenient place for the record of statistical information for each year; and this should afterwards be so posted up in abstract as to enable comparisons to be made for a series of years for any one system of irrigation and in due course between systems. Under the arrangements in force in this Presidency, the final areas and revenue for the year must be furnished by the revenue officers. All statistics of water supply, consumption, cost of maintenance, &c. can be recorded by the canal administration.

Ch. IV. Qn. 17.

QUESTION 17.—SOME MISCHIEVOUS EFFECTS OF CANAL IRRIGATION.

What evidence is there as to any mischief being caused by canal irrigation, such as by increasing sickness or injury to the land by raising the water-level or production of efflorescent surface salts, &c.? To what extent has drainage accompanied, or ought drainage to accompany, canal irrigation? Has the provision of needful drainage been neglected? Is additional drainage needed to meet the effect of the increased quantity of water thrown on the surface, or to remove obstructions caused by canals, channels, water-courses, &c.

Punjab.

PUNJAB.

Captain Ottley.—Before replying specifically to the above questions, it appears desirable to lay down, first of all, the conditions under which it is considered that a system of artificial drainage would be required in connection with any canal project.

It will be understood that as a general rule, and by the working of natural laws, the capacity of the natural drainages of any given tract will suffice for its ordinary rain-fall. In the event of an extraordinary rain-fall, and especially if this be sudden, the drainage lines may for a time become more or less gorged and consequently unable to afford the necessary relief, so that the land will be to a greater or less extent submerged. The result will be a temporary raising of the spring levels, and possibly an increase of sickness in the inundated tract.

Now, irrigation may be regarded as supplementing the natural rain-fall; and when the capacity of the natural drainage lines is insufficient to carry off both the rain-fall and the additional amount of water spread over the surface by means of irrigation, it becomes absolutely necessary to resort to artificial remedies.

Owing to the peculiar conformation of the country over a great portion of the Punjab, the capacity of the natural drainage lines is far in excess of what is required to carry off the rain-fall alone, and it is generally sufficient for the necessities both of this and of irrigation waters.

It need scarcely be said that it is of course imperative that these natural drainages should be in no way obstructed or interfered with.

It is now a well-understood principle of modern canals that they should be aligned so as not to obstruct natural drainage channels, the same principle holding good for distributaries as well as for the main arterial lines.

Nothing further appears to be required at first in the case of new canals which have been thus aligned, but after a canal has been opened, and irrigation to some extent developed, the springs will rise to a certain extent both in the vicinity of the canal and in the irrigated tracts; and whenever it is found that the natural drainage lines are insufficient, either in number or capacity, for the work they have to perform in preventing an excessive rise of the spring level, it will be necessary to apply local remedies, but it is obvious that no general rule can be laid down in this matter.

Thus, on the Bari Doab Canal, there are no channel specially made for drainage purposes, nor have any such cuts hitherto been found to be necessary.

In some places improvements to the natural drainage outfalls have been made, and projects for one or two such improvements are now under consideration, but the necessity for a regular system of artificial drainage does not exist, and that such is the case is to be attributed to the careful alignment of the main canal and dis-tributaries.

As bearing on this subject, the following extract (para. 37) from the Revenue Report of the Superintending Engineer Bari Doab Canal Circle for 1876-77 is given:—

> "37. Attention has been called to a considerable rise in the spring level, as indicated by the level of water in wells in Lahore and Amritsar.
>
> "The heavy rains of 1875 raised the springs in all the low-lands some 8 feet to 10 feet; this was rapidly subsiding when the rains of 1876 again caused a rise; this too is now quickly disappearing, and the springs are now (August 1877) about five feet above their normal level; it is to be remarked that this rise is observable in wells situated in or near a drainage.
>
> "The periodical observations of the height of surface of water in wells show that the wells in the vicinity of canal channels have not participated in the rise observed in wells in the lower lands."

As regards this canal also, it may be broadly said that there is no evidence of any mischief having been caused by canal irrigation either in increasing sickness or in injury to the lands by the raising of the spring level or by the production of efflorescent surface salts.

A similar statement may also be confidently made as regards all the Inundation Canals. The case of the Western Jumna Canal is, however, widely different. Here the old faulty alignment of the main canal and the absence of proper distributaries are entirely responsible for the obstruction of the natural drainage channels and the consequent water-logging of the low-lying tracts.

The alterations of the alignment of the canal which are now in hand, and indeed in great part completed, as well as the construction of properly aligned distributaries (which will replace the numerous village water-courses now in use) will, when completed, permit the re-opening of the natural drainage lines, and this alone will in great part relieve the evils now complained of.

Where these natural drainages are known to be insufficient to carry off both the water spread over the surface by irrigation, and the rain-fall (which is more abundent in some of the tracts watered by this canal than elsewhere in the Punjab), they will be supplemented by artificial cuts, the scheme for which is now under elaboration. These artificial canals cannot, howveer, for obvious reasons, be constructed until the present irrigation has been provided for by the new system of distributaries.

The increased sickness in some tracts (notably in the Karnal and Delhi districts) watered by the Western Jumna Canal long since attracted attention, and special investigations into the causes and possible remedies have more than once been made.

In 1856 the matter was brought to the notice of the Supreme Government, but attention was diverted from the subject by the mutiny, so that it came to pass that action was long deferred. In the end, however, the remodelling project now in hand was sanctioned by the Secretary of State, and the work was commenced which, it is confidently believed, will within the course of a few years entirely remove the evils complained of.

It is especially interesting to note that the observations which have been made above were confirmed by the state of this country in 1877, when it was fully shown that a greater accumulation of water on the surface than the drainage (whether natural or artificial) can carry off in a reasonable time is the real cause of the evils which are usually attributed to canal irrigation, and that it makes no difference whether such accumulation is derived from canal or rain water or from both combined. The year 1877 was one of drought, and to meet the wants of the cultivators a very much larger supply of water than usual was forced down the Western Jumna Canal and spread out over the land; nevertheless all the swamps decreased in area largely, and many villages which, owing to the water-logging of their lands, had previously resigned canal water, eagerly applied for its restoration to them.

Again an inspection of the higher lands and drier tracts watered by the Bootana Branch of the Western Jumna Canal conclusively shows that there is nothing mischievous in the use of canal water if only the channels be properly aligned. It is not too much to say that, although irrigation is of very long standing in these parts, it would be difficult to find anywhere finer cultivation and a more complete absence of all the evils which are so commonly supposed to be the necessary accompaniments of irrigation from this old canal.

As regards the liability of irrigation to increase the production of efflorescent salts, it may be sufficient to remark that ordinarily such increase only occurs where the soil was originally impregnated with them to a great extent, and that it then occurs whether the irrigation is derived from wells or canals. The evil can scarcely be said to exist to an appreciable extent on the Bari Doab Canal, and appears to be even stationary on the Western Jumna Canals. It is believed that there is a general consensus of opinion among canal officers in this province, that the best way of treating such soils is to leave them alone.

It is understood that a report of a committee, assembled at Allygarh in the spring of 1877, to investigate into this subject, has been published; it has not, however, been received in this office up to date, although it has been asked for both from other Departments in this Province and also from the Irrigation Branch of the North-Western Provinces.

The following extract from Major Earle's Revenue Report of the Western Jumna Canal for the year 1868-69 may be found interesting:—

"75. In conclusion, I may observe that reh (salt efflorescence) on land about the canal, to some extent, appears to be decreasing.

"Mr. Duncan states in his report this is the case along the canal in the Karnal district, and that the land seems to be recovering itself. When inspecting the Delhi division, I observed the same down there, and was informed that much of the land that had for years remained useless on account of Reh, was now being brought under cultivation again, and I was shown some such land with a fine crop of sugar-cane on it. I can only attribute this to the attention which is paid to the draining of the country as much as possible, by either closing the canal itself, or the Rajbuhas, and passing off by means of them as much drainage water as it is possible to do.

Mr. O'Brien.—The only mischief caused by canal irrigation is that described in the reply to the questions received with your F—39, dated 13th August 1878. No system of drainage has ever accompanied canal irrigation in this district. Nothing has ever been done here except to make here and there water escapes in sudden emergencies, such as dangerous floods. Drainage is decidedly necessary, for in many parts the excess water from canals collects in such quantities as to destroy crops and cause houses to fall down.

Mr. J. B. Lyall.—In a dry rainless country like Muzaffargarh, canal irrigation seldom or never requires to be accompanied by drainage; it does not appear to bring sickness to any serious extent; the water is muddy, and its use generally tends to improve the soil.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Board of Revenue.—Evidence is hardly needed to prove facts which are notorious, and the existence of which is denied by no one. It is notorious, and is admitted by all, that tracts which were formerly healthy have become unhealthy after the introduction of canal irrigation unaccompanied by drainage. The Board can vouch, from personal observation, that the Ganges canal has raised the spring level of the country through which it passes to such an extent as to convert land formerly fertile into swamps. No one can ride through the canal-irrigated parts of the Aligarh, Mainpuri, Etawah, Farukhabad, and Cawnpore districts without seeing a very great development, both of swamp and *reh*, much greater than is met with in the adjoining tracts, which are beyond the influence of the canal. "A reference to Doctor Cutliffe's Sanitary Report on certain districts of the Meerut division, published in 1868, pp. 35-8 will (Mr. Sladen writes) explain the mischief caused by canals in increasing sickness."

As to the great and, indeed, only remedy for such evil, *viz.*, drainage, and the extent to which it has been, and is now being, provided, the Board are entirely in accord with Mr. Webster, from whose reply they quote:—

"The remedy for these evils is, of course, drainage, which always should accompany irrigation from canals '*pari passu;*' in fact Sir Proby Cautley, when designing the Ganges canal and its distributaries, did propose a concurrent system of drainage, which, had it been adopted, would doubtless have averted the evils which arose from canal irrigation, and which were too long allowed to work their ill effects uncombated.

NORTH-WESTERN PROVINCES.

"However, matters are changed now; the Irrigation Department has loyally accepted its responsibility for the damage and injury done by injudicious irrigation; and comprehensive, and, it is hoped, efficient, drainage schemes are in hand, and, I believe, for the most part, well advanced."

Colonel Brownlow.—The records of the Governments of North-Western Provinces and Punjab must contain reports both on sickness and on injury to land by salt efflorescence produced by excessive canal irrigation and neglect of drainage. Until quite lately the drainage of tracts irrigated by canals has not received the attention which it ought to have done, and the responsibility for this neglect has not always rested with the local engineers. It is difficult to lay down any precise rule as to the extent to which drainage ought to accompany canal irrigation, as it will depend so much on the nature of the irrigation and the character of the soil in each locality. Canal channels ought *never* to obstruct drainage lines, and the use of drainage courses as irrigation channels ought only to be allowed on the express condition that, on no pretext whatever, shall the free flow of water be obstructed *at any season of the year*. These fundamental principles have been too often overlooked, and clearance of drainage lines is now required for removal of artificial obstructions as well as to neutralise the effects of marked rise in spring levels which must accompany widespread irrigation from a canal.

Mr. C. C. Anderson.—(1.) There has been a cry that canal irrigation has increased sickness —it is but a cry. Dr. Moir, Civil Surgeon of Meerut, who has given much time to the question, has on more than one occasion stated that the cases laid at the door of the canals are unfounded. Dr. Moir's reports should be read.

(2.) In the older canals drainage was not so much thought of as it is now in new projects, simply because the conditions, political and sanitary, were different then than now. Drainage works are divisible into two classes:—

(i.) Works for the prevention of interception of drainage.

(ii.) Works for improving natural obstructions and keeping down spring level. The first, such as syphons, &c., should accompany the construction of irrigation works. The second should only be taken in hand when necessity arises. To illustrate the two cases—

(a.) The Lower Ganges canal is carried right across the Doab, and consequently in its course crosses five main-drainage lines. The syphons and channels required for the free passage of the waters of these drainage lines must be constructed before the canal is opened.

(b.) A depression runs more or less parallel to the Agra canal for sixty miles. The spring level is from 10 to 15 feet below the surface. If what has taken place on the Ganges and Eastern Jumna canals takes place in the country commanded by the Agra canal, it will be obligatory to run a cut down the centre of this depression. To have made the cut at the same time as the canal would have been waste of money, for if would have been dug years before it was required. It will be time enough to think of making the cut when the facts that are recorded monthly show a perceptible rise in the spring level.

(3.) The provision for needful drainage has not been neglected, as even so far back as 1828 cuts were designed and excavated by Sir Proby Cautley, then Lieutenant Cautley, on the Eastern Jumna Canal. Again, in the Ganges canal, certainly over 100 miles of cuts were dug before the waters were admitted into the canal.

(4.) Additional drainage works are needed more to meet the effect of the increased quantity of water brought on to the land than to remove obstructions caused by canals, channels, watercourses. Close the Ganges canal for 10 years, and 50 per cent. of the drainage works constructed during the last 10 years will never have a drop of water in them.

BENGAL.

BENGAL.

Colonel Haig.—We have no evidence yet of any mischief being caused by canal irrigation in the shape of sickness or deterioration of soil. The paramount necessity of drainage is fully recognised, but the works for this purpose have rather lagged behind those for irrigation in Orissa. In Midnapore and on the Sone Canals both have advanced *pari passu*.

In Bengal, where almost the whole of the irrigation is khureef, the land has complete rest during half the year—and that the dry half—so that irrigation probably produces no effect whatever upon the degree of saturation of the soil or on the climate. On the Sone, half the irrigation will be rubbee, for which the water-supply is estimated to suffice for 250 acres per square mile, or 39 per cent. of the gross area. This is the very largest proportion of the whole area that can be under irrigation at one time. The country there has good slopes, and the drainage is excellent.

BOMBAY.

BOMBAY.

Colonel Anderson.—Too little canal irrigation in Bombay to justify any decided opinion, but in one case, below Madak tank in Dharwar, an increase of fever is alleged as a result of increase of irrigation, and on the Krishna Canal at Karar continuous irrigation with the canal water is said to damage the land. Further experience will be required to ascertain the truth of this. Both works are of comparatively recent date.

Mr. Propert.—There is no evidence as regards my own district to show that sickness, or injury to the land, by raising the water level, has been caused by canal irrigation, nor have efflorescent surface salts been produced. In the case of Khandesh the natural drainage is ample. The superintendent of the Government farm at Bhadgám considers that drainage in Khandesh would be a great mistake under any circumstances whatever.

MADRAS.

MADRAS.

Mr. Sullivan.—In 1871-2 it was reported to Government that fever of a low type had appeared in the Godavori district, which work was attributed to the extension of canal irrigation, and the late Surgeon-Major Wright was specially deputed to investigate the matter. That officer's report is not at the moment available, but it is known to the undersigned, who was at the time collector of the district, that Mr. Wright, after very careful local inquiry throughout the delta taluks, came to the conclusion that the sickness then prevailing was not attributable to the canal irrigation. He inclined to the opinion, which was shared by the

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Sanitary Commissioner, that it was, in a great measure,* due to an excessive consumption of opium. A good proof that he was right in his conclusions may be found in one of the oldest of our military cantonments.

Trichinopoly, which is considered one of the healthiest stations for troops, is traversed by a large irrigation canal taken off the Cauvery, and is almost surrounded with wet cultivation. This work was in existence when the country came into the possession of the English, so that there has been ample time to settle the question as to whether it has a malarious influence or not.

In regard to the efflorescence of surface salts, locally known as "chavadu," or Anglicised "soud," there is no doubt that in certain descriptions of soils this effect is produced, in a more or less degree, when irrigation is first applied. The salts present in the soil deliquesce, and are held in suspension in the water until evaporation takes place, when a saline deposit is left on the surface. But fortunately the water, which has the effect, above described, of making sterile lands which previous to its application were fertile, brings with it a remedy in the shape of a rich alluvium; and, if the floodings are continued, this deposit, combined with the application of leaf manures, reduces the excess proportion of salts to their proper limits, and the land again becomes fit for cultivation.

Lieut.-Colonel Mullins.—There is no accepted evidence that irrigation is injurious to health in any of the great fields of irrigation in this Presidency. There was an impression that fever was the result some few years ago in the Godavari delta; but it was shown that, though fever was in one or two seasons very prevalent there in cold weather, it was demonstrated that it was more prevalent and of a more severe type in the upland and unirrigated parts of the district.* The population of the Godavari, Kistna, and Cauvery deltas compares favourably as regards health with that of localities where irrigation is absent. The extent of land injured by efflorescence and surface salts is small. On the other hand, the area of barren land in the coast swamps made arable, and often ultimately very valuable, by washing out the salt, is very considerable. All deltas need more or less drainage; some localities more, and some less or none at all. It is a necessity of the manner and of the progress of formation of these alluvial tracts that the level of a good deal of the country should be low while the coast formation and the tendency which there exists to throw up bars at the outfalls of the rivers and sand dunes makes artificial arrangements requisite for the relief of the lands. Delta lands do not ordinarily drain direct into the rivers, but the slope of the country is from the rivers first and generally parallel to them afterwards.

Every part of every large tract of irrigated country needs to have its requirements as regards drainage investigated and provided for. Generally, the surplus irrigation water to be disposed of is insignificant compared with rain-fall drainage. It is the latter rather than the former which occasions such difficulties as are met with in the principal fields of irrigation in Madras.

Mr. Foster.—It is difficult to say whether any mischief has been done by canal irrigation by sickness. The statistics of births and deaths are not sufficiently reliable even now, and they were worse before the anicut was built, so that it is impossible to compare the two with any good effect. Before the anicut was made the delta still had the same quantity of water, and perhaps more than it has now, but it was distributed in a less orderly manner. There is no doubt now that there is a marked distinction in the statistics of fever between the delta and the upland taluks, and I am inclined to think it is a different type of fever. The delta fever begins one month earlier in the year than the upland fever, though they both remain at their height for about three months, from July to October; in the upland taluks the fever decreases, but in the delta it increases, during those months. I certainly think that irrigation (whether by distribution by canal, or by overflowing of the river, I cannot tell) has some effect on sickness. I have not heard of any injury done to the land by raising the water level or by the production of efflorescent surface salts.

Drainage has been carried on to a considerable extent of late years; it was, in my opinion, neglected at first; it would certainly have increased greatly the expense of the works in the first instance. Drainage should, I think, be carried out so as to afford no hindrance to the natural flow of water, except in such cases where the water is held up for use, and is not allowed to become unpleasantly stagnant. We have not yet done all that might be considered necessary, but drainage works are in progress.

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* Low latitude and proximity to the sea appear to be favourable to health in irrigated tracts.

QUESTION 18.—PURIFICATION OF SOIL.

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Has canal irrigation anywhere been combined with attempts to improve soils previously unfit for cultivation from the presence of noxious salts?

PUNJAB.

Punjab.

Captain Ottley.—Yes, a very notable case on a small scale is that of the Lawrence Hall Gardens at Lahore. A few years ago the ground here was white with reh efflorescence, and the locality might have been fairly instanced as a singularly bad case of the evil. So bad was it that it seemed hopeless ever to expect any good result from the experiments which were to be tried on it. By dint, however, of frequent floodings or washings with canal water, aided by drainage and careful and intelligent supervision, it would seem that the salts have been at last got rid of; at any rate they do not now come to the surface of the ground, and certainly the luxuriant vegetation in the gardens at the present time would seem to indicate that the evil has been really removed.

The case of these gardens is especially interesting, as some of the members of the Famine Commission must have had an opportunity of satisfying themselves that the evil does not now exist, while others will probably be able to testify to its existence in an aggravated form previous to the introduction of canal irrigation.

IV. Qn. 18.

NORTH-WESTERN PROVINCES.

North-Western rovinces.

Board of Revenue.—The Board are not aware of any attempt having been made to improve soils previously (*i.e.*, before the introduction of canal irrigation) unfit for cultivation, in combination with canal irrigation. Experiments, on so small a scale, or under such exceptional conditions as to be of very little practical value, have been made, with a view of providing means for the reclamation of land rendered unfit for cultivation from the development of *reh after* the introduction of canal irrigation.

Colonel Brownlow.—Experiments on washing "reh" land free from salt were tried, on a most limited scale, on the Ganges Canal, but with, I believe, very doubtful success. I believe reclamation to be quite possible, as soon as the value of land in canal irrigated tracts rises sufficiently to admit of the requisite outlay on subsoil drainage.

Mr. C. C. Anderson.—Some experiments were made at Sikandra Ráo four years ago, but these were not made with view to destroying the salts. They consisted of laying a layer of fertile soil, canal silt, on the barren ground. The results were not financially successful.

MADRAS.

Madras.

Mr. Sullivan.—In this Presidency it is believed that no such attempt has been made; but as it has been practically demonstrated, as stated above, that the alluvial deposit brought down in the floods of the great rivers can, and does, neutralise the effect of earth-salts where they are found in excess, it would be well worth while trying the experiment of flooding the large saliferous tracts which are to be found near their mouths. Saturated as they are with saline matter, it would, of course, take some time before their sterility would be overcome, but of the ultimate success of the experiment there can be but little doubt. Such tracts, which now produce nothing, might be granted on favourable leases, and water for flooding supplied gratis during the time the rivers were in fresh. Were such inducements held out, it is believed that 10 years or so would suffice to convert these sterile wastes into food-producing areas.

Lieut.-Colonel Mullins.—The salt swamps in the lower parts of the Godavari and Kistna deltas have been reclaimed and converted into fertile lands by means of the water supplied from the canals. This process is going on year by year, and the change in the last few years in the appearances of the country in the localities referred to is very marked.

Captain Brockman.—Yes. I remember that, in the Godaveri system of canals, canal water is granted free of water-rate for two years for flooding salt lands, and this privilege is frequently taken advantage of in lands near the sea-coast.

IV. Qn. 19.

QUESTION 19.—GENERAL EFFECT OF IRRIGATION ON CHARACTER OF CULTIVATION.

What has been the general effect of continued canal irrigation on the character of the cultivation? Has the irrigated area of the poorer grains which supply the chief part of the food of the people been gradually diminished, and has the area of the better crops been increased? If the area of poorer crops has been reduced, is this due to conditions of soil or position of lands and difficulties of access from the water-supply or to the relative profits in the one case being greater than in the other? State the general facts as to the changes in the areas irrigated during the last 10 or 12 years, and make any comments that seem desirable. Is there reason to suppose that prolonged irrigation damages the land under any circumstances? Is there any evidence of a reduced production?

PUNJAB.

Punjab.

Major H. Grey.—Canal irrigation has greatly increased the cultivation of valuable crops, in supersession of that of the poorer staples in the Bahawalpur State, and is doing so in the Ferozepore District. Where the conditions of soil, position, and water supply permit, the zamindars put in indigo, cotton, sugar, and rice in place of less valuable crops.

Of course there is a limit to this in respect of water supply. Rice takes six times as much water as jowar, bajra, and the lighter kharif crops; sugar four times as much; indigo and cotton three times as much, and for second year or third year indigo. Moreover, the flow must be very early; not later than the commencement of March.

On the other hand, canals, both here and in Ferozepore, have permitted the cultivation of cereals, where without them such could not have been sown; or at any rate matured. Thus, though causing the supersession of the poorer by the more valuable crops over large areas, canals have, in my experience, not diminished the actual area of cultivation of the poorer grains.

The productive power of land is certainly reduced where irrigation has long been applied. This, however, has nothing to do with the irrigation, but results from the shortsightedness of the zamindars, who overwork the land and are long in learning to use manure.

Captain Ottley.—The questions above asked do not admit for the most part of a reply from the Irrigation Department.

It would appear that the only way of obtaining a satisfactory answer would be to compare the arrears and distribution of the total crops of a tract before and after the introduction of canal irrigation. This information could be furnished from the settlement records alone, and to these this Department has no access.

Statements have been prepared showing the irrigation in detail for both the Western Jumna and Bári Doáb Canals for 15 years and 13 years past respectively.

From an inspection of these statements it will be seen that the total acreage irrigation varies, as might

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PUNJAB.

be expected, with the rain-fall as well as with changes in the incidence of the charges for water.

It will also be observed that the acreage of some crops, such as cotton, for instance, appears to depend to a very great extent on the greater or less demand which may exist in the markets for that particular commodity.

An inspection of the returns of the Western Jumna Canal will show that ordinarily no very great variations occur in the areas of the more valuable crops, such as sugar-cane, rice, and the various dyes, spices, oils, &c.; whereas the poorer cereals and the pulses are only, as a rule, cultivated by the aid of the canal water to any great extent in years of drought. The very large acreage of fodder crops on the Bári Doáb Canal, as compared with that on the Western Jumna Canal, is worthy of remark, and is clearly due to the former passing through a very much drier tract than the latter.

It is believed that it will be apparent from the statements given that in ordinary years the better classes of crops are alone cultivated with canal water, and that in these years the poorer grains are grown by the aid of the rain-fall. In years of drought these also require artificial aid, without which their cultivation would be impossible.

Although, as previously stated, it is impossible for this Department to show conclusively the effect of the introduction of canal irrigation on the general cultivation of the tract under its influence, still, from observation, it is believed that as a matter of fact the area under the poorer crops has really not decreased, at any rate to any great extent, but that the total area of cultivation has been increased by an increase in the area under the better crops. It should also be borne in mind that the poorer cereals and the pulses form the food staple of the very poorest classes alone, for it is believed that with this exception the mass of the population consume wheat and barley, and these grains form, as will be seen, a very large proportion of the crops cultivated by the aid of canal water.

The only reason for the cultivation of the better class of crops, when canal irrigation is used, is the relative greater profit which is thus obtained.

With regard to the last question, it may be said that there is no evidence of reduced production, and that it is considered that prolonged irrigation does not damage the land in any way, providing that the drainage of the tract is attended to in the manner described in the reply to question 17.

The produce per acre and the rate per rupee of such produce, as shown in Form No. VII. of the Superintending Engineer's Revenue Reports, are furnished yearly by the District Officers to the executive engineers of the various canal divisions.

The following figures extracted from these returns show the estimated amount and value of the crops grown, in 1877–8, on the two permanent canals of the Punjab:—

Food Grains.	BÁRI DOÁB CANAL.		WESTERN JUMNA CANAL.	
	Maunds.	Rupees.	Maunds.	Rupees.
Cereals:—				
Wheat, barley, mixed grain - -	2,630,425	52,60,850	2,866,829	70,90,170
Rice - - - - - -	460,319	9,20,638	709,808	22,16,367
Cereals:—				
Jowár, kangní, maize - -	700,207	14,00,414	650,144	17,14,547
Pulses:—				
Gram, masúr chiná - - - -	168,853	3,15,017	200,424	4,52,231
Total food grains -	3,959,804	78,96,919	4,427,205	1,14,73,315

Total amount of food grains on the two canals during 1877–78, maunds 8,387,009, valued at Rs. 1,93,70,234.

In other words, the two permanent canals of the Punjab (the Bári Doáb and the Western Jumna) enabled the cultivators to grow some 300,000 *tons* of food grains in a year when, owing to the drought, it would have been impossible to raise these crops without irrigation. Moreover, it is estimated that the value of other crops (such as sugar-cane, dyes, oils, spices, vegetables, &c.) grown during this same year amounted to Rs. 94,59,366 (*i.e.*, Rs. 13,76,166 on Bári Doáb Canal and Rs. 80,83,200 on Western Jumna Canal), and that thus the country was enriched and better able to bear the stress of scarcity and high prices.

BARI DOAB CANAL.

	1865–66.	1866–67.	1867–68.	1868–69.	1869–70.	1870–71.	1871–72.	1872–73.	1873–74.	1874–75.	1875–76.	1876–77.	1877–78.
Rainfall — Kharif	Scanty.	Scanty.	Scanty.	Drought.	Fair.	Scanty.	Good.	Good.	Fair.	Very good.	Good.	Very good.	Very scanty.
Rainfall — Rabi	Good.	„	„		Good.	„	Scanty.	„	Very good.	Scanty.	Very good.	Good.	Good.
Other Causes					Water advantage first began to be charged during rabi.	Differential rates introduced from rabi.							Great export of grain to Madras.
BETTER CLASS OF CROPS.													
Sugar cane (annual)	9,180	9,156	10,601	9,811	11,623	6,994	6,287	9,158	10,305	8,900	8,729	7,496	6,339
Rice (kharif)	53,564	57,605	63,962	41,256	76,709	24,716	11,598	29,094	32,882	27,638	24,511	27,049	24,245
Cotton (kharif)	5,235	12,511	21,101	8,205	11,671	11,228	20,387	27,537	27,868	17,612	33,215	19,676	10,545
Wheat and barley (rabi)	64,541	113,704	129,934	185,510	95,553	162,301	173,354	103,872	99,039	149,682	92,247	96,970	138,095
Vegetable (kharif and rabi)	207	630	583	731	3,786	3,247	Not shown	2,449	2,053	2,040	1,119	1,632	2,240
Total	132,727	193,606	226,181	245,513	199,342	208,486	211,626	172,110	172,147	205,872	159,821	152,823	181,464
POORER CLASS OF CROPS.													
Cereals.—Jowar, bajrá, kangní, maize, mixed grains.	7,205	4,451	5,338	18,135	10,743	34,025	29,352	20,911	19,604	22,980	20,768	12,724	37,716
Pulses.—Urd, chiná, moth, gram, masur, &c.	2,902	3,752	3,320	6,478	6,085	6,739	12,513	7,623	9,653	8,690	4,646	4,675	10,424
Fodder.—Charri, sinji, grass, &c.	24,160	19,543	23,244	16,172	9,220	13,525	13,499	14,869	13,988	16,744	20,971	20,495	15,379
Total	34,267	27,746	31,902	40,785	26,048	54,289	55,364	43,403	43,245	48,414	46,385	37,894	63,619
Total of above totals	166,994	221,352	258,083	286,298	225,390	262,775	266,990	215,513	215,392	254,286	206,206	190,717	244,083
Total irrigation, including dyes, oils, spices, tobacco, &c.	175,979	228,452	262,128	299,834	233,927	279,210	287,070	228,796	232,146	279,813	214,599	202,712	266,955

NOTE.—Up to the rabi of 1870–71, a uniform rate of Rs. 2–6–8 was charged for all descriptions of crops. From that date the following have been the flow rates, the lift rate being half of these :—sugar-cane, Rs. 6–0–0; rice, 4–12–0; cotton, wheat, barley, and vegetables, Rs. 2–8–0; jowar, bajrá, kangní, maize, gram, masur, urd, grasses, simji, Rs. 1–8–0 per acre.

WESTERN JUMNA CANAL.

	1863–64.	1864–65.	1865–66.	1866–67.	1867–68.	1868–69.	1869–70.	1870–71.	1871–72.	1872–73.	1873–74.	1874–75.	1875–76.	1876–77.	1877–78.
Rainfal – Kharif	Fair.	Scanty.	Very fair.	Scanty.	Good.	Drought.	Scanty.	Fair.	Good.	Very good.	Very good.	Good.	Very good.	Fair.	Drought.
Rainfal – Rabi	—	Very scanty.	Good.	Very scanty.	Very good.		Very scanty.	Scanty.	Scanty.	Fair.	Good.	Scanty.	Very scanty, but the very heavy rainfall of September enabled rabi crops to be grown without canal water.	Scanty.	Fair.
Other Causes				Increase of rates and differential rates introduced from 1st November 1876.							Revision of settlement in progress.	Revision of settlement in progress.			
Better Class of Crops.															
Sugar-cane	30,089	29,786	34,028	19,774	27,209	38,431	45,122	39,878	31,325	40,545	42,068	33,439	26,564	34,602	42,135
Rice	47,353	57,157	51,517	62,071	39,456	33,490	46,705	45,862	32,974	43,143	43,818	50,029	51,827	46,074	34,733
Cotton	45,882	77,738	62,684	1,04,796	98,801	74,876	80,093	98,445	1,00,951	96,129	54,806	58,236	69,577	76,616	65,989
Wheat and barley, and mixed grains.	1,45,234	2,01,300	1,73,775	1,91,471	1,25,707	2,37,550	2,14,173	2,09,643	2,19,608	1,14,364	1,00,195	1,74,409	87,115	1,52,981	2,29,019
Vegetables, including chillies, singharas, &c.	Not known	1,126	2,811	6,365	5,098	8,182	7,862	6,930	6,221	4,554	3,107	4,287	4,014	5,008	2,845
Total	—	3,67,107	3,24,815	3,84,477	2,96,271	3,92,529	3,93,955	4,00,760	3,91,079	2,98,735	2,43,994	3,20,400	2,39,097	3,15,281	3,74,721
Poorer Class of Crops.															
Cereals.—Jowár, bájri, kangni, maize, &c.	Not known	13,770	35,672	15,418	11,241	39,331	49,503	18,818	10,052	6,345	8,792	8,228	16,782	8,566	43,222
Pulses.—Urd, mote, grám, masur, &c.		20,770	1,450	3,626	1,468	31,027	25,355	19,437	20,236	10,081	12,017	19,762	8,072	11,364	26,132
Fodder.—Lucerne, chari, grass, singi, &c.		1,481	1,631	1,145	240	729	623	550	658	552	886	892	762	1,169	1,812
Total	—	36,022	38,753	20,189	12,949	71,087	75,481	38,805	30,946	16,978	21,695	28,882	25,616	21,099	71,166
Total of above totals	—	4,03,129	3,63,568	4,04,666	3,09,220	4,63,616	4,69,436	4,39,565	4,22,025	3,15,713	2,65,689	3,49,282	2,64,713	3,36,380	4,45,887
Total irrigation, including dyes, oils, spices, tobacco, &c.	3,51,537	4,34,965	3,97,963	4,47,171	3,31,037	4,86,878	4,96,542	4,62,707	4,44,385	3,51,821	3,11,747	3,82,847	3,09,595	3,66,482	5,07,974

Note.—From March 1855 the flow rates had been Rs. 1–3–2 per acre for first-class, and Rs. 0–10–8 for second-class crops; the lift rates being two thirds of these. These rates were slightly in excess of those which had been in force since 1827. From the 1st November 1866 (*i.e.*, commencing with the rabi of 1866–67), the following differential flow rates were imposed:—sugar-cane, Rs. 5; rice, tobacco, opium, vegetables, and singharas, Rs. 3–0–0; indigo, cotton, and all rabi crops (such as wheat, barley, china, gram, and other pulses), Rs. 2–4–0; all other kharif crops (jowár, bájra, Indian corn, kangni, &c.), Rs. 1–10–8,—the lift rates being still about two-thirds of above

NORTH-WESTERN PROVINCES.

The Board of Revenue.—Mr. Webster has pointed out that the poorer grains, which supply the chief food of the people, are not as a rule irrigated at all. They depend for the most part on the rain-fall. He thinks there is no reason to believe that the area on which they are produced has decreased in consequence of an increase in the area on which the better crops are grown, the soil adapted for the productions of the poorer grains not being suitable generally for the growth of the poorer crops. Mr. Sladen, from an eximination of a statement of areas of different crops irrigated from the Eastern Jumna Canal, in the Saharanpur district, for the past 10 years (which statement the Board enclose with their report), arrived at the conclusion that, reckoning gardens and orchards, sugarcane, rice, wheat, barley, cotton, and indigo as superior crops, the area under superior crops has increased and that under inferior crops has diminished. Mr. Sells, in his reply to question 19, has given the areas covered by different crops in the canal-irrigated parts of the Muzaffarnagar district for 1876–77 and the seven preceding years. "The above "figures show," he writes, "that the canal-irrigated "crop fluctuates greatly, and in rather a capricious "manner, especially observable in the case of *rice* "and *gram.* Turning to individual crops, the chief "increase (in the areas of 1876–77, as compared with "those of 1872–73) has been in wheat, 17,141 acres; "maize, 2,131 acres; sugarcane, 5,571 acres; cotton, "620 acres; indigo, 753 acres; mixed cereals, 431 "acres. The main result is that food-grains have "not been driven out of the field at all by the more "paying life-sustaining crops; and the figures also "show plainly, I think, that canal irrigation has had "no appreciable effect in diminishing the area given "to the poorer class of food-grains."

Mr. Wright, Settlement Officer of Cawnpore, noting that it is generally supposed that the extension of canal irrigation has largely stimulated the cultivation of wheat, indigo, and gram, shows, from a comparison of the cultivation at the former and at the present settlement, that such does not appear to have been actually the case, with the exception of indigo, the earlier returns regarding which Mr. Wright does not altogether credit. The area under wheat has fallen from 81,792 to 73,730 acres, while that under barley, a crop which receives irrigation less seldom than wheat, has risen from 129,104 to 327,092 acres. On the other hand, the area under rice and maize had risen from 4,586 and 654 to 27,735 and 24,085 acres. No returns or replies from any other districts have been received. They will be forwarded to the Famine Commission hereafter. The Board have little doubt that when land hitherto unirrigable, except at a great cost, if at all, is made easily irrigable, and irrigable too at a comparatively small cost, the superior crops, which can be grown only or with greater certainty with irrigation, must to some extent displace the inferior, which were grown on certain descriptions of land, not only because they are of poor quality, but are also unirrigable. Moreover, the poorer crops are raised in the autumn, while the superior crops are grown in the winter and in the spring. Canal water is far more valuable in the latter than in the former season. It may be more profitable to grow an inferior crop without the aid of artificial irrigation, trusting to the usual rain-fall, than to a superior crop, which demands a larger outlay in its cultivation.

Col. Brownlow.—The first effect of canal irrigation is, so far as my experience goes, to extend widely the area of annual cultivation of ordinary crops. The facility of irrigation and large amount of labour thereby set free leads to the occupation and breaking up of all available land that may remain uncultivated in a village. Then as the cultivators gradually acquire capital, the cultivation of the superior crops supersedes that of the poorer kinds; sugarcane, rice, indigo, and wheat replace the various kinds of millet and other inferior grains. The greater profits of the better classes of crops naturally bring about this result. No detailed information regarding crops watered is given in the irrigation revenue reports for years previous to 1859–60 for the Eastern Jumna Canal and 1865–66 for the Ganges Canal. In the former year the Eastern Jumna Canal had been 20 years, and in the latter year the Ganges Canal had been 10 years in operation. The areas given below seem to indicate a steady increase in the area of first-class crops watered, although the proportion borne by them to the total area fluctuates, according to the nature of the season. On the Eastern Jumna Canal the irrigation of sugarcane, rice, wheat, and orchards—

During the two years 1859–60 and 1860–61 amounted to - -
During the two years 1865–66 and 1866–67 amounted to - -
During the famine year 1868–69 amounted to - - -
During the two years 1875–76 and 1876–77 amounted to - -

On the Ganges Canal the irrigation of sugarcane, rice, wheat, orchards, and indigo—

During 1865–66 and 1866–67 amounted to - - -
During 1868–69 amounted to -
During 1875–76 and 1876–77 amounted to - - -

The facility afforded for overcropping the land is one of the greatest drawbacks of canal irrigation, and though I have no figures to prove reduction in fertility of land from this cause, yet, when it is remembered that the double-cropped land is rarely manured, there seems to be good reason for accepting the commonly-received opinion on the Eastern Jumna Canal that ordinary land irrigated from the canal does not yield as much now as it did 20 years ago. It is, however also allowed that but for the fertilising properties of the mud suspended in the canal water during the summer and autumn, the falling off in the productive power of the land would have been *much* greater than it has been.

Captain Tickell.—To produce an increase in the more valuable crops. The increase in sugar cultivation has been the most marked in this division. This is believed to be due to the greater profit derived.

The following is a comparison between the areas under several crops in this division in 1868–69 and 1877–78:—

Year.	Sugar.	Cotton.	Rice.	Other Crops.	Total.
1868–69 -	6,913	1,634	18,272	3,261	30,080
1877–78 -	15,433	3,067	11,623	5,557	35,680

Mr. C. C. Anderson.—Canal irrigation tends to th substitution of the more valuable for the poorer crop in good soil. Thus, barley and gram will be replace by wheat and sugar. The poorer lands, which, prio to canal irrigation, produced bajra and some kind o vetches, are only irrigated in years of drought.

The poorer grains are only irrigated in exceptiona years; the introduction of canal irrigation has not the affected the irrigated area of such crops.

The decrease in the area, not the irrigated area of poorer crops is due entirely to conditions of soil and the relative profits in the one case being greate than in the other.

The rabi areas irrigated by the *Eastern Jumn and Ganges canals since 1868 are given below. The speak for themselves*:—

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NORTH-WESTERN PROVINCES.

RABI IRRIGATED AREA.

Canal.		Year.	Gram.	Barley.	Wheat.	Total Rabi.	Rabi.		
							Gram.	Barley.	Wheat.
GANGES - -	I.	1876–77	10,025	153,551	385,362	592,951	1·79	25·90	64·91
		1876	14,488	178,941	329,186	571,842	2·53	31·29	57·56
		1875	21,275	199,831	331,709	602,815	3·52	33·14	55·02
		1874	13,536	180,225	286,091	507,472	2·66	35·51	56·37
		1873	17,216	152,216	242,518	437,979	3·93	34·86	55·37
	II.	1872	8,982	93,068	249,254	373,867	2·40	24·89	66·66
		1871	15,725	125,644	333,512	499,931	3·14	25·13	66·71
		1870	25,961	123,144	264,371	438,560	5·91	28·07	60·28
		1869	39,985	242,354	418,228	734,132	5·44	33·01	56·96
		1868	13,274	88,156	231,559	348,319	3·8	25·3	66·5
EASTERN JUMNA - -		1876–77	29	2,120	96,792	104,397	0·27	2·03	92·71
		1876	3,818	1,617	97,223	108,552	3·51	1·48	89·56
		1875	4,252	1,703	88,109	101,272	4·19	1·68	87·00
		1874	1,992	1,381	85,864	97,570	2·04	1·41	88·00
		1873	3,040	3,196	89,394	104,455	2·91	3·05	85·48
		1872	4,753	4,202	100,589	120,345	3·94	3·49	83·58
		1871	3,368	5,347	98,166	114,603	2·93	4·66	85·65
		1870	6,670	8,018	106,653	131,903	5·85	6·07	80·85
		1869	8,602	9,004	146,340	172,276	4·99	5·22	84·94
		1868	3,121	2,400	94,089	103,938	2·9	2·3	90·5

	Ganges and Eastern Jumna.		Agra.		Rohilkhand.		Dún.		Bundelkhand.	
	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.	Flow.	Lift.
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.
Gardens - -	3 0 0	2 0 0	4 0 0	2 0 0	2 0 0	1 0 8	3 0 0	—	4 0 0	2 0 0
Sugarcane - -	5 0 0	3 5 4	6 10 8	3 5 4	2 8 0	1 10 0	5 0 0	—	6 10 8	3 5 4
Wheat - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Barley - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Rice - - -	5 0 0	3 5 4	6 10 8	3 5 4	2 4 0	1 8 0	3 0 0	—	6 10 8	3 5 4
Maize - -	1 10 8	1 0 0	2 0 0	1 0 0	0 4 0	0 2 0	1 4 0	—	2 0 0	1 0 0
Joar - - -	1 10 8	1 0 0	2 0 0	1 0 0	0 4 0	0 2 0	1 4 0	—	2 0 0	1 0 0
Gram - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Peas - - -	2 4 0	1 8 0	3 0 0	1 8 0	0 12 0	0 8 0	1 4 0	—	3 0 0	1 8 0
Fodder - -	1 10 8	1 0 0	2 0 0	1 0 0	—	—	—	—	2 0 0	1 0 0
Cotton - - -	2 4 0	1 8 0	3 0 0	1 8 0	—	—	2 4 0	—	3 0 0	1 8 0
Indigo - -	2 4 0	1 8 0	3 0 0	1 8 0	—	—	2 4 0	—	3 0 0	1 8 0
Opium - - -	3 0 0	2 0 0	4 0 0	2 0 0	0 8 0	0 4 0	3 0 0	—	4 0 0	2 0 0

The use of water does good, the abuse of it harm. Not aware of any.

BOMBAY.

BOMBAY.

Colonel Anderson.—No material change in Bombay in this respect during the last 10, or even 20, years.

Mr. Hughes.—The general effect of canal irrigation, so far as it has gone, has been to increase the area of the better class of crops, such as sugar and other garden crops, groundnut, and other similar crops which cannot be cultivated without the means of irrigation; but this cannot have affected the area of the poorer crops, nor is it likely it will ever do so in this Presidency. The area within the influence of our works can never bear a large proportion to the area available for cultivation in any district, and in every collectorate there is a large area of uncultivated culturable land available for the cultivation of the poorer grains should irrigation encroach upon the area at present devoted to those crops.

In one instance it is reported that the construction of a canal has had a marked effect on the cultivation. The Krishna canal in Satara traverses a district more favourably situated as regards rainfall, soil, and population than that under any other of our new works. The people, too, are better off. The principal crops irrigated from the canal are sugar, groundnut, and wheat. The area of groundnut varies very considerably. This crop is sown in the early part of the monsoon, but in the cold weather irrigation is essential except during years of exceptional rainfall. It is stated that the people avail themselves of the protection or insurance the canal affords to cultivate extensive areas of this valuable crop. If there is not sufficient rain during the cold weather, they apply for canal water and secure a good crop; but if sufficient rain falls, they enjoy the advantage of a good harvest without paying water-rate.

Mr. Propert.—The general effect of continued canal irrigation has been the extended production of a more valuable class of crops, and an improvement in the value of the crops formerly grown without irrigation. The new irrigation works of Khandesh have been opened too recently to allow of the preparation of statistics. Prolonged irrigation undoubtedly requires the free use of manure and a strict adherence to a proper rotation of crops. If these conditions be fulfilled, reduced production would be unlikely.

H. IV. Qn. 19.

Madras.

MADRAS.

Lieut.-Colonel Mullins.—In Madras rice or paddy is the chief irrigated crop. There are many different kinds of paddy. An abundant water-supply leads to the introduction of the better kinds of rice and to the improvement of the inferior kinds. The question probably refers to irrigated crops of a kind differing materially from the staple in Madras. Ragi, hemp, and many crops are grown before or after the paddy on the same lands, but they are altogether subsidiary to the main crop.

Some soils are much better suited than others for continuous irrigation. There are soils which have been certainly irrigated for 25 to 40 years which have increased in value greatly; and the prices which irrigated lands in Tanjore, and more especially in Tinnevelly, where as much as Rs. 3,000 an acre have been paid, indicate the belief of the natives that no deterioration of value is to be expected.

Mr. Longley.—In Salem, the poorer grains are grown on dry uplands, and not on irrigated areas, so that it is not probable that the irrigated areas would affect the cultivation of these dry grains, which are the staple food of the population. There is nothing to show if the extent, now irrigated by the Cauvery, was ever cultivated with the staple dry crop.

The cultivation under the channels during the last 10 years was as follows :—

Fasli.	Extent.	Revenue.
1277 - - - -	5,463	55,750
1278 - - - -	5,448	55,609
1279 - - - -	5,454	55,720
1280 - - - -	5,474	55,761
1281 - - - -	6,210	57,520
1282 - - - -	6,343	58,259
1283 - - - -	6,204	58,073
1284 - - - -	6,221	58,338
1285 - - - -	6,232	58,367
1286 - - - -	6,232	58,367

Owing to the sufficiency of supply, there were no appreciable fluctuations in the areas cultivated in the different years.

I have no reason to suppose that prolonged irrigation (provided the land is well manured for each crop) damages the land. It is probable that if the cultivator would give his land rest, and not raise five crops in two successive years, the land would produce heavier crops; but it will take a long time before the native cultivator will allow his land to rest. "As much as possible, and as quickly as possible," is the ryot's motto. His forefathers never fallowed the land, and why should he? Natives believe that the alluvial deposit brought down by the Cauvery when in flood regenerates the lands and prevents deterioration.

H. IV. Qn. 20.

QUESTION 20.—INUNDATION CANALS. WELLS.

Under what conditions is an inundation canal, giving water only during the rainy season, found to be useful? To what extent is it probable that such irrigation could be usefully attempted in the North-Western Provinces, or elsewhere where not now applied, and where a water-supply is available? How far would such irrigation be useful for rabi or kharif cultivation? How far may wells be depended on to supplement the deficiencies of supply in such a canal during the dry season?

Punjab.

PUNJAB.

Captain Ottley.—The conditions may be stated as follows :—

1. A short or uncertain rain-fall, rendering it impossible to grow crops without irrigation.
2. A river whose annual rise may be fairly depended upon both as to date and height.
3. A tract of country the surface of which can be easily watered by the usual rise of the river, and through which the canal can be cheaply made. It must also be of sufficient width to render the irrigation probably remunerative.
4. Lastly, as regards the rabi cultivation, a sufficient number of wells to mature the crops sown by the aid of canal water.

These conditions are fulfilled in most of the khadir or low lands bordering on the rivers of the Punjab. The rain-fall is exceedingly small at the best, and frequently fails almost entirely; the rivers are fed from the snows of the Himalayas, and rise with great regularity as summer approaches; the khadir tracks have but a small elevation above the river beds, and the country slopes on either side from the river, whilst the existence of old disused river channels frequently enables a canal to be cut with but a small expenditure of money.

The irrigation from an inundation canal being from its nature very precarious, the rates must be low, and consequently the capital cost must be small in order to enable the canal to pay its way.

In the Punjab such irrigation might be usefully attempted wherever there are sufficiently wide belts of khadir land with good soil to render the construction of inundation canals remunerative.

The following is a brief statement of some of the tracts in the Punjab which might thus be irrigated :—

1. The strip of khadir land lying on the right bank of the Sutlej between the upper and lower series of Sutlej inundation canals. It has been estimated that 1,40,000 acres could be watered from the Sutlej river in this way. The Government of India has directed that these works, if ever carried out, should be so aligned as to render it possible to incorporate them as part of the permanent scheme of canals on the Sutlej which was submitted in 1873.
2. An inundation canal from the Ravi below Tolumba for the irrigation of the lands between that place and Mooltan. It has been estimated to water 90,000 acres.
3. A canal from the Ravi to water the station of Montgomery and surrounding country, say some 15,000 or 20,000 acres.
4. An inundation canal from Chiniot-on-the-Chenab, for the irrigation of the Khadir. It is designed to irrigate 23,900 acres.
5. An inundation canal from Ramnagar-on-the-Chenab for the irrigation of 133,680 acres.
6. Further inundation canals could be made with advantage in the Jech Doab, between the rivers Chenab

PUNJAB.

and Jhelum, but no detailed investigation has been made.

There is always a risk of the river cutting away, deserting, or silting up the heads of inundation canals, but under favourable circumstances the kharif crop can be assured by their means alone. As regards the rabi crop, the ground can be prepared for sowing; but, with the exception of gram, all rabi crops require to be subsequently watered from wells. In the Punjab, the inundation canals are usually dry from October to May.

The last question is not completely understood. If it refers to the kharif crops, it may be broadly said that the canal is not, as a rule, supplemented by wells at all. The rivers from which these canals are supplied always rise; if this rise is large the irrigation is large; if small, the irrigation is proportionately less; but so far as actual experience goes it appears that, as a rule, the cultivators never attempt to supplement it in any way; in fact, the Persian wheels are usually dismantled during this season, only to be set up again in time for the rabi waterings.

If the question, however, refers to the rabi, the reply must be that as a broad general rule the rabi crops (with the exception of gram) must be brought to maturity by the aid of well water.

It is, perhaps, desirable to note here that, at the close of the inundation season, the water generally stands much higher in the wells than at its commencement, and that this alone is a great help to the cultivators, inasmuch as the water has to be raised through a less height. It may also be well to note that very frequently the cultivators sow more rabi land than they are able to perfect by means of well irrigation alone. They know they can secure a certain area under each well, and they trust to a seasonable fall of rain for the balance; it is a matter of pure speculation, but from the prevalence of the practice referred to it would appear to be, on the whole, a paying one.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Board of Revenue.—Inundation canals have not come under the observation of the Board. Irrigation from an inundation canal would, the Board, however, consider, be most useful to kharif crops. They understand that, in the Panjáb, inundation canals are made use of for the irrigation of low lands (khadir) bordering on rivers. When the rivers are in flood, the autumn crop is watered from cuts made from the river inland for a certain distance and then carried in a direction to the fall of the country or the course of the river. In the cold season, when the river is low, the canals run dry; and the spring crop derives no benefit from them (*see* Roorkee Treatise on Civil Engineering, Volume II., p. 309). It is clear, therefore, that irrigation from such canals would be useless for rabi cultivation. In ordinary dry seasons (the commission speak of *the*, not *a*, dry season) the extent to which wells can be depended on to supplement the deficiencies of supply in such canals depends entirely on the extent to which well-irrigation is provided. In an exceptionally dry season, wells, especially where the water is supplied by infiltration (percolation), might themselves run dry.

Colonel Brownlow.—An inundation canal, giving water during the rainy season only, is most useful in comparatively rainless countries traversed by a river, which rises in snowy or rainy mountains, and is subject to periodical and comparatively steady increments of volume. The valleys of the Indus, Chenab, and Sutlej afford examples of most favourable localities for inundation canals. The deltas of the Kavari, Godavari, and Kistna rivers afford another example of localities where water is profitably supplied during the autumn months, for the irrigation of rice. In both cases the irrigation is slovenly to the last degree, but in the former case the great dryness of air and soil, and in the latter the equability of the climate and to some extent diminished rainfall prevent any ill-effects from throwing the water broadcast over the country. Irrigation from channels which remain dry and unused for half the year will always be slovenly. The banks crack from drought and are worn down by cattle during the dry season, and when the water comes down they burst, or are over-topped, in all directions. Such irrigation is only suited to comparatively* rainless localities, or those in which rice can, with impunity, be grown in broad areas. I am personally most strongly opposed to its introduction into the North-Western Provinces, believing that inundation canals would never pay in that part of India, and that the deterioration of soil and climate produced by them would far outweigh any occasional advantage derivable from them. Sugarcane cannot be grown without the command of a supply of water all the year round; indigo, and the better classes of rice, require water in the hot season; indigo from April, and first-class rice† from end of May, while a very moderate rainfall, if fairly well timed, will suffice for the other autumn crops. If the "rabi" crop were started in October over broad areas by artificial irrigation from a Government canal during a year of drought, the cultivators would certainly look to Government to maintain the crop, if necessary, by a second watering in December, and the gravest discontent, followed by almost universal distrust and disuse of the canal, would, I am sure, result from any failure to do this. I do not believe that an inundation canal in the North-Western Provinces would pay its working expenses, although it would do much mischief in six years out of ten. I may quote the miserable failure of the Madras Irrigation Company's inundation canal in the Kurnool and Cuddapah districts of Madras Presidency in support of my views of the unremunerativeness of these works, except in localities peculiarly suited to their construction.

I do not think that wells can be depended on to supplement deficiencies of a canal during drought, as my experience goes to show that men who have started a crop by well irrigation will not afterwards resort to the canal except in time of drought when the wells are, by the hypothesis, supposed to take the place of the canal. Nor could wells be depended on to maintain crops started by a canal except to a very limited extent, unless the country were so thickly covered with them as to render it quite independent of canal irrigation.

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* See marginal note in answer to question 23. I believe that the rainfall in the deltas of the Kavari, Godavari, and Kistna rivers during *the months of June to October* is, as a rule, very light. I remember having been told by the Executive Engineer of the Tanjore district in 1873 that the heaviest floods in the Kavari often found Tanjore under a cloudless sky.

† For the seed-beds from which the rice is afterwards transplanted.

H. IV. Qn.20.

Bengal.

BENGAL.

Colonel Haig.—We have no inundation canal as yet, but one is being made at Sarun, which is intended to throw water from the Gunduk into four of the old flood outlets of that river.

Bombay.

BOMBAY.

Mr. Hughes.—A canal giving water only during the rainy season is useful principally in districts in which the people are familiar with the cultivation of rice. In other districts the short experience we have had would appear to indicate that such a canal will only be extensively useful during years of drought, more especially when failure of the latter rain occurs. If the early rain is sufficiently favourable, the people sow the crop, and there is an inducement to them to prevent its failing by taking canal water if the latter rain fails. If the early rain fails they will not sow. I believe there is a general prejudice against sowing without fall, even where water for irrigation is available.

As an example of the success of canals carrying a soon supply only, in districts where rice cultivation ractised, the Khari river irrigation in Guzerat may cited. Full particulars in regard to these works are given in paras. 59 to 73 of the Revenue Report for 1876–77, Part I. These works irrigate an area of 8,448 acres of rice. 4,737 acres is Government land assessed at, on the average, Rs. 7–4–5 per acre. Of this Rs. 2–0–11 is on the land and Rs. 5–3–6 is on the water. The supply of water seldom lasts beyond the rice season, and the crops grown are almost exclusively rice, followed by wheat or gram.

Colonel Anderson.—Much doubt the utility of a canal giving water only during rainy season. First, the people would not, as a general rule, take the water till it was too late; they would hope always for rain to-morrow. Secondly, water would be of little use on undulating ground, and no one would be at the enormous expense necessary to level his land for the occasional resort to irrigation.

Madras.

MADRAS.

Lieut.-Colonel Mullins.—Nearly all the river irrigation in Madras is effected by what are understood to be inundation canals, and channels, *i.e.*, canals designed to be full only when the rivers are in fresh. Successful irrigation without the aid of storage tanks is possible only when the freshes last through the season of the chief crop. With tanks, and channels arranged according to the circumstances of the river and the character of its freshes, any river can be made to serve irrigation purposes. No canal here has been designed with reference to the minimum supply of a river. Wells might be useful to irrigate seed-beds; they are seldom necessary or used for paddy cultivation except in the country near the coast supplied by rain-fed tanks; for raggy and similar garden crops they are used extensively in many parts of the country.

H. IV. Qn. 21.

QUESTION 21.—CANAL ADMINISTRATION.

What is the system of canal administration? Who is responsible for distributing the water and for collecting the dues? May the functions of the engineer in charge of the works and the technical business of the water-supply, and those of the officer responsible for seeing that the availabble water is distributed equitably to the land that most requires it, and securing water to the extension of irrigation and the realisation of the canal revenues and their due assessment and increase, be best combined, or should they be kept separate? State the reasons for your opinions.

H. IV. Qn.22.

QUESTION 22.

What system actually prevails in your Province, and if you think it susceptible of improvement, say how? Do you think a special canal law necessary to admit of proper administration? And have you such a law, and is it satisfactory?

Punjab.

PUNJAB.

Captain Ottley.—The Irrigation Department in the Punjab is administered by a chief engineer, who is secretary to the local government. He is aided by a personal assistant and by an assistant secretary. Under the chief engineer there are four superintending engineers in charge of circles, and under these again are the executive engineers of divisions and their assistants and subordinates of both the Works and Revenue establishments. In the Punjab, the executive engineers are responsible for the distribution of water and the assessment of the water-rates, whilst the deputy commissioner collects the revenue.

It is considered that all matters connected with the distribution of the water-supply, the assessment of the water-rates, the settlement of disputes between the cultivators, and complaints against the distribution or assessment are best left in the hands of the engineers, the collection being entirely in the hands of the civil officers of the district.

The following extracts from a "Report on Irrigation Works," by Colonel (now General) Strachey, R.E., then (1867) Inspector General of Irrigation Works, will, it is believed, afford the best reply that could be given to the question as to whether the construction

Ch. IV. Qn. 21 and Qn. 22.

Punjab.

and maintenance of the works, and the management and distribution of the water-supply, could best be combined in the hands of one set of officers or assigned to two distinct classes of agents.

After remarking that no serious question was in the present day likely to arise regarding the agents who should carry out the construction and maintenance of the works, because, from the nature of the work, it must obviously be performed by professional engineers if it is to be properly performed at all, General Strachey proceeds to the discussion of the question as to whether the management and distribution of the water-supply should or should not be left in the hands of the canal engineers, and says:—

"The positive arguments in favour of a professional management are that, for the economical and certain distribution of water in prescribed proportion to different localities, engineering skill is absolutely needed; that this skill is equally requisite to admit of trustworthy opinions being formed as to the sufficiency of the water-supply, the causes of deficiencies, and the best way of preventing or remedying them; the possibility of extending the use of the available volume of water, and the means of accomplishing this; the manner of dealing with the drainage of the irrigated lands, and utilising to the utmost the surplus water passing from them or the irrigating channels; the decision of disputes among consumers of water as to the shares to which they are equitably entitled, and the quantities they actually received. In fact, it may be said that, among all the steps that have to be taken in relation to the supply of the water and its distribution, there is not a single one which does not call for professional knowledge.

"The properly-qualified canal engineer has this knowledge; the revenue officer is, as a rule, wholly devoid of it, and it may be safely said that no knowledge of the sort in question which he will possess will be of sensible value.

"As a fact, when there is a non-professional management, the whole of the matters above mentioned are entirely neglected, until the evils caused by such neglect become so serious as to lead to an engineer being called in to apply a remedy.

"Nor does this complete what has to be said on the subject. In truth, the full benefit of the engineering skill and knowledge can never be applied to the construction and maintenance of the works unless the engineers are constantly watching their operation, and have an intimate acquaintance with all their peculiarities and the precise wants which they are to supply. Not only is professional knowledge necessary to secure the best management, but a complete practical knowledge of the details of management is necessary to secure the most satisfactory application of professional skill to the works. To know how best to design and construct the works, the engineer must know how they are used; and to know how best to use the work, the managing officers must have engineering knowledge. The conclusion seems unavoidable, that the engineer should have the management of irrigation. * * * I believe that there is one thing only which leads with certainty to success and progress, and that is knowledge; that there is no condition of affairs in which improvements of great value may not be made by the help of increased knowledge; and that, of all places in the world where such improvements may most reasonably be hoped for, India stands very prominently forward. I reject the doctrine that revenue officers, avowedly quite devoid of all the special knowledge which is required for anything but an empirical management of the supply and distribution of water, are proper persons to be left in charge of such a duty one day after it becomes possible to replace them by persons possessed of such knowledge. I dispute the position that, under a reasonable system, professional engineers would be one whit less capable of dealing justly with established rights to water-supply than the district revenue officers, or less careful of the interests of the community and of the public revenue dependent on the efficiency of the irrigation, or less able to command respect and co-operation from the people of the country in which the works lie. On these points we have direct evidence, obtained from actual experience in Upper India, that professional engineers are to be trusted quite as fully as revenue officers; and on general grounds it may safely be predicated of the professional officers that, inasmuch as their exact knowledge of the things to be done will necessarily be more complete, those things will be better and not worse done by them. With no less confidence do I assert that great and valuable improvements may, without the smallest doubt, be made in the irrigation works in all parts of India, and that the scope and necessity for improvement is especially great precisely where the non-professional system of management has till now been followed. As to questions of law, rights, and customs, so far as these really affect the management of irrigation, I can conceive no reason why they should not be as well understood by a specially-trained class of engineers as by the revenue officers."

The Government of the North-Western Provinces, reviewing Colonel Strachey's memorandum, remarked as follows:—

"There is no question in these provinces as to the charge of the works, supply, and distribution being in the hands of the canal officers. The assessment of water-rate, whether by measurement or value, must also, so far as present experience goes, remain with the canal officers. The collection of the water-rate used also to rest in the canal officers, but that has been transferred to the collectors, and, it is generally agreed, with advantage. * * * In its resolution, the Government of India call upon this Government to say whether the engineer may not be relieved of the burden of a great portion of his present administrative duties by the constitution of a separate department. * * * In such a department there would be the assessment of water-rate and of miscellaneous revenue and their collection, police duty, including summary adjudication of disputes, and the preparation of cases for prosecution. No doubt there is here a great array of business, which cannot be dissociated from canal administration, and which yet presses heavily on the canal officer, and must often render difficult the effective discharge of his professional and more special duties. If a separate department, with a staff sufficient to take up the whole of this business in direct subordination to the superintending engineer, were instituted, the Lieutenant Governor admits that it would be a great relief to the canal officer. His Honour does not, however, see the way to recommending such a measure. The expense would be very great; and the Lieutenant Governor is not altogether certain whether a co-ordinate and independent administrative branch might not affect the authority and influence of the canal executive officer."

Experience in the Punjab fully confirms in every particular the reasons set forth in the above extracts for entrusting the engineer in charge of the works with the distribution of the water and the assessment of the water-rate. From the nature of his duties, the canal engineer has the most intimate knowledge of the necessities and capabilities of the various tracts of land in his division, and therefore knows best when to allot the water, and what quantity to give. Again, his special knowledge, together with the records of the allotment, qualifies him to deal with the measurements, assessments, and the various complaints and questions which arise therefrom. It is believed that no other official in the district possesses either the requisite information or has time to take up this class of business; and if special officers were appointed to carry on this work, additional expense and divided responsibility would be involved, and both are to be deprecated. Lastly, the system which at present obtains in this province has had a long and fair trial, and is found to work satisfactorily.

It will be seen from the foregoing remarks that it is not considered that the system at present followed in the Punjab requires alteration.

A special law is undoubtedly required for the proper administration of canals. In the Punjab there is such a law, viz., Act VIII. of 1873. The rules under this Act, having also the force of law, have only lately been sanctioned, so that there has been as yet but little experience of their working. These rules, however, are the out-come of very considerable discussion and criticism, and are, moreover, for the most part based on the results of observation and experience, and there is but little reason to doubt that they will work satisfactorily; so far, at any rate, no serious complaints against them have been brought to light.

Answer to question 21.

Mr. E. O'Brien.—The system of canal administration is as follows:—The canals are managed by the deputy commissioner, a native superintendent of canals, the tahsíldárs, and a committee of the irrigators on each canal. The canals run, in favourable years, from the middle of April to the middle of September. During the running season, the committee of irrigators, and an official called the miráb, regulate the distribution of the water; but every matter has to be referred, through the tahsíldárs, to the superintendent and deputy commissioner.

When the canals have ceased running, the committee of irrigators, tahsíldárs, and superintendent of canals decide what amount of silt clearance, what improvements or repairs, should be executed, and how many labourers will be required for the work. The number of labourers is practically fixed by the superintendent of canals. When the number has been fixed, a petition has to be obtained from the irrigators, asking to be allowed to supply the number of labourers fixed. This is necessary, for the theory is that the canals of this district are managed by the people themselves, and are maintained by labour voluntarily supplied by the people. The number of labourers required is distributed over the area irrigated the year before, and each irrigator is required to supply the number thus assessed. Then a proclamation is issued, the labourers are called out, the annual clearance and repairs begin.

A clerk is appointed to keep the roster of the labourers present and absent, and at the end of the work each irrigator who has not supplied his quota of labourers is debited with the number of labourers which he has not supplied at the rate of 8 annas per man absent per day. These fines on absentees are credited to a fund for the general improvement of the canal.

The members of the committee on each canal are remunerated by being absolved from supplying a portion of their quota of labourers. The tahsíldárs are responsible for collecting the fines on absentees, which are the only canal dues in this district.

I think that the functions of the engineer in charge of the works and the technical business of the water-supply, and those of the officer who distributes the water, secures water to the extension of irrigation, and realises the canal revenues, should be combined in one person. If it is not combined in one person, the persons responsible for each part of the duties can only be:—

1. The engineer in charge of the works.
2. The deputy commissioner who would distribute the water.

I have seen the canal administration here for five-and-a-half years, where the distribution of water is managed by the deputy commissioner. As a matter of fact, he leaves the distribution of water to get on as best it can, and never interferes with it in any way; and, however much he might wish to regulate it, and however active he may be, he could not find time from his other duties to pay any attention to the distribution. The same thing may be said of his subordinate, the tahsíldár. However energetic he may be, he has not the time, and so leaves the distribution of water to take care of itself.

Answer to question 22.

The system of canal administration prevailing in this district (Muzaffargarh) has been described in the answer to the last question. It is capable of improvement by the canals being put under the charge of a professional engineer, who could devote his time to the work, instead of being, as at present, left to such chance attention as a deputy commissioner, already overworked, and without any special knowledge of canals, can give it.

There are 66 canals in this district, with a length of 514 miles. They irrigate 2,09,081 acres, and have Rs. 2,25,706 of land revenue depending on them. A great canal system like this requires the undivided care of a European professional engineer. Under the present arrangement, the supply of water is either deficient or excessive. The powerful irrigators escape supplying their full quota of labour, and take more than their fair share of water. Works are ignorantly executed, and a great deal of labour is wasted. The Northern India Canal and Drainage Act VIII. of 1873 has not been extended to this district. There are no rules of any kind in force. A law is very necessary for it. If a single irrigator refused to supply labour or pay fines for not supplying, there is no legal means of compelling him, and if he contested the deputy commissioner's power in the civil court the whole system of canal management would break down.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Answer to question 21.

Mr. Anderson.—(1.) The officer primarily responsible for the management of a canal division is the executive engineer, or, as the law calls him, the divisional canal officer. He is assisted in the administration of the division by—

(*a.*) Assistant engineer or sub-divisional canal officer.
(*b.*) Deputy magistrate.
(*c.*) Ziladar.

Four or more divisions are formed into a circle, in charge of the superintending engineer or the superintending canal officer; and the entire system is under the chief engineer, who is also secretary to the local government, and under the direct orders of the Lieutenant-Governor administers the department.

(2.) The canal officers are responsible for the distribution of water and the assessments of water-rates. Collections are made by collectors through their tahsildars.

(3.) The collection of water-rates may be left to the collector of the district, but every other duty in connection with the administration of the canals must be undertaken by specially-trained officers.

(4.) Irrigation, like every other important business of life, requires years of training to ensure success. The officer in charge of irrigation works must not only have received a scientific education, but must have good practical knowledge of the profession of an engineer to admit of his maintaining his works in working order, to enable him to distribute his water to the best advantage. Not only is this scientific and professional knowledge requisite, but also a knowledge of the soil and meteorological condition of the country, the tenures under which the land is held, the ordinary practice of agriculture, and, last but not least, the habits and customs of the people.

Great as has been the advance made during the last few years in the economical distribution of water, the field for further advancement is still large. But it is the adept, and not tyro, who will be able to take full advantage thereof.

Answer to question 22.

(1.) The system in vogue in the North-Western Provinces is briefly:

(*a.*) Assessments realised by collectors.

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North-Western Provinces.

(*b*.) All duties relating to management of works and distribution of water performed by canal officers.

(2.) The present system is certainly open to improvement, but the improvement is taking place daily. By compelling every young officer to pass not only the engineer and law examination required at present, but also an examination in land tenures, nature of soils, &c., the improvement would be hastened. But these special tests would need special emoluments. Remunerate the canal officer in proportion to his responsibilities, and the end desired will soon be attained.

(3.) A special canal law is certainly necessary to proper administration.

(4.) Yes; Act VIII. of 1873. It has worked satisfactorily.

Board of Revenue.—The system of canal administration will be explained by the Secretary to Government in the Irrigation Department. The canal executive engineer is primarily responsible for distributing the water; the district (Revenue) officer (the collector or deputy Commissioner of the district) for collecting the dues. The 3rd minor question, inside question 21, is somewhat confused. No one officer is responsible, nor should any one officer be responsible, for (1) seeing that the available water is distributed equitably to the land that most requires it; (2.) securing water to the extension of irrigation; (3.) the realisation of the canal revenues; and (4) their due assessment and increase. The Board are of opinion that the functions to be discharged in connection with canals may best be classified under two heads—

1. Engineering.
2. Revenue.

The first, which will comprise—

(*a*.) Professional charge of the works.

(*b*.) The "technical business of the water supply."

(*c*.) Equitable distribution of the available water.

(*d*.) Securing water to the extension of irrigation, should devolve on the canal executive engineer.

For the second, viz.:

(*e*.) Realisation of the canal revenue (excluding all canal dues other than owners' rate and occupiers' rate).

(*f*.) Assessment of owners' rate and occupiers' rate, the collector of the district should be responsible. What is meant by an "officer being responsible for increase of canal revenues?" The Board do not understand. All the functions noted above (taken from the Commission's question) could not be combined in one officer, *e.g.*, the officer responsible for the realisation of the canal revenues and their due assessment could hardly be placed in charge of the works and be entrusted with the "technical business of the water-supply." Nor would it be advisable to make over the duty of the realisation of the canal revenues (*i.e.*, owners' rate and occupiers' rate) to the engineer in charge of the works, &c., a duty which could be more easily discharged by the officer responsible for the collection of the land revenue, for which an establishment is maintained under his orders.

Question 22 has been partly replied to in answer 21. So long as the (i.) engineering, and (ii.) revenue functions, are kept distinct, and discharged—the first by the canal executive engineer, and the second by the collector of the district, the system is sufficiently satisfactory. No special canal law is "necessary to admit of proper administration," which may best be regulated by the local government under the North-Western Provinces Canal and Drainage Act.

Col. Brownlow.—In the North-Western Provinces and the Punjab the canal officers maintain the works, distribute the water, and assess the irrigation revenue; the district officers collect the revenue on the canal officer's warrants. I am strongly in favour of the maintenance of the present system of canal administration in these provinces. I hold that in designing a canal the revenue authorities of the tract commanded by the proposed work should be unreservedly and fully consulted as to the wise and equitable distribution of the available volume, and that their wishes should, as far as is possible, be exactly complied with. But once the distributaries have been dug and the canal is in full operation, any further changes in distribution ought to be most cautiously undertaken, deprivation of canal irrigation involving most serious results to the agricultural community dependent on it. No canal officer, either in the North-Western Provinces or the Punjab, has the power to effect such a change without the fullest sanction of the Government in Revenue Department. In like manner no increase can be effected in water-rates without the sanction of the local government and the Government of India. The realisation of the canal revenue is already in the hands of the civil officers, so that the concluding question of the paragraph under reply resolves itself into one regarding advisability of transferring the assessment of canal revenue from the hands of the canal into those of the revenue officers. To this question I unhesitatingly answer in the negative. The only reason that I have heard put forward in support of the proposal is the supposed economy that will be effected by the measurement of canal-irrigated areas by the district revenue establishment. But the district revenue establishment has its hands already over-full of work (I presume that no reasonable man wants the village patwari to do more than is already expected of him), and the canal revenue establishment is equally overworked; so that the suggested economy is quite visionary, and the proposed transfer will only result in an increase to the district revenue establishment equivalent to, or exceeding, the present canal revenue establishment. As regards the supervision and control of the canal measurements and assessments, believing that district officers have already as much to do as they can possibly perform, I fail to see how proper supervision can be secured without the appointment of a special additional civil establishment for the purpose. And in this connection, I hope I may be permitted to quote an analogous case, which may illustrate the economy likely to result from the proposed arrangement. On the Eastern Jumna Canal the collections of canal revenue were formerly effected by the canal establishment, and their cost was never in excess of 1 per cent. of amount collected. The collections were transferred to district officers on the plea that the payment of even 1 per cent was useless expenditure; it was just as easy for the tahsildar to collect the water-rate while collecting the land revenue as to collect the latter alone. *The collection of canal revenue now costs more than 5 per cent. of amount collected.* So much for the economy of the scheme. Now to consider its efficiency. I presume that no one will question the advantage of promptness in assessment of demand and in record of results of a season's work. We have now, I venture to assert, attained to very commendable promptness in assessment and record in the North-Western Provinces and Punjab, where the responsibility for the performance of these duties rests with canal officers. The interminable delays and difficulties in arriving at any accurate knowledge of the results of working a Government irrigation canal in Madras, where the assessment and realisation of canal revenue lie with district officers, are too well known to require much setting forth. However I give below* the last

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* *Extract paragraph* 9 *of letter No.* 2418, *dated* 21*st October* 1877, *from Acting Collector, Cuddapah, to Secretary, Board of Revenue, Madras*:—

"At present it appears to be pretty near a hopeless task to expect punctuality and promptness in the submission to collector of the revenue accounts connected with canal irrigation. The whole machinery of this department has been disorganised by the famine, the intelligent men of all divisional and 'taluq' establishments are absent upon other duty, and their places are in general supplied with anything but efficient substitutes. Added to this, the famine has given rise to the necessity for preparation of numerous extra accounts and returns, and the 'reddies' and 'curnams' are being constantly hurried by the work and inspections called for by the administration of village relief."

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North-Western Provinces.

wail that I have heard on the subject; and to my mind it illustrates very forcibly the objections to throwing on the collector and his establishment the management of everything connected with the district, instead of leaving special work to be managed by specially-trained establishments.

But, oblivious of the argument from economy, an opponent may urge that it is never intended to throw all this extra work on the existing revenue establishments. We shall then have two parallel establishments working side by side, one for the maintenance of the canal works and the "technical business of water-supply," the other charged with the distribution and extension of irrigation and with assessment and collection of canal revenue, and, in order to bring the double establishment within reasonable limits of cost, the executive and administrative charges will probably be doubled in extent. Now, in doing this, we shall at once weaken and relax the close personal supervision which is the great secret of successful management of canals, or indeed anything else, in India or elsewhere. A canal executive or assistant engineer has now a charge of reasonable extent, and while looking after the maintenance of the works in that charge has time to look thoroughly into the management and distribution of water-supply and assessment of irrigation, all of which are closely connected with and immediately contiguous to his works. With a charge doubled in extent, very much of the time now given to inspection will be necessarily lost in moving to and from distant points of the charge. Again, the most economically managed canal is that on which the expenditure on maintenance of works and clearance of channels is best proportioned to the results attained. Separate the responsibility for maintenance from that for distribution and control of water, and you will at once increase the expenditure on maintenance. A canal officer can now often reduce expenditure on clearance of distributaries by a little skilful management of the water-supply, but if he feels that this latter business is in the hands of another man he will, to save himself from any chance of recrimination, spare no expense in keeping his distributaries perfectly cleared at all times. And the *personnel* of the canal revenue establishment would certainly deteriorate if it were transferred to the control of the Civil Department. Under the present system the distribution of the water and measurement and assessment of irrigated areas are closely watched by public works officers, who are well paid, and have good prospects of rising in the department if they do their duty efficiently. We thus get fresh energetic men with every incentive to work well. A mistaken selection can be at once remedied by transfer to another and more suitable branch of the Public Works Department. Under a system of management by civil officers, we should not be able to afford more than one or two covenanted civilians for general direction and control, and all the practical management of distribution and irrigation, now thoroughly looked after by active young assistants looking for promotion to higher charges, would fall into the hands of deputy revenue superintendents, with less pay and incomparably inferior prospects of promotion. We could not afford to pay such men more than about Rs. 500 a month as maximum salary, and, as the irrigation work is of a very special nature, it would be difficult to draft off bad selections and provide for men too old or infirm for the active out-door work essentially necessary for the proper discharge of the duties of the office.

Answer to question 22.

I think that the working of Irrigation Department in the North-Western Provinces and Punjab, under Act VIII. of 1873, and the rules issued under that Act, is satisfactory.

Bengal.

BENGAL.

Colonel Haig.—We have two systems of canal administration in operation—one in Orissa and Midnapore, the other on the Sone canals. In the former the distribution of the water alone is in the hands of the engineers, the issue of leases, permits, measurements of areas, and collection of water-rates being managed by a special revenue establishment under the control of the collector. On the Sone canals the distribution and all revenue matters are managed by the engineers, the collections alone being made by the collector on demand-statements furnished to him by the executive engineer.

Which of the two systems is the best it is not possible as yet to say, that on the Sone canals having only been introduced last year. The Orissa and Midnapore system has been in operation for several years, and has worked very satisfactorily. Personally, I am rather inclined to give it the preference, as likely to be the cheapest of the two, and to promote the extension of irrigation (in which the special revenue establishment is just as directly interested as the engineer) as much as the other, without the disadvantage of taking up the time of the engineers with a mass of petty revenue work which can as well be done by natives under the control of a revenue officer. A few years, however, must elapse before the Sone system, which is the same as that of the North-Western Provinces and Punjab, can be properly tested. It certainly has the merit of inspiring the engineer establishment with a certain enthusiasm for irrigation, and a deeper interest in, and more intimate acquaintance with, the native agricultural population and their methods of cultivation. But it may be a question whether the time thus devoted to agricultural and revenue questions might not with more advantage be employed in more strictly professional duties.

Bombay.

BOMBAY.

Answer to question 21.

Mr. Hughes.—1. The system of canal administration is described in paragraph 27 of the Revenue Report for 1876–77.

2. The canal officer is responsible for distributing the water, and the collector collects the dues on statements framed by the canal officer; *vide* Canal Return IV. of accompanying Canal Rules.

3. No change in the present system is, in my opinion, desirable, and my reason for saying so is that it has been found to answer very well. There is generally a very good understanding between the officers of the two departments, and complaints in regard to the management of the works are very rare indeed.

Answer to question 22.

1. See rules appended. 2, 3. A special canal law is, in my opinion, necessary for proper canal administration. It would legalise the present canal rules, and would clearly define the powers of the canal officer and give him powers which at present he does not possess. This is specially important in regard to the construction of distributing channels, in regard to which there are frequently difficulties. For instance, A is desirous of taking water which B is not, but the channel from the canal or main distributary to reach A's land must pass through B's and B refuses to allow it, and at present Government or the canal officer is powerless to interfere.

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Bombay.

At present no law exists for punishment for waste of water, for the surreptitious use of water, or for enforcing the minor distributing channels being kept in repair. Nor are there powers for assessing indirect irrigation. The Canal Bill which has been proposed will meet all these difficulties.

Answer to question 21.

Mr. Propert.—Canals are in charge of the Irrigation Department, and are administered according to the Canal Rules of 1876 (Bombay Presidency). These should be consulted. Water is distributed by the irrigation officers, and the dues are collected by the Revenue Department. It has been found, with the assistance of subordinates, quite possible and convenient to combine the functions of the engineer in charge of the works, and the technical business of the water supply, with the duties of water distribution and canal revenue assessment, and as a matter of fact the Executive Engineer for Irrigation does without difficulty perform all the above duties. The realisation of the canal revenue, however, is undertaken by the Revenue Department. The arrangement is, I consider, equitable, inasmuch as the latter department has special facilities for the collection of all kinds of revenue, which the Irrigation Department certainly has not.

Answer to question 22.

The canal administration is carried on in the Bombay Presidency by means of a code of departmental rules. There is no special law on the subject. As far as I am aware, the rules work well, and I know of no actual necessity for a special law.

MADRAS.

Madras.

Mr. Sullivan.—In all large irrigation works, such as the Godavari, Kistna, and Cauvery systems, the rule is for the main supply of water to be under the control of the officers of the Public Works Department. To quote from a note by the Chief Engineer for Irrigation, printed with proceedings of the Madras Government in that department, dated 5th March 1873, No. 713: " The duty of the Public Works officer is, or should " be, confined really to regulation, which includes, of " course, distribution in bulk, if I may so term it, but " not distribution in detail. The regulation of the " water-supply in the Kistna, the Godavari, and in " all systems of irrigation in which any such regula- " tion at all is practicable, should, down to the sluices " which supply the lands of one village only, be " vested in the Public Works officers. It appears " essential that such should be the case so far, because " an independent authority is required to manage the " supply until it passes into the hands of the village " community. If a channel supply two villages, it " would not do to let each village manage the sluice " at the head of its channel, otherwise the other " village might and probably would suffer." The Government, in passing orders on the subject in the proceedings above quoted, directed that " instructions " be issued in the Revenue and Public Works Depart- " ments absolutely restricting the functions of the " subordinate officers of the latter department to the " regulation of the water-supply in channels which " supply the lands of more than one village, and " vesting in the village officers the charge of the " water supplied to single villages from the moment " it quits the regulating sluice, over which, however, " they will have no control." The Board of Revenue were directed to report after consulting with collectors from what date the arrangement could take effect, and the reference elicited the fact that, with a few unimportant exceptions, the system was already in force throughout the Presidency, and was found to work satisfactorily. Under these circumstances, no special legislation seems to be called for in connection with canal administration so far as irrigation is concerned. The objections to making the Public Works officers in charge of irrigation canals responsible for the collections of the additional revenue derived therefrom, the extension of the irrigated area, and the equitable distribution of water, are twofold. In the first place, owing to the paucity of engineers, it is with difficulty that they can cope with their own legitimate work, and, if fiscal duties of the nature indicated are imposed upon them in addition, the burden will be greater than they can bear. These great systems of irrigation, where the flow of mighty rivers is suddenly arrested in view to their being made to pay a fertilising tribute to the thirsty land before they are allowed to resume their natural course towards the ocean, form a very anxious charge, and tax the best energies of the specially-trained body of men to whose care they are entrusted. Then why assign to them a task alien to their profession, for the performance of which another agency exists? Secondly,—even supposing the engineers had time to devote to such matters, the practice would be objectionable on the ground that considerable friction between them and the officers charged with the collection of land revenue would be inevitable. At present this and the revenue derived from irrigation are both collected by one agency—an agency with which the ryots have been accustomed to deal from time immemorial, and which has at its sole disposal the organised service of the villages. But, if the engineer is to collect the water-rate and the tahsildar the land-revenue, the village officials would be at the beck and call of two masters whose joint requirements it would be impossible for them to satisfy, and general confusion would be the result. It would be utterly impracticable to work such an arrangement.

Lieut.-Colonel Mullins.—*Canal Administration.*—In Madras, as regards the larger modern works, the canal officers are responsible for the distribution of the water. In the Tanjore delta the distribution by canal or public works officers is limited to the equitable division of the supply between the several rivers which there take the place of canals. Public works officers have generally nothing to do with the distribution of water from tanks, which is managed by the people cultivating under the tanks. The dues or revenue is assessed and collected by the revenue officers, and only in a few instances and not as the rule are canal officers consulted as to the remissions to be granted for alleged failure or excess of water. Were the revenue work in connection with canal irrigation thoroughly done by those officers there would be no advantage in making any change in the present system, and it would be in every way better that it should be so thoroughly done by those officers than that the duty should be transferred to the canal officers, who have more than sufficient work to do of a kind which can be done by them alone. That there was revenue work to be done which has been left undone is evident from the fact that any definite information as to the extent and revenue of the irrigation under even the most important systems, such as the deltas, was not forthcoming until a few years back, the earliest statement for the Godavari and Kistna being for the year 1871–72 (Fasli 1281), while for the Cauvery delta, the Penner anicut, and the rest of the systems for which capital and revenue accounts are to be maintained, no statement of the particulars of irrigation has yet been prepared. The statements for the first-named deltas were also very imperfectly prepared, and comparison of the details for successive years led to the discovery of many discrepancies, and to corrections and explanations, which latter, being in many cases essential to the understanding of the statements, should have from the first been recorded thereon.

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Madras.

The Proceedings of Government noted below * indicate how much remained to be done before the work of the revenue officers could be deemed to have attained to a reasonable standard of sufficiency.

It is impossible, of course, for any public works officer at any rate to say what revenue has been lost, because no data for an examination are on record, but it must be assumed that for effective check the superior revenue officers must know what areas are under irrigation, where they are situated, and from what canals supplied, and they have not in any case until recently had such information, and have not got it generally even now.

The canals supplied water, and the people were very willing to take it, and so as regards the Godavari and Kistna deltas the works were as irrigation works and financially successful. Had the conditions been otherwise, as in the case of the Madras Irrigation and Canal Company's canal from Kurnool to Cuddapah, the results which have, in a great measure, there followed from inefficient revenue administration would have most prejudicially affected the financial prospects of the delta systems.

In the Cauvery delta, in the absence of a revenue survey or anything more accurate than the rude measurements of the village accountants, which measurements, moreover, were in many cases taken originally from starting points which have long since ceased to be capable of identification, really efficient revenue administration is out of the question. It may be that the Government get a proper revenue from the irrigated lands or their revenue may be little or much less than it should be, but under existing circumstances definite and accurate information on these important matters is unattainable and adequate supervision and control are impossible. Encroachments here and elsewhere are common, and so little is their injurious effect appreciated even where river embankments and channel banks have been scarped to extend the area of the fields, that these encroachments, when most apparent and confirmed by the fields being in excess of the registered areas, are deemed the property of the ryots, and if it be found, as is sometimes the case, essential to recover such land in order to provide for the safety of the banks, such land has to be purchased, and often at a very high price.

Legislation.—There is a great want of discipline generally in the management of irrigation works. Canal and public works officers have never been furnished with any powers for the enforcement of good order and the prevention of improper interference with the distribution of water. The definition of mischief in the penal code does not admit of the most mischievous and prejudicial acts being dealt with criminally, and there is no special law to remedy this defect. The enforcement of discipline by civil suit is, of course, impracticable, and Government would be often unable to prove for damages in such suits, as it might be held that the ryots rather than the Government were the sufferers by the wrongful acts.

A law providing for the prompt repression of all wrongdoing in connection with works of irrigation is much required, and canal officers in those cases in which the detailed management of the irrigation is in their hands should be adequately empowered to enforce the law and the rules and regulations made under it.

It is a notable instance of the mistake which has been made in leaving public works officers in charge of irrigation works without power to enforce rules, that in 1856-57, when the responsibility for the maintenance of irrigation works generally throughout the Presidency was transferred from the Revenue to the Public Works Department, no provision was made for the enforcement of kudimaramut, *i.e.*, of the obligation of the holders of irrigated lands to execute petty repairs to the irrigation works on which such lands are dependent for their supply of water. The Revenue officers ceased to attend to the matter, and the public works officers could do nothing beyond for a time refusing to do what the villagers ought to have done. The works suffered, and ultimately, when taken up for repair, the deterioration due to the neglect of the kudimaramut obligation had to be included in the estimates. The absence of efficient arrangement, which must, it is considered, be attributed principally to an idea which prevails in this Presidency that no public works officer is fit to be entrusted with any legal powers, has cost the State a great deal of money, and the neglect of kudimaramut has been at least as injurious to the people as to the State.

Major P. Montgomerie, R.E.—Irrigation Administration.—(1.) In the Madras Presidency, where the irrigation works are numerous and scattered over large tracts of country, their successful conservancy and further development must, in a very great measure, depend upon the system of irrigation administration, and it is absolutely necessary that whatever system is in force it must be administered by one head, whether consisting of a single individual or a collective body. The failure of the present dual arrangement in force in Madras is evidenced by the almost dead-lock * which occurs in furnishing statistics of revenue, &c. on which to base financial measures and engineering proposals, and by the neglect to utilise during the first stages of the late famine the existing organisation of the Engineer Department (such as it was) on the irrigation works of the country.

(2.) The impossibility (at least in the Madras Presidency) of combining in one individual the functions belonging to the collector of the revenue and the conservancy engineer makes the unity of the governing body all the more necessary.

(3.) The Board of Revenue (if it is to continue an institution of the land) should, as its name implies, be held responsible for the irrigation administration of the Presidency; but it must be reconstituted with a due proportion of the professional element. Whatever other changes may be considered advisable in the constitution of the Revenue Board, the addition to it of the Chief Engineer for Irrigation as a member, and his assistant as one of the secretaries, is necessary, and would cause little or no extra expense to the State.

(4.) The Revenue Board having been reinstated as the responsible head of the irrigation administration, it would be necessary to define the limits of the executive charges. These should be conterminous with the jurisdiction of collectors except in the deltaic districts, where the existing arrangements of divisions might remain, or be even somewhat strengthened. The areas of a few of the present districts, such as Bellary, Madura, Salem, &c., are probably too extensive for a single executive charge; but as they are also admitted to be too extensive for the charge of a collector, the natural suggestion to make is, that these districts should be re-arranged.

(5.) The executive engineer in charge of a district should be considered purely a conservancy engineer, to keep in thorough order all existing irrigation works including the construction of the necessary escapes and other masonry works connected with them; and he should not be required to investigate elaborate schemes of irrigation, although it would be his duty to suggest all necessary extensions and improvements, the cost of which would be beyond the local power of sanction. The local power of sanction should be fixed at a sum not less than Rupees 2,500 for original works, and for repairs any amount within the limits of the grant made to the district. The system of kudimaramut or customary labour must be revived, and an act to faci-

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* Proceedings of Madras Government, No. 2085, dated 22nd July 1875.

* *Vide* Secretary of State's Despatches, No. 22, dated 20th December 1877, and No. 19, dated 26th September 1878, referred to in Proceedings of the Madras Government, Public Works Department, No. 993-I., dated 5th December 1878, and Government of India's Letter, No. 622, dated 7th October 1878.

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litate the conservancy of rivers and channels should be passed, and the conservancy engineer, at least in the more important irrigation districts, must be entrusted with magisterial powers to enable him to enforce the conditions of the law. By this arrangement he would be more intimately associated with the collector of the district, and would hold a recognised position in its administration.

(6.) The investigation of all projects likely to cost more than the amounts within the local power of sanction should be conducted by an entirely separate staff of engineers and assistants, &c., whose salaries would be debited to the projects on which they are employed; and until matured projects are well in advance of the labour available for carrying them out without the enhancement of rates, this extra staff should be strong in numbers. Besides the investigation of new projects, this extra staff would be employed in grouping and estimating for the repair of the ordinary irrigation works of those districts which are most behindhand; the execution of the repairs being carried out, as already explained, by the local conservancy engineer, and any extensive new work by a special man, either directly under the conservancy engineer or independently, as may be most convenient.

(7.) Executive engineers of the special staff would be eligible for employment, as district engineers, and *vice versâ*. But executive engineers in charge of districts and divisions or special works will alone be in account with the examiner of public works accounts.

(8.) To ensure discipline in the districts and the intelligent investigation of projects there must also be superintending engineers. These officers should be responsible for the sanctioning of local estimates, and be the medium of communication between the executive engineers and the Board.

(9.) To sum up, the foregoing proposals may be stated to be briefly as follows:—

1st.—The more intimate association of the Revenue and public works officials, without which the interests both of the Government and the ryot must suffer.

2nd.—The placing under one responsible head the irrigation administration of the Presidency, by which the Chief Engineer for Irrigation will be in a position to collect and furnish all necessary statistics without in any way being relieved of the responsibility which must always attach to the chief adviser to Government in irrigation matters.

3rd.—The entire separation of the duties of the conservancy engineer from that of the investigation of projects, by the provision of a special staff for the investigation of projects, and to assist in grouping and estimating for the repairs of existing irrigation works in those districts which may be behindhand.

4th.—The revival of the system of kudimaramut, and the passing of a law to facilitate the conservancy of rivers and channels and empowering the conservancy engineer to carry out the conditions of the law.

(10.) All these proposals might be carried out without any increase to the cost of the existing department, and with hardly any alteration in the present location of the district officers; and if it be decided to make the cost of the special irrigation staff a permanent charge against the department, a very efficient staff could be provided from the Rupees 1,15,152, the amount by which the cost of the Public Works Establishment has lately been reduced in accordance with Proceedings, Madras Government, Public Works Department, No. 3,674–W., dated 18th September 1878.

Question 23.—Slow Extension of use of Canal Water.

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Why has the extension of the use of canal-water been commonly so slow? What has been the nature of the obstacles, and how can they best be avoided or removed? Have any of your canals practically reached the state in which any further extension is not likely, or is likely to be small? Say how far this is the case in each? Are difficulties met with in preparing land for irrigation for the first time in the way of subdividing fields, or levelling the surface, or formation of water-courses which require more time and money than can be supplied by a limited population otherwise than slowly? If such difficulties are met with, how may they best be removed? Does the existing system provide sufficiently for making advances to cultivators to adapt their land to irrigation, and if not, what changes are desirable? Does not shortness of supply during the hot season materially affect progress of canal irrigation?

PUNJAB.

Punjab.

Captain Ottley.—It may be confidently stated that, as a broad general rule, the extension of irrigation in all parts of the Punjab has been the reverse of slow. The people ordinarily apply eagerly for the use of canal-water as soon as a supply is available and they are satisfied that it is constant. An instance of the necessity for permanency occurred on the new rajbuhas constructed from the Katora Canal, which is one of the Upper Sutlej Inundation series. When these rajbuhas were first constructed there was a rush of applicants for water, but during the first season the supply of this canal failed owing to a change in the course of the river and the consequent silting up of the head.

This unfortunate occurrence deterred the cultivators from going to the expense of making proper water-courses, and canal irrigation fell for the time into disrepute. It was found possible, however, the next year, to secure a better head for the canal, and the constant supply which was thus maintained dissipated the fears which the cultivators had entertained, and they commenced on all hands to complete their channels and used the water, and the latest reports exhibit a very remarkable extension of irrigation on these lines.

On the Bari Dohab Canal the extension of irrigation, quick as it was, would have been still quicker had there been funds enough at first to enable the distributaries to be completed at the same time as the canal. Unfortunately this was not the case, and the demand for water was invariably ahead of the power of supplying it.

To ensure a rapid extension of irrigation in the Punjab, on the opening of a canal all that appears necessary is to provide (1) an absolutely certain supply of water, and (2) a proper system of distributaries (completed in all respects at the time the water is admitted) to convey the water within easy reach of the cultivators; and the reason of this may be stated to be that every second or third year there is ordinarily a failure of seasonable rain-fall during one or other of the crops.

On the Western Jumna Canal, no very great extension of irrigation is to be expected so long as the present supply at the head is maintained. It is hoped that the remodelling of part of the main line, which is now in progress, as well as the construction of proper distributaries and the introduction of pipe outlets in place of the large openings formerly granted, will prevent the present lavish use of water and thus render a certain extension of irrigation possible, but no estimate of what that extension will really be can be made. If, however, this canal is ever enlarged, as has been proposed, to the extent of carrying an *additional* supply of 2,000 cubic feet per second during the kharif season, there would, of course, result a very large extension of irrigation.

The Bari Doab Canal is open throughout the entire length proposed under the latest estimate. There will certainly be an extension of irrigation, but this will principally result from the tract of country traversed by the Kasur and Sobraon branches, into which water has only lately been admitted in small quantities, and the distributaries from which are not yet completed on their entire length.

On these rajbuhas it has been reported that the main difficulty encountered in the development of irrigation has been the poverty of the cultivators, which, it is alleged, has prevented the more rapid construction of the water-courses, which must now, according to the latest rules, be completed before the admission of water is permitted.

As soon as this was brought to the notice of the local government, the canal officers were desired to instruct the cultivators that, on proper representation being made to the district authorities, no obstacle would be thrown in the way of their obtaining "takávi" advances. This appears to have solved the difficulty raised, and nothing further appears to be required.

As regards the question of shortness of supply during the hot season, it may be sufficient to state that this difficulty is practically unknown in the permanent canals of the Punjab, as the rivers from which their supplies are drawn are fed from the snows, and are not dependent on rain-fall.

The inundation canals, although fed from the same, or similar, rivers as the permanent canals, are subjected occasionally to short supply. This is due sometimes to an insufficient rise in the river, but more frequently to some change in its course, which, by interposing a sand-bank between it and the canal head, prevents a proper supply passing down the channel.

Mr. O'Brien.—The cause of the slow increase of canal irrigation has been inefficient administration. No other reason can be alleged why the cultivation in the canal tracts has not increased *pari passu* with the rest of the district. The cost of irrigation, Rs. 0-10-6 per acre, is very low. The soil of this district produces superior crops. Little labour is required to bring waste land under cultivation. The canals may be all said to be in an unsatisfactory condition, inasmuch as the defects in the administration have not been removed. During the 16 years that preceded 1875 the canals were absolutely neglected. Attention has recently been called to them, and some improvements have been made of a temporary nature. No canals have reached the state in which further extension is not likely. There are 15,35,475 acres of culturable waste in this district, to which canal irrigation could be extended. The district is very favourable for the extension of canals. The hot-weather level of the Indus is higher than the greater part of the district, and there is a steady slope from the Indus to the Chenab, and no dorsal ridge between the rivers. The difficulties in preparing land for irrigation for the first time are small. There is not a rock in the district.

Mr. J. B. Lyall.—The extension of the use of canal water is not slow in the case of these inundation canals in the south of the Punjab. It has been slower than it ought to have been in certain places, but this has been because the supply of water has been scanty, owing to mismanagement of the repairs and clearances of particular canals. Such slow extension has not been caused by reluctance to take water or by difficulties in preparing the land for irrigation.

Major Grey.—I have not found the extension of the use of inundation canal water slow. In 1875 the incomplete Ferozepore canals irrigated 43,330 acres. In 1876, when still incomplete, they irrigated 64,675 acres. What they have done since I completed them and left, I do not know; but I know that the only delay in the development of the irrigation was that unavoidably incurred in the construction of distributaries. The same applies to new works in the Baháwulpur State, but it is to be borne in mind that the water is taken free of charge in both instances.

There is a certain difficulty and delay in the construction of distributaries. Unless professionally aligned, zamindars are, after experience of failures, very shy of attempting large distributaries; and, without large distributaries, the cultivation of a canal is limited to a narrow marginal strip, such as can be reached by the irrigation cuts taken from the canal direct. Again, such distributaries require money for their construction, and the existing system does not provide adequately for the supply of money. Takávi will never be freely taken while the grants are hampered with the present conditions.

Accidents of season do not affect the progress of inundation canal irrigation. The zamindars expect such. Without such accident there is no shortness of supply in the hot season.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES.

Board of Revenue.—The Board have no reason to suppose that the extension of the use of canal water has been so slow in these provinces as to call for inquiry and explanation. The Commission appear to have had the canal works in Orissa and Madras in view. The Board are not aware of the progress of canal irrigation being retarded by difficulties in the way of preparing land for irrigation, &c. No applications for funds for the adaptation of land to irrigation have ever been made to the Board, nor does it appear that any advances are needed for the purpose. Wherever canal irrigation is required it is readily accepted. Where the canal passes through a tract which does not require canal irrigation (as is sometimes the case) canal water is not taken at first. When kucha wells fall in, or the cost of canal-irrigation is discovered to be less than watering land from a well, the canal will be resorted to.

Mr. C. C. Anderson.—(1.) Owing to the conservatism of the people, where irrigation has been in practice extension or introduction is not slow.

(2.) Doubt if the obstacles can be removed as long as the people remain in their present condition of semi-civilisation.

(3.) Not in the North-Western Provinces. The cry in the North-Western Provinces is the want of water, not the superabundance of it.

(5.) Most of the canals in the North-Western Provinces are not capable of extension of main channels, though there is possibly great room for extension of irrigation. This will be effected by minor channels, a greater economy in consumption resulting from better management.

(6.) Can give no reliable reply to this, as data are wanting to determine the quantity of extension.

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North-Western Provinces.

(7.) Do not know of any such difficulties.

(9.) Yes.

(10.) Most decidedly, as far as kharif crops are concerned.

Colonel Brownlow.—I do not think that the extension of canal irrigation has been slow in Upper India. In Orissa, I am inclined to believe, from what I have heard, that irrigation has been surreptitiously practised to a much greater extent than the records of the department show. In saying this I have no wish to impute blame to any one. I think that, owing to the character of the climate and configuration of the ground, great difficulties attended the introduction of irrigation in Orissa; that the system of revenue management and of distribution has not been the best that might have been adopted; and that failure has been rendered more conspicuous by the unreasonable promises of results held forth by the designers of the works.* The failure of the Madras Irrigation Company's canal is primarily due to the intermittent supply, the canal being dry for five or six months of each year; secondarily, to high rates and to the character of the country traversed by the canal, which is very well suited to growth of cotton and "jowari," which do not generally require irrigation. In the North-Western Provinces and Oudh, the Sardah Canal and the canals from the Betwa and Keyn are the only ones that occur to me as likely in any way to repay cost of construction. In the Punjab there is plenty of water, but the want of population would bar all prospect of early returns from any large canal west of Lahore.

In Bengal, there is, as a rule, too much water, and the ordinarily abundant rainfall will necessarily make returns from large irrigation works more or less uncertain and slow in coming in.

In Madras, the completion of the irrigation works in the Kistna and Godavari deltas ought to be carried out, in my opinion. The soundness of the only other extension schemes in that Presidency that I have seen seemed to me most doubtful. I may mention amongst these the Sungum project for extension of irrigation from the Pennair river; that for a canal from the Tungabhadhra river to irrigate the Bellary district; a proposal for a canal of irrigation from Cuddapah to Nellore; and another for increasing the capacity of the Red Hills and Sholaveram tanks in connection with water-supply of the town of Madras.

There are a number of schemes in contemplation for irrigation from rivers and reservoirs in the Bombay Presidency, but each would have to be dealt with on its own merits, with especial reference to cost of construction, supply of water available, and area and physical character of the country commanded. Difficulties in the way of preparing land for irrigation must be taken into consideration in estimating progress of income from all schemes which command hilly or undulating ground. Such difficulties have undoubtedly checked the progress of many irrigation works in Bombay, and I have been told that they similarly affect the Madras Irrigation and Canal Company's canal in Madras. The Bombay irrigation schemes are, as a rule, either so absolutely unremunerative, or the prospect of their becoming remunerative is so far removed, that I do not think Government in Irrigation Department could possibly afford to undertake or aid in the preparation of land for irrigation. The advisability of making takkavi advances for the purpose is a question for decision in Revenue Department.

Deficiency of supply in the hot season generally means also deficiency of supply in a year of drought, and, when it does, must, of course, prove fatal to the prosperity of an irrigation scheme. Even when it does not imply shortness of supply when the local rainfall is deficient, failure of supply during the hot season must injuriously affect the progress of irrigation, as it effectually bars the irrigation of sugarcane, seed-beds of first-class rice, and other remunerative crops, facilities in the cultivation of which afford a main inducement to resort to a canal.

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* The main promoters of the Orissa irrigation schemes were Madras officers, who evidently expected that the same eagerness to avail themselves of canal water would be shown by cultivators in Orissa as had been exhibited by the Madras ryots of the deltas of the Kavari, Godavari, and Kistna rivers. But I am strongly of opinion that the rainfall, from June to October, is much greater in Orissa than in the Madras deltas, and the only returns of rainfall which I possess seem to support this view, which is, I think, worthy of careful examination. In his daily weather reports, the meteorological reporter gives as average rainfall of July, August, and September, at—

Cuttack - - - -	32·43 inches.
False Point - - -	41·58 ,,
Masulipatam - - -	17·79 ,,

I have no means of ascertaining the average rainfall from June to October at Tanjore and Trichinopoly, but suggest that it should be ascertained; also that of Rajahmundry and Coconada, for the Godovari delta, of which the climate must be almost exactly similar to that of the immediately adjoining delta of the Kistna.

BENGAL.

Bengal.

Colonel Haig.—Unless irrigation has previously been commonly practised in a tract of country where new canals are opened, so that the value and the proper mode of applying water to crops are generally known, it is probable that the extension of canal irrigation must always be slow at first. The people must satisfy themselves by actual trial what the water is really worth as compared with the price charged for it. This will take time; three or four seasons probably. Another point they will make sure of before they commit themselves to the use of the water is the manner in which it will affect their rents, whether the landlord will raise his rent if irrigation is practised, and if so, how much. They will also be careful to ascertain by trial or observation whether the water can always be got just when it is wanted, or whether there are uncertainties about this, and possibly delays. All that Government can do to hasten the extension of irrigation is to afford the people every facility and encouragement in satisfying themselves upon the above essential points. The proper means for this are—

(1.) The introduction at starting of a carefully-considered system of distribution and revenue management.

(2.) Suitable water-rates. These should be a little below what the people believe the water to be worth, even though through ignorance they may greatly under-estimate its value.

(3.) The extension, as quickly as possible, of village channels. The people should, as far as possible, be induced to make these themselves; but if they will not, it will be cheaper for Government to make them than to let the capital sunk in the main canals and distributaries lie idle for lack of the last and most essential links in the machinery of distribution.

(4.) Whatever rates and system of revenue administration may be introduced at starting should be rigidly adhered to for at least five years.

Half that time will elapse before the villagers even understand what the system is. Nothing is so fatal to success as changes of any kind. As soon as the cultivators are satisfied that irrigation at the rates fixed is profitable, that it is available in all years and at the proper seasons under a system of sale and distribution which is suitable and invariable, and that the use of canal water will not entail any difficulties with the landlords, they will take to it wholesale, and learn

IV. Qn. 23.

Bengal.

to regard it as quite as essential a part of the agricultural system as ploughing or manuring.

In Orissa, every one of these essential conditions to the rapid extension of irrigation was violated from the very first. A rate of Rs. 5 was demanded for rice, whereas experience has shown that Rs. 1-8 is the most that can be hoped for for years to come. The revenue system was constantly changed, and always of the very worst. Over-zealous officers attempted to force the people to take the water. The consequence was for a time a violent prejudice against the use of it, and a state of popular discontent which led to the adoption of sweeping reforms and the introduction of proper system and suitable rates. This took place in 1872. The rates were then lowered to Re. 1 per acre in the case of leases executed before 1st May, *i.e.*, before any idea can be formed of what sort of a season the coming one is likely to be; and Rs. 1-8 for all leases executed after that date, *i.e.*, for water used chiefly for saving crops threatened with injury or destruction from drought. The new system was strictly adhered to, and administered with great firmness, and at the same time consideration, by the special revenue officers appointed, and the consequence has been that in the course of five years popular opinion has so entirely changed that not only has it been found practicable to raise the Rs. 1 rate to Rs. 1-8, but almost all the irrigable lands are now being leased for a term of five years at this rate.

None of our canals have reached the state in which any further extension of irrigation is unlikely, except perhaps the Midnapore Canal.

No difficulties are met with in Bengal in preparing land for irrigation for the first time. There is delay in the extension of village channels, but every inducement is held out to the people to make them as quickly as possible. In the Shahabad and Patna districts it is probable that, in the case of villages taking three-year leases, the village channels will be made by Government and paid for by the villagers by instalments.

Bombay.

BOMBAY.

Mr. Hughes.—The causes which have operated to retard the extensive use of canal water are explained in the Revenue Report attached to be the poverty, ignorance, and indebtedness of the cultivators, their extreme dislike of change in their long-established system of agriculture, the sparseness of the population, and finally the shortness of the supply during the hot season on some of our works. Another cause to which I have already alluded also, I believe, affects the extent to which the people irrigate the poorer crops. It is the fear that if they take the water the land irrigated will be permanently assessed at bagayet rates at the next revision of the settlement. In many cases the revision settlement falls due within a few years, and from the people's point of view the fear is a natural one. It takes a long time to eradicate such an idea, once formed. It is manifest that the assurance of the canal officer or even of the revenue officers on this point do not carry much weight, as the people are aware that they are not the officers who will re-classify their lands when the time comes.

The causes enumerated above exist on all our new canals. Any measure affecting the indebtedness of the people and tending to relieve them from their embarrassments, or placing a limit on the demands of the sowcar, would improve matters, and on works on which the supply during the hot season is unreliable the construction of storage reservoirs would remove one of the causes which prevent an extension of irrigation.

As regards the other causes, time alone can effectually cure them, and the improvement which has taken place during the last two years is a hopeful indication in this respect. The people have learned, at least to some extent, the benefit the canal is to them in a year of drought, and that by its means they can always ensure their crop, and it is beyond belief that they will not hereafter learn to apply the water to improving the out-turn of their crops, which would doubtless be effected even in years of good rainfall by judicious use of water.

3. None of our canals can be said to have reached the state in which any further extension is not likely, or is likely to be small. I ought perhaps to except the Rewari canal in Satara, an old work restored by Government which has been in operation some years, and on which the people show but little disposition to use any but the perennial water, which they fully utilise. Like the Krishna canal, this work is located in a district of favourable rainfall; and irrigation, except during unusual years, is not necessary for the ordinary crops; but in this case I believe that if the perennial supply were increased, there would be a proportionate increase in the area of other crops irrigated.

4. As regards the difficulty of preparing land for irrigation for the first time, inquiries on the subject, made recently, confirm the opinion that for a large proportion of the land under our new works very little indeed is required to fit the land for irrigation of ordinary rabi and kharif crops. Generally the erection of small bunds dividing the fields into small plots, and in some instances a little rough levelling with a species of sledge in common use for the purpose, is all that is required, and the expense is very trifling. In one instance a canal officer estimates that an expenditure of Rs. 5 to 10 per acre would suffice to bring one-fourth to one-sixth of the generality of land under command of new works into a fit state as regards levels and ploughing for permanent irrigation.

For perennial crops and the best sort of rice the expense is greater. In the case of experiments in rice cultivation made some years ago, the expense of preparing the land varied, on different canals, from Rs. 3 to 20½ per acre, the average being Rs. 14. This includes in some cases the cost of ploughing and transplanting, and was the actual cost to Government, and it may be assumed that the work was most thoroughly done. As a rule, the formation of watercourses is not a considerable item of expense, as in most cases the canal or branches constructed by Government bring the water within each village boundary, and minor branches constructed by the people cannot be very long nor can they involve any heavy work.

The difficulties in this respect no doubt to some extent retard the extension of irrigation, but they are being gradually overcome. On some of the works, owing to the sparseness of the population and the low rate of land assessment, the people undoubtedly find it pays them better to cultivate a large area without irrigation, which costs them but little trouble and from which they reap a light crop, in preference to resorting to irrigation for a restricted area, to which they have to devote a large proportionate amount of labour and care. See paras. 160 and 262 of the Revenue Report attached.

5. The Land Improvement Act (No. XXVI. of 1871), and the rules passed under section 18 thereof, provide fully for advances being made for the preparation of land for irrigation; but, as far as I am aware, no advantage has ever been taken of it on lands under command of our new works. Wherever the people allege the cost of the preparation of their fields as a reason for their not taking water for irrigation, they might be encouraged to apply for advances. I think that under Rule II. of the rules published at page 874 of the *Government Gazette* for 1873, the canal officer might be empowered to receive applications for advances and also to make the local inquiry necessary for advances under Rs. 5,000. I would make provi-

sion for a fixed annual sum for each work in the Irrigation Budget, and would debit the amounts to the capital accounts of the works, crediting the recoveries to the same head. I have no reason for supposing that even then the privilege would be extensively taken advantage of, but it seems to me desirable to simplify the process for obtaining small advances. The canal officer can always encourage a cultivator to apply for an advance, and it would be a great matter if he were empowered to aid in obtaining it under the Act and not be obliged to refer the applicant to another department, the officers of which might not be within immediate reach, and who might not take the same active interest in expediting a decision on the application. I would leave the power of granting a certificate for the advance in the hands of the collector, as at present.

6. As already stated, I think the shortness of the supply during the hot season does affect the progress of canal irrigation on some of our works. Irrigation is most profitable where crops can be grown in a regular rotation, the basis of which is the area of perennial irrigation. The most successful of our works are those where the perennial supply is most liable, and I think it certain that the total area of permanent irrigation will increase only in proportion to the area of perennial crops irrigated. By permanent irrigation I mean irrigation independent of the rainfall. During years of drought, of course, a larger proportion of inferior crops will be irrigated, but in the next favourable season a rotation of which perennial crops form the principal factor will be reverted to. The experience on old works in Khandesh as well as that on our new works suggests this opinion. On this subject I would invite attention to para. 163 of the Revenue Report attached. On the other hand, if the people could be brought to change their system of agriculture and resort to rice irrigation, a perennial supply would be of far less importance.

MADRAS.

Mr. Sullivan.—The causes are not far to seek. In the first place the Hindoo ryot is eminently conservative and slow to adopt any innovation, especially when he does not clearly see that it will benefit him to do so. There is no idea more general, or more fallacious, than the hypothesis that water has only to be brought to a hitherto unirrigated tract for all the people to scramble for it and at once to convert their dry grain lands into rice-fields. This may be, and often is, the case in a part of the country where the advantages of irrigation are generally known and the mode of rice cultivation is understood; but where this knowledge is wanting there are several reasons why the ryot should hesitate before quitting the path trodden by his ancestors for centuries. In the first place, capital is required to level and ridge the ground intended to be irrigated; then there is the question of enhanced assessment in the shape of water-rate which he will have to pay; again, the possibility, nay, the probability, of the land becoming barren for a time by saline efflorescence, has to be considered, as also in some cases the precariousness of the water-supply. All these considerations, apart from a perfectly natural prejudice against hastily adopting a new mode of agriculture which may or may not turn out profitably, serve to explain why the extension of irrigation should be slow in localities where previously cultivation has been carried on without the artificial application of water. Reference is made in the question to the Madras Irrigation Company's works at Kurnool. In 1866, when the writer was acting for a short time as collector of the district, all these causes operated against the canal water being utilised. There was first of all the fact that the ryots had always grown cholum (*Sorghum vulgare*) and other dry grains which formed the staple food of the country, the straw of which was considered far more nutritious for cattle than rice straw; there was precariousness of supply, inasmuch as the company could not guarantee water after the 31st December when they were under agreement to Government to close their head sluices so as not to injuriously affect the supply of the previously existing works in the Kistna delta; and in several localities, where the experiment of flooding had been tried, saline efflorescence had appeared, rendering for the time sterile land which before had been fertile, so that altogether the Kurnool ryot came to the conclusion that it was hardly worth while to pay an enhanced assessment of Rupees 4 per acre for benefits which were, to say the least, questionable. The year 1866, however, was one of drought and scarcity in those parts, and the ryots began to waver in their determination not to buy the precious fluid which was flowing idly by them. A little judicious management at this crisis might have weaned them from their prejudices, and have secured to the company a number of customers; but in spite of the deprecatory warnings of the Revenue officers of the district, who, for the sake of the ryots, and in the interests of the company (which, owing to the State guarantee, were identical with those of Government), were most anxious that some satisfactory arrangement should be arrived at, a shortsighted and rapacious policy was allowed to prevail, and this time of all others was chosen to raise the water-rate from Rupees 4 to Rupees 6 per acre.* Under such a mode of administration it would have been a matter for surprise if the extension of canal irrigation in Kurnool had been otherwise than slow. It is asked how these obstacles to progress can best be removed and the people induced to accept promptly the benefits afforded by artificial irrigation. When commercial enterprise desires to introduce a new article to the notice of the public every effort is made to conciliate them in its favour; it is widely advertised, samples are distributed, and possible customers are invited to satisfy themselves as to its merits. It is thought that much the same course might advantageously be adopted to enlist the sympathy of the agricultural community in new irrigation projects in localities where the benefits derived from the artificial application of water to the cultivation of the soil are not well understood. Let them have the water free or at a nominal rate for two or three years, and, having once realised its advantages, they would not care to forego its use when the time came for imposing an equitable charge. This would, to a great extent, obviate the necessity for advances to bring the land into condition for irrigation, and where needed the capital required could be obtained under the provisions of the Land Improvement Act, which are yet but imperfectly known and understood by the cultivating classes.

Lieut.-Colonel Mullins.—The extension of the use of canal water in this Presidency has not commonly been slow. The principal Government irrigation works are near the coast, and in the coast districts at any rate the people have shown a strong desire to take water, the demand being often much in advance of the supply.

The disinclination of the ryots to avail themselves of the water of the Madras Irrigation and Canal Company's canal has, however, been marked and disappointing. The absence of success is due to several causes, among which the chief are probably—

(1.) Prejudice of ryots against irrigation, to which they were not accustomed.

(2.) Difficulties resulting from inappropriate and complicate administrative arrangements, which made it almost impossible for the ryot to understand how he could get water, and what he would have to pay for it.

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* *See* Appendix B.

I. IV. Qn. 23.

Madras.

(3.) Inefficient revenue arrangements.

(4.) The description of soil of much of the land commanded. The regur, regada, or black-cotton soil of the Kundar valley is in seasons of ordinary rain-fall highly productive when cultivated with dry crops, and cholum is the staple food of this part of the country and much appreciated by people and cattle. The people do not believe that irrigation would suit the soil, or that it would be possible to make canal water an even partial substitute for rain, and they were, and are still, averse to the conversion of their lands into paddy-fields. During the famine they were, to some extent, persuaded to try the effect of watering the dry crops, and some good crops were raised entirely in this way without any rain. This experience will doubtless lead to a more extended use of water when the rain-fall is scanty, but this year (1878) the rain-fall has been more than ample for the dry crops, and consequently but little, if any, canal water has been taken for such. It may be noticed that in the Kistna delta much very similar land is successfully and regularly irrigated.

(5.) The water-rate* for rice or paddy is higher than is usual under Government tanks in the neighbourhood of the canal. It is difficult to judge whether these charges have had any material effect in deterring the ryots from irrigating, seeing that they appear to have had very imperfect information as to what they had to pay, but it would have been a good plan probably had the full rate been reached by four instead of three increments.

There are no similarly circumstanced Government works of irrigation, but there are parts of the country in which there are tanks of native construction and of some magnitude, the cultivation of the fields under which with paddy the ryots look upon as of secondary importance to their dry crops, and these latter obtain the first attention. In the coast districts this preference is never shown, probably, generally, because the soil is better suited for irrigated than for dry crops.

Mr. Wilson.—I do not think that it can be said of the Kistna and Godavari systems that the extension of the use of the canal water has been slow. There is only one part of these tracts where I know water to have been steadily refused—part of the Tenaly division of the Repally taluk of the Kistna. Elsewhere water is sought with avidity, and the difficulty is to keep pace with the demands of the people. In the Kistna the scheme is not more than half complete, and the only obstacle to its extension and completion is the refusal of funds by the Government of India until the Capital and Revenue accounts have been furnished.

In the Godavari the greater part of the scheme has been completed.

Irrigation from the Godavari anicut began in 1847–8. Before that the recorded area of wet land in occupation was acres 84,503. In 1875–6 it was acres 525,398. Kistna anicut irrigation dates from 1855–6. The area of wet land in occupation is acres 59,675; in 1875–6 it was acres 264,256.

There are no difficulties in the conversion of dry land into wet that the most ordinary ryot does not feel himself quite superior to.

The existing system makes no provision for advances to cultivators for the adaptation of their land to irrigation; any system of advances for the purpose of cultivation can, in ordinary circumstances, be productive only of mischief; it destroys independence and thrift, and fosters a breed of pauper ryots.

A very large supply of water for irrigation in the hot season is not expected anywhere. In the Kistna there is none at all; the canals are then all closed for clearance.

The hot season in India is like the winter in England,—the time that the land hath rest. Shortness of supply at that time of year can have no effect whatever on the progress of canal irrigation.

Mr. Foster.—In this district the extension of the use of canal-water has not been slow. There are no obstacles to it here, nor are any of the canals in an unsatisfactory condition as far as their utility is concerned. In regard to the works of the Madras Irrigation Company, the extension of the use of canal-water has been slow. That canal has been taken through country in which, up to then, irrigation was almost unknown; the nature of the soil generally, in the opinion of the ryots at least, was not such as would allow wet crops to take the place of dry. Again, the lower subordinates of the company would often conduct themselves towards the village authorities as their superiors, and the village authorities, on that, would not allow any of their villagers to take the water. As I have said before, the villagers will not listen to any one who comes in the name of a department or a company, with the single exception of the Revenue Department, unless he can force them to listen by his own personal influence. The subordinates of the company have failed to exert this influence.

No difficulties need be met with in preparing land for irrigation for the first time. All fields can be subdivided by the ryots. They only have to put up boundary marks, and to apply for the subdivision, and it is done. Practically, there is no limit to the subdivision which they can have. Also, if there is sufficient water in the canals, it will be given at half rates to people who are wanting to prepare their land for irrigation for the first time. There is certainly here no necessity for making advances to cultivators to adapt their land for irrigation. The expense and trouble of thus preparing the land must be very small in cases where, as in the Godavari delta, the soil is better adapted for wet than dry crops. The shortness of supply during the hot season has not affected the progress of canal irrigation.

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* 3 Rupees first year.
4 „ second year.
5 „ third year.
6 „ fourth and afterwards.

IV. Qn. 24.

QUESTION 24.—MODE OF MEETING CHARGES ON UNREMUNERATIVE BUT NECESSARY WORKS.

Where the financial prospects of projected irrigation works are not such as to appear to justify the outlay of public money on them in expectation of the income being at an early date sufficient to cover all the expenses, including the charge of interest on capital outlay, do you think that a special rate to make good the deficiency might properly be charged on the district for the benefit of which the works are designed, or on the land that would be protected, and if so, under what conditions? If not, what are your objections? How would you meet the case put in this question, if not by some such special rate? Is it more equitable to place a compulsory charge on other districts which can probably derive no advantage from the works, or only on the districts or lands that can benefit? If the protection to be given by such works to particular districts is deemed of great importance under conditions such as have been above stated, what course do you think should be taken, having regard to the necessity for protecting the general finances of the country?

PUNJAB.

Captain J. W. Ottley.—The conditions of the financial success of canal projects in various parts of India are so essentially different, and so many different cases would occur in practice, that it seems impossible to give to the points raised in the above questions a specific reply which should be equally applicable to all the cases which might arise in practice.

For instance, there is first the tract of country which is ordinarily not in want of irrigation, and where there is little or no hope of canal works ever proving remunerative, but where it is considered that a canal should be made as an insurance against famine. Here perhaps it might be right to impose a compulsory protection rate, much on the same grounds as embankment rates have already been imposed in some parts of India. It would, however, appear open to question whether, even in these cases, it would not be preferable to afford the required protection by the improvement of communications, whether by rail or road, rather than by canals. It may, however, be at once said that this case does not apply to the Punjab, because in those parts of this province through which canals are likely to be projected the country is so dry that extensive cultivation without the aid of irrigation is ordinarily impossible, and, as a matter of fact, canal water is eagerly taken up wherever the rates are fixed sufficiently low to admit of the cultivators making a fair profit by its use. Here the only question for consideration is whether the capital cost of the project is such that the interest on it, together with the working expenses, can be met from such rates as experience has shown that the people are able and willing to pay. It is considered that if, owing to engineering difficulties or other causes, the capital cost cannot be reduced within the required limits, it will generally be better to dismiss the scheme as impracticable, rather than to impose a compulsory rate on an unwilling population. Indeed, it may be laid down as a general rule that in this province no canal project should be entertained unless reasonable grounds exist for believing that it will prove remunerative, or, at any rate, self-supporting, within, say, 10 or 15 years after the completion of the works.

As regards the Punjab also, it may be said with confidence that generally it would be neither desirable nor expedient to impose a compulsory rate on the lands through which projected canals would have to pass, because these tracts are as a rule, previous to the introduction of canal irrigation, so sparsely populated and so poor that they would ordinarily be quite unable to bear such an additional burden as is suggested in the above questions, and the attempt to impose such a rate under these circumstances would make the administration of government most unpopular.

But besides all this, it can be shown that a compulsory rate may be, at any rate in some instances, positively harmful. A case in point is the present condition of some tracts of country watered by the Western Jumna Canal. Here an enhanced land revenue was assessed at the last settlement on certain areas deemed by the settlement officer capable of being watered from the canal. This rate was levied whether the lands received water or not, and was in fact a "compulsory rate," pure and simple. The result has been that the people have continued to take canal water long after it was desirable that it should have been withheld on account of the rising of the springs and the general water-logging of the country; the canal officers have been powerless in the matter, *because*, owing to the compulsory rate, the cultivators had a right to the water.

Had it not been for this compulsory rate, the water in these parts could have been largely restricted, and passed into other drier tracts where it was really urgently required; and thus a double benefit would have been ensured.

It has been said above that as a general rule canal projects should not be entertained unless they are likely to prove remunerative, but even in this case the question still remains as to how the interest is to be defrayed during construction, and up to the time when the works shall be self-supporting.

It has also been pointed out that it would ordinarily be impossible to meet this interest in the Punjab from compulsory rates imposed for that purpose on the lands to be watered; but it may be desirable to inquire whether—first, the district, and secondly, the province, could not afford the necessary assistance, for it must be remembered that the mere construction of any great public work necessarily adds to the wealth of the district in which it is being carried out, by the expenditure within its bounds of a large sum of money, and moreover that, in such a dry country as is presupposed, the additional cultivation rendered possible after the completion of a canal must also increase the general wealth and prosperity not only of the actual irrigators themselves, but also of the district as well as of the province in which they are resident.

The condition of the various tracts, and the circumstances of the canals which might be projected to pass through them, are, however, so various, that it would appear impossible to lay down any general rules for the treatment of all cases alike, and it is believed that Government would have to deal with each one separately after a full consideration of all the facts involved.

It might in some cases perhaps be possible to meet the charges from the surplus revenues of the district, in others it might be necessary to transfer the burden to the province, or even to the general resources of the empire, and the decision would to a great extent be determined by the magnitude and importance of the particular work.

At first sight, the proposition to impose the whole or any portion of the charge for a canal project in the Punjab on the general resources of the empire may appear to be inequitable; but it is believed that a slight consideration of the actual facts will show that this is not the case.

The figures about to be given will be found at pages 13 and 14 of the statements of accounts prepared by the Examiner, Public Works Accounts, up to the end of the official year 1877–78. They are published in the Revenue Report of this Department for that year, and immediately follow the Chief Engineer's Review.

From these figures it will be seen that the total capital of all kinds expended on all the irrigation works of the Punjab amounted on the 1st April 1878 to Rs. 3,96,91,858; of this sum Rs. 60,88,524 were due to contributions from native states, and we are not therefore immediately concerned with these amounts. Of the remainder (Rs. 3,36,03,334) Rs. 1,64,48,438 were obtained from *ordinary* funds, that is to say, were derived from the ordinary revenue of the empire from year to year, and the balance (Rs. 1,71,54,896) was obtained from *extraordinary* funds, that is to say, from money which had been borrowed and on which therefore interest is clearly due.

Now the *net revenue* of all the canals, as given in the statement referred to has amounted altogether to Rs. 3,83,02,397. This includes the net direct income (Rs. 1,14,08,743) and the so-called indirect income (Rs. 2,68,93,654). This latter is also included, because it is, as a matter of fact, as much the income of the canals as that which is derived from the actual water-rates, for this income would not have been levied by Government had it not been for the canals.

Now the *net* income of the Punjab canals having been up to the end of 1877–78 Rs. 3,83,02,397, let us deduct from this the *whole* of the ordinary expenditure, *viz.*, Rs. 1,64,48,438, and from the remainder, *viz.*, Rs. 2,18,53,959, let us again deduct the whole of the interest charges on extraordinary expenditure, *viz.*, Rs. 32,05,689, and the balance, Rs. 1,86,48,270, will clearly be the gain which has accrued to the Imperial treasury from the operation of the Punjab canals.

Ch. IV. Qn. 24.

Punjab.

Under these circumstances it scarcely seems unreasonable to suggest that, until the account is balanced, the Imperial Government should be asked to defray the interest charges on new canals rather than that additional taxation should be imposed on a province which has already so largely recruited the Imperial resources.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Board of Revenue.—The Board deprecate strongly the imposition of a special rate on account of prospective advantages, a rate which could not be met from the profits of irrigation. No cultivator would appreciate the propriety of Government taxing him because the land he occupied would be protected from drought at some future time, and that by a canal which was not giving, and was not likely to give him for some years, any water for the irrigation of his land. The outlay is largest at a time when the canal is unable to give out any water. The imposition of a special rate in these provinces would be all the more severely felt in the North-Western Provinces, where the canals are not opened out by degrees, as they are in the Madras Presidency, but are nearly completed before any water is thrown into them. (See Roorkee Treatise on Civil Engineering, vol. II., page 404.) If the canal runs through a tract in want of canal-irrigation, and is constructed with due regard to economy, the original outlay will eventually be repaid and adequate interest also secured from the sale of the water (in other words from the occupier's rate). A canal ought to be a remunerative work, both directly in its returns of income, and indirectly in the form of insurance of the Government demand. The Government benefit very largely in a dry year, even where the income only just covers the cost of construction and maintenance, for the supply of water for which they receive payment serves to bring in a considerable amount of land revenue which would otherwise be lost. The Board are opposed to the suggested special rate, whether it be leviable on the land irrigable from the canal, or on the district or districts which the canal will benefit, or on those "which can probably derive no advantage from the works." The Board would observe that it can hardly be said of any district in the provinces that it would probably derive no benefit from the canal, inasmuch as canals keep up the food supply, especially in a year of drought, and though a distant district may not benefit directly, it must benefit indirectly to the extent that the canal, by supplying certain districts with grain, prevents these last districts from draining distant markets.

Mr. Anderson.—(1.) Certainly not. If canals do not pay it is due to their having been constructed when they were not wanted, or to errors in engineering particulars, such as supply available, cost of works, &c.

(2.) North-West experience shows that when the supply is steady the demand is so too, and that the people are ready to pay for the water a sum that, if the works are properly constructed, will cover interest charges.

(3.) If the cause of financial failure would be due to expensive nature of works, the canals should not be constructed.

(4.) The district likely to be benefited is too small a unit; the province is more expedient, and in most cases more equitable. Orissa has helped to pay the interest charge of the East Indian Railway in its earlier years, without getting any benefit from the works; why then should not the districts in the Gangetic valley of Bengal pay for the interest of the Mahanadi canals?

(5.) Make the works from surplus income.

The subject should be dealt with on a broad basis.

If it is the duty of the State to provide against famine, and none can doubt this, is it needful to discuss the source from which funds for the purpose are to be obtained? If the affected districts are only to pay, the result may be constant artificial famine. Again, if the charges are distributed over the empire, they will be less felt than when laid on a few districts. Lastly, where is the line limiting the liability to end? It would be as reasonable to ask Orissa to pay for its canals as to ask the Panjab to pay for the Scinde-Panjab Railway, or for the barracks of the European force contained in it.

Colonel Brownlow.—In localities where a Government irrigation work would periodically protect a district from famine, although the constant demand for water would not be such as to warrant expectations of the income covering interest and maintenance charges at a reasonably early date, I think that a protection rate might fairly be charged on all lands protected by the work. I would define protection by capability to irrigate during time of drought one-third, or as a minimum one-fourth, of the area charged with a protection rate. I think that any indirect protection from famine afforded by the proximity of an irrigation work to districts not actually irrigated should be regarded as a lessening of the burthen of future expenditure on famine relief, and as such reckoned an advantage to the general finances of the country, but not one for which a protection rate ought to be levied. And in assessing the rate strict regard should be had to the benefit conferred on the land, *not to the cost of the work.* In proposals for levying a protective rate that have come before me, the necessity for making good the deficiency of income from the interest and maintenance charges appeared to be the sole guide in fixing the amount of rate.

Bengal.

BENGAL.

Colonel Haig.—The question is, where the direct returns from projected irrigation works are not likely to be such as to cover the charges for interest and maintenance, is there any objection to a special rate being charged on the district benefited by the works to make good the deficiency? This question has reference to "projected" irrigation works. Assuming that a projected irrigation scheme is simply a *necessity* for the district for whose benefit it is intended (and under no other circumstances probably will any such scheme be carried out in future), I see no objection to the levy of such a rate as may be necessary to make up the difference between the charges for interest and working expenses and the receipts from irrigation and navigation. But it may be a question whether the rate should be levied only on the "district" within which the works lie. I should rather think it more properly leviable on a larger area, as the indirect benefits from the works, in the shape of protection from famine, will certainly extend over a much larger tract of country than that actually irrigated by the canals. If the works be carefully planned to deliver no more water than there is reason to believe there will be a demand for, and *low* rates be charged, irrigation will be universal to the extent practicable, and the balance of charges to be covered by special taxation so small that, if spread over a large area, it will be little felt. The difficulty of assessing such a rate would be found only in the case of isolated schemes, because it may be impossible in such cases to draw a line at the point where the benefits from the scheme cease to be felt. But taking a whole

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BENGAL.

province such as Bengal, and supposing a general scheme of public works (not necessarily involving any excessive expenditure) to be drawn out, by which every part of the province will in some way or another benefit, then a general rate, such as the present Public Works Cess, seems to me an admirable and most equitable mode of providing for a portion of the annual charges which such expenditure must entail; and I believe that, if the works are judiciously planned, a low rate which will be little felt will not merely cover any deficit, but leave a considerable surplus available for other public improvements. I believe that the results so far of this system in Bengal point directly to this conclusion. Especially in the case of works of communication, as canals and railways, is this principle of importance. A charge upon the goods carried is the worst possible form for the country in which the necessary provision for interest and working expenses can be made. It is right, of course, that the goods and passengers carried should bear a large, perhaps the larger, part of the cost; but the more that can be thrown upon the country generally, the lower will be the cost of carriage and the greater the value of the communication. If the rates on the East Indian Railway could be reduced by any such method one-half, the value of the railway to the country would be quadrupled.

As a general rule, irrespective of any special necessity such as may arise in particular cases like that assumed in the question under reply, I would say I am decidedly in favour of a part at least of the charges for all public works, such as canals and railroads, being defrayed by special compulsory taxation distributed over the widest possible area, such as the present Public Works Cess, which fully covers all charges for interest on works hitherto constructed and also supplies a margin for fresh works.

With regard, however, to the difficulty about schemes which, if carried out in the ordinary way from local funds, might not return sufficient to cover the charge for interest, it may be well to point out that in Bengal the co-operation of the zemindars is now being enlisted in local schemes for which they are willing to guarantee the interest on a part of the cost, the balance being defrayed by a grant from provincial funds. By this system of grants-in-aid it is probable that much may be done for the extension of irrigation in districts from which it would be excluded, if the works could only be carried out under the operation of the rules applicable to extraordinary works.

BOMBAY.

BOMBAY.

Colonel Anderson.—I do not think that a special rate applied on a limited protected area would be successful at first. It would not be successful, because, unless the rate were a heavy one, it would be unproductive in amount, and if a heavy one it would produce the most intense dissatisfaction.

It would not, in my opinion, be just, because it would be absolutely out of the power of many cultivators at once or at any early time to make use of the water. Some might want means to buy the additional cattle required for cultivation, some might hold undulating land costing much to prepare; therefore the compulsory rate would hit them very unequally compared with those holding comparatively level land. In fact, a dozen differences of circumstances may be imagined for different individuals which would render the incidence of a sensible compulsory rate most unequal.

I would meet the case by a general rate of insignificant and imperceptible incidence, the total produce of which would amount to a very considerable sum, much above what could be provided by local compulsory rates of considerable weight. I estimate that an additional famine insurance cess of six pies per rupee of assessment would, in the Bombay Presidency, excluding Sind, give about 10½ lakhs a year; such a tax would be almost imperceptible in its incidence, and would be immediately productive. This cess should be of course leviable on all lands and villages, whether inam or Government.

The produce of this tax I would devote to a fund for first construction and providing interest of the capital expended till a work began to pay itself. Moreover, I would not limit the expenditure of the proceeds of this tax to works of irrigation, but would expend it on all works offering a fair probability of proving remunerative to the extent of 4 per cent., or even 3 per cent., in the case of irrigation works, which would generally be obviative of famine, under which category I would include railways quite as much or even more than irrigation works. As soon as any work originally started on this fund paid over 4 per cent., at least half the surplus receipts should go to credit of the fund.

Mr. Erskine.—I do not believe that many of the irrigation works on a large scale can ever pay the charge of interest on capital outlay; but, in my opinion, the real remedy would be to discontinue constructing these large and costly works except where a large perennial supply of water could be assured, and to be content with smaller ones and with the encouragement on a large scale of the construction of wells for irrigation purposes.

It has always seemed to me that far too little has been done in the matter of constructing wells. I believe no works would pay Government so well, and the outlay would be so soon repaid that the enormous sums required for the large irrigation works would never be required, and the money might instead be devoted to railways. I do not of course advocate wells as a panacea for all evils; there are parts of the country where the water-bearing stratum is so deep that the water is practically useless for irrigation purposes; there are other parts where wells rapidly turn brackish; but there are also large areas where wells could be sunk almost anywhere and water be found, and the water so found remains ready for irrigation purposes when the running streams and small rivers are dry. In many parts of the country wells scarcely need to be built up; but taking all parts together, if we allow Rupees 300, or even 400, as the cost of constructing each well, then for Rs. 5,00,000, which would not go far in an irrigation scheme, 1,250 wells could be built, which, if we assume that each waters four acres, and that Rs. 5 per acre is charged, allows 6 per cent. on outlay, or, if Government desired that the cultivators should own the wells and repay the capital with interest, then I am certain that in many parts of the country the cultivators would be ready to take up any number of wells constructed in their fields and to repay the cost with interest within a very limited time. Wells diffuse the benefits of irrigation in a way canals cannot do. Every village may have its wells, whereas but a few can be within the range of canal water. Besides this, the well-to-do cultivators would be those who would wish for wells, men who would be prepared to pay for them, and thus return at once the capital to Government to be expended over and over again.

I do not for a moment wish it to be supposed that I am opposed to irrigation works on a large scale; such is not the case; but the question, "Will it pay?" should be asked in the case of each; and when the answer is unfavourable, then I would condemn the project and resort to wells, not leaving it to the cultivators entirely to build their own, as has hitherto been done, but, by offering to build them for them (or with assistance from them) on favourable terms, strive to increase the number of wells as much as possible. Large works in a country like the Deccan rarely pay. Wells, I believe, would pay quickly, and hence my desire to see their construction promoted. I am aware that the cost of irrigating land from a well is very much greater than the cost of irrigating from a canal; indeed, in many parts the cost of irrigation from wells is said to be as high as Rs. 30 per acre, and yet it pays. This is undoubtedly strange at first sight when we consider the difficulty that has been experienced in getting water from canals utilised, but it must be remembered that from a good well perennial irrigation can be secured, and this is what is really liked, and wherever perennial irrigation can be secured from canals there too I have little doubt that the water will soon be eagerly sought for.

Let there be large irrigation works by all means where they will pay; but instead of burdening the finances of the country with the cost of many unremunerative works of this class, I should prefer to see only a few well-selected ones carried out, and railways constructed as a protection against famine, in preference to increasing the number of irrigation works that do not pay. A railway always increases the value of property in its neighbourhood and stimulates production, and if canals followed railways instead of preceding them there would be a much better chance of the latter proving remunerative.

I may mention that before the introduction of the present survey system, if a cultivator wished to construct a well, he made an application to the collector, who granted him permission, and at the same time a guarantee that no extra assessment would be levied for a fixed time (often as long as 30 years). At the expiry of this period a water-rate was imposed. Since the introduction of the revised settlement nothing has been charged on newly constructed wells.

Mr. Hughes.—1, 2. On the grounds that—

(1.) Irrigation works are essential to the general prosperity of the country, which without them is exposed to constant vicissitudes from capricious rainfall.

(2.) Facilities for works exist only in certain favoured localities, and that to ensure any appreciable protection to the country generally it is necessary that all facilities where they exist should be turned to account irrespective of whether the people on the land affected are desirous of irrigation or not.

(3.) That the construction of such works benefits the country generally, and in a more direct and proportionately greater degree the people who hold the land under the immediate protection of the works.

I think that both a light general rate on the whole district and a proportionately higher rate on the lands which directly benefit are justifiable. But in the latter case I would levy the rate only on the land for which water is available, and I would exempt such land as is actually irrigated and for which water-rate is paid.

3. Were it possible to meet the general want of the protection afforded by irrigation works by constructing them only where the people expressed themselves as desirous of irrigating and paying for it, there would of course be no justification for levying any charge other than that for the actual use of the water on works constructed elsewhere. But this is not the case.

In the words of a recent report by a survey officer of great experience:—

"Should it happen, contrary to all economic law, that the ryots refuse to be enriched by resources placed at their disposal, and thereby render great schemes unprofitable, and as they are likely to be thrown on Imperial charity in seasons of drought like what India has recently passed through because of the absence of such works, which cannot possibly be provided for at a moment's notice, they should be compelled by the legislature to pay a moderate insurance rate, say 2 per cent. on the capital expended, even if they do not take the water provided; the insurance to be rateable on all the land commanded, and remitted in each case of demand for water at canal rates. This benevolent compulsion will, I am convinced, in due course of time, be admitted as one of the greatest boons ever conferred on an agricultural community *incapable* of helping itself."

Mr. Propert.—I cannot imagine a case in which the holders of land in no way under the influence of a canal could be equitably made to pay extra rates simply because a canal exists in the district in which they happen to reside. A special rate might be charged upon land *really* protected by an irrigation project, but such protection should be fairly *proved by facts*, and not merely *estimated upon paper*. My objections to the first proposal are framed upon the glaring injustice of such a measure. If it be clearly ascertained that irrigation projects are not likely to yield any return whatever, I do not consider that they should be sanctioned at all by Government. Under the most favourable circumstances, irrigation cannot be considered anything more than a mere attempt to supplement the natural rainfall; and considering that drought, if at all general, cripples severely the resources of the irrigation works themselves, I should be very sorry to see large sums of money expended on these projects, the real value of which is, I fear, too frequently overestimated by the sanguine author of the scheme. Each irrigation work should, I think, stand or fall on its own merits entirely; it would be most impolitic to impose a permanent heavy tax upon land in general for the support of a few schemes which, except under special circumstances, are likely to suffer in seasons of insufficient rainfall. In the above remarks I do not, of course, allude to tanks and canals constructed, under emergent circumstances, as famine-relief works; it may be often necessary to construct such a work in order to keep the people of the district from starvation, and may subsequently be considered desirable to complete the project, and thus protect a tract of arable country, although the prospects of revenue may be to a great extent hazy.

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Mr. Sullivan.—That it would be more equitable to recoup public outlay on unremunerative works by imposing a special local rate instead of distributing the cost over the general revenues of the country may to a certain extent, be admitted; but it is difficult to understand under what circumstances it would be justifiable on the part of the State deliberately to undertake such projects. Allusion is made in the question to their being constructed for the "protection" of the locality, presumably, in the time of scarcity; but if burdensome taxation for ever is to be the point of such protection, the remedy is likely to prove worse than the disease, and progress would be obstructed, and the continued strain on the resources of the people would leave them less capable than ever of standing up against the pressure when the time of that came round. And if the principle be admitted that it is expedient to provide irrigation *at any cost* for the protection of a province in time of drought, where is the line to be drawn? Impossible is a word not to be found in the engineer's vocabulary, and so long as funds are forthcoming a head of water may be secured in almost any locality. It seems to be a dubious policy to depart from the old rule that no projects should be undertaken save those which might reasonably be expected to pay their cost of

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maintenance and the interest on capital outlay without undue pressure on the resources of the people. When to cover expenses it becomes necessary to impose a cess exceeding the average rates of the district, such pressure is applied, and the project should be abandoned on general administrative grounds and for the reasons given below.

Lieut.-Colonel Mullins.—Compulsory special rate on all Lands protected by an Irrigation Work.—There can be no injustice in making particular districts or localities pay for protection which may be afforded them by means of irrigation works. The arrangement should be precisely similar to taxation for police or other protection. What should be the unit of territory would depend upon circumstances. The rate should be very light, and should be spread over as large an area as possible. All land commanded by the canals or reservoirs should be required to pay and land not so commanded, but within reach of the indirect benefits such as certainty of food-grains being in the country, better fodder, cheaper fire-wood, might contribute something in the shape of a still smaller rate. Lands actually irrigated would, of course, pay a fair and full rate. Nothing could be easier than to provide for such a system on the resettlement of a district, but it would not be desirable to levy a cess for any such purpose. Numerous cesses are very distasteful to natives, and natives are not singular in their dislike to imposts which are added from time to time, and which are all imposed on the same thing, viz., the land. If the land could bear the existing assessment *plus* the several cesses which have been added thereto, it should have been assessed at the higher figure once for all, and then the objects to be provided for by the cesses should have been met from the revenue. To settle the land-revenue and then to upset the settlement at short intervals by fresh impositions is, however good the objects arrived at, regarded by the natives as a breach of faith.

A district like Bellary would be greatly and prominently benefited could water be provided for it on any large scale, for it has unhappily frequently suffered from drought. All that would be desirable cannot be done, for the district has no really good river within its boundaries, but it has a good river, the Tungabhadra, for its northern boundary, and so far only an insignificant strip of country along the river margin has derived any benefit from this fact.

A practicable scheme* has been worked out for a canal by the Madras Irrigation and Canal Company, and has been abandoned by them to Government, because they were unable to raise the necessary capital. It is not financially a very promising project, but the loss on interest would probably not be very considerable, and a small rate on the protected area of about 800 square miles would make it financially feasible. Were any considerable part of the northern portion of the district well watered, such a scheme might not be entitled to favourable consideration, but there is no part so circumstanced, and there is no other means of ameliorating the condition of even this fraction of the district. What can be done elsewhere is not exhaustively known, but the circumstances are not favourable, and it is improbable that any very material alteration of the conditions of agriculture can be secured, for rain-fall is liable to be very deficient over the entire basins of all the interior rivers.

The losses of the last twelve years, could they have been prevented even in the area of 800 square miles above alluded to, would have more than sufficed to cover a protective rate, and undoubtedly the people would have been in a much happier position than is the case at present.

Mr. Turner.—I believe irrigation works will always pay in this country if carefully projected and constructed, and I believe the ryots will always take the water and pay for it if it is to their advantage to do so. I believe it would produce the greatest discontent throughout a district if you imposed a tax upon that district to bolster up a work which had turned out a failure, even though it may have been started for the benefit of that district. Nor can I see how you can tax the land which would be protected. It is not sufficient to bring water to a man's door, and say to him "use it; if you don't use it, you must pay for "having it there, as it is an assurance against future "drought and famine." I think if you imposed a tax of this sort you would produce grave discontent. But it would, I think, be unnecessary to impose such a tax, because I am certain the ryot would use the water, if it was made worth his while. Take again the instance of the Madras Irrigation Canal; the rate for water under that canal used to be, I think, Rupees 6 per acre. No one, I presume, would inflict a tax on land which "would be protected" of Rupees 6 per acre. No permanent tax exceeding Rupee 1 or 2 per acre could, I suppose, be imposed. I think the ryots would gladly take water at this rate for their dry crops, and no tax would be required.

Mr. Wilkinson.—I think that a special rate might in such a case be charged on the land which would be benefited by the projected irrigation work over and above the regular wet assessment; that such special rate should commence at a low per-centage charge over the annual wet assessment, rising gradually until it reaches, say, 10 or 20 per cent., and then as gradually decreasing. Thus a holder of wet land under the Marandahalli project in Dharmapuri paying Rupees 50 per annum should be required to pay in the first year 2 per cent. over and above the Rupees 50, in the second year 4 per cent., in the third year 6 per cent., in the fourth year 8 per cent., in the fifth year 10 per cent., in the sixth year 8 per cent., and so on. The amount of per-centage payable by each ryot would depend on the sum necessary to cover expenses and the number of years within which the State expected such expenses to be covered. To charge a ryot 10 per cent. at once, before he has, in all probability, realised the benefit of the improvement effected in the water-supply, would, in my opinion, merely cause him to throw up his land. It seems to me that it would only be equitable to make an additional and special charge on the area protected, not on the district.

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* Upper Bellary project.

QUESTION 25.—EXISTENCE OF CUSTOMARY CLAIMS TO USE OF WATER.

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Have any customary claims or prescriptive rights in the use of water from tanks or canals or water-courses grown up in your district? What is their nature and history? Have they led to inconvenience in respect to the general utility of such works to the agricultural community that might benefit by them? Would it, in any case that you know, be desirable to buy out such rights as exist, and to prevent the accretion of others? Have such claims or rights to the use of the water in the upper parts of rivers obstructed the application of the water in the lower parts to purposes of irrigation, or vice versâ*? If this has happened in any case, could any remedy be applied which would be equitable? How should disputes on such points be settled? In cases in which the action of the ordinary courts would be impossible or inapplicable, what principles should govern decisions in such disputes?*

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Captain Ottley.—On the Bari Doab canal no prescriptive rights in the use of water have arisen, but in some cases prescriptive rights in the water-courses constructed by certain individuals in the early days of the canals have given rise to a certain amount of inconvenience, because, although the water pertained to Government, the channel in which it was carried from the distributaries to the villages belonged to the individual who had originally the enterprise to make it, and he consequently charged a further rate on all lands irrigated. These channels, however, have for the most part been bought up by the cultivators concerned, or else by Government, and it is believed that few, if any, such rights now exist, and they will certainly not be permitted to grow up in the future.

On the Western Jumna canal a few prescriptive rights exist, but are not of a very embarrassing nature.

They may be divided into the five following classes:—

(1.) *Right to water in the head villages.*—When this canal was first opened in 1821 there was considerable difficulty in procuring labour for the construction of the head bunds which had to be made annually to divert the water from the river into the canal. Inducements were therefore held out to settlers, and arrangements were made with the villages whereby they were to supply so much labour on the condition of receiving irrigation for their lands rent-free. At the present day, however, the value of the water supplied is from 10 to 20 times the value of the labour given. This arrangement must, under the terms of settlement and the orders of Government, be maintained during the currency of the present settlement, which will, however, expire in the course of a few years.

Shares in village water-courses.—Formerly on the Western Jumna canal there were no Government distributaries, the village water-courses being constructed direct from the main canal at the cost of the cultivators, and, in so far as a canal without distributaries is useless, the villages were in one sense co-partners with Government in the canal, and had, therefore, to a certain extent, a right to the water carried by these channels. These old water-courses are, however, being gradually replaced by properly aligned distributaries made at the sole cost of Government.

(3.) *Private water-courses.*—There are a few private and zamindari water-courses which stand on much the same basis as those belonging to villages, and which also are gradually being replaced by Government distributaries.

(4.) *Enhanced land revenue a claim to water.*—At the old settlement an extra rate was levied on certain areas assessed by the settlement officer as capable of irrigation from the canal. This extra rate was called the "enhanced land revenue," and was collected whether the occupiers chose to water their lands or not. This extra rate amounted annually to Rs. 3,85,925, and was nothing more or less than a compulsory water-rate. So long as this rate was levied it is clear that water had also to be given, and in this sense the irrigators had a prescriptive right to the water. Under the new settlement, however, which is now in progress, this enhanced land revenue will cease absolutely, and in its place will be imposed the owner's rate, which will be assessed by the canal officers crop by crop on those lands only which have been actually irrigated during that particular season. This alteration will be most beneficial in every respect,—it will not compel any set of men to irrigate against their will, whilst it will enable the canal officers to deliver any water so released to those drier tracts where it is infinitely more required.

(6.) *Jhind and Kalsia claims.*—The fact of the canal passing through Jhind territory has been held to give that state a claim to water, which has recently been fixed by the local government at 200 cubic feet per second. A similar claim also exists on behalf of the Kalsia state, but the actual quantity to which it is entitled has not yet been definitely settled.

On some of the small inundation canals which were originally constructed by private agency, claims exist which are occasionally somewhat troublesome; some have already been bought out, and others are now under consideration, and will, it is hoped, be finally settled before long.

As a general rule, it may be said that no serious difficulty has been encountered in dealing with most of these claims, although in some cases the discussion of the terms which should be alike equitable to Government and to the claimants has been somewhat protracted.

No case is known in the Punjab of the application of the water in the lower parts of rivers to purposes of irrigation being obstructed by claims or rights to the use of the water in the upper parts, or *vice versâ*, and if any such exists the inconvenience is so slight that it has not as yet been felt. It is believed that most rights can be bought out, not necessarily by paying down money, but perhaps by permanent remission of demands commensurate with the injury entailed, or by a reconsideration of the terms of settlement. Disputes on such points would ordinarily be settled by order of the local or Supreme Government, according to the magnitude of the question involved.

Mr. O'Brien.—The right of the irrigators to take water from all the canals in the district is prescriptive. Both the State and the persons through whose lands the canals pass own the canal beds, but the rights of the State and of the landowners have become so intermingled that it cannot be said that the ownership rests with either the one or the other alone.

Three-fourths of the canals were excavated and maintained by the irrigators. The remaining fourth consists of those canals which were dug under the Government of the Nawab of Bahawalpur. In this case one-fourth of the expense of first excavation was borne by the Nawab's government, and three-fourths by the irrigators. The maintenance of all the canals has been entirely borne by the irrigators; all that Government has contributed is the power of contribution to effect the clearance, and a certain amount of supervision. It is because the irrigators have for the most part excavated and entirely maintained the canals that I say the right to take water is prescriptive. The prescriptive rights of the irrigators have not led to inconvenience in respect of the general utility of the canals. There is never any difficulty in a landowner, not an original irrigator, getting water for land within reach of the canal which has hitherto been unirrigated. I have never heard of objections being made to the extension of canal irrigation to new land. I do not think it desirable or possible to buy out the prescriptive rights. The original excavators or irrigators do not form a definite body. It would be impossible after so many changes to say who the persons were who had the prescriptive rights, though there is no doubt that those rights exist. Extension of canal irrigation in this district is so easy that the right to irrigate is rendered less valuable. It has been thought necessary in the neighbouring district of Dera Ghazi Khan to buy up the prescriptive rights of the original excavators. The canals were dug there under similar circumstances to those in this district. No claims grounded on prescriptive right have been made. The irrigators on any canal are all on the same footing in

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this matter. I have never heard of any irrigator urging superior claim to water on the ground that he had been an original excavator or an irrigator of long standing. No suits regarding canals or canal water have come before me since I have been in the district.

Mr. J. B. Lyall.—The inundation canals of this part of the Punjab were almost all constructed in the first instance by the free or forced gratuitous labour of the people through whose lands they were made, or of people to whom land was granted on the canal in lieu of such labour. The Government of the day, as a rule, only assisted by organising the enterprise; sometimes it also helped with hired labour or by distributions of food.

And after construction the canals have been maintained by the gratuitous labour of the irrigators, who have also had in many cases to dig very long kassis or water-courses to bring the water from the main canal to their lands.

Broadly speaking, all the irrigators may be held to have acquired prescriptive rights to water from these canals. I think Government would have to pay compensation in addition to remitting revenue if it diverted water from a man's land, not of necessity, but in order to improve or extend the canal.

In this respect the provisions of the Canal Act do not seem to sufficiently secure the rights of irrigators on these canals.

Certain persons claim the right to put up chaps or dams in these canals, so as to raise the water till it will flow on to their lands. The erection of such dams has been generally forbidden, as it much reduces the supply of water in the canal beyond the dam; it is sometimes still allowed under certain restrictions where the claim is of old standing and the land cannot get a flow of canal water in any other way.

The kassis or water-courses on these canals are considered the property of the persons who excavated them; other persons sometimes buy a share in them, or take water from them and pay for it. They can, of course, apply to be allowed to construct a separate water-course for themselves, and the Canal Act gives the officer in charge the power to grant such applications. I am not aware that the above customary claims or rights have hitherto seriously diminished the general utility of these canals, but I can see that they are likely to interfere with a policy of vigorous improvement and extension. A great deal can be done under the Canal Act; I do not think any additional powers can be properly demanded.

Mr. Roe.—The minor distributaries or water-courses from the main canal, which are called in this district kassis, are all private property, made by the persons taking the water. As these cannot be made without the permission of the canal officer, the grant of this permission would be considered by the people as conferring a prescriptive right to water, which would have to be compensated either by the grant of equal facilities of irrigation in another form without extra expense, or by a money payment representing the original cost of the "kassi," and a remission of the canal revenue. No inconvenience has been experienced from these rights, nor is there any necessity to limit them or buy them out. The Canal Act appears to confer on Government ample powers for dealing with any difficulty that might arise on this subject.

NORTH-WESTERN PROVINCES.

NORTH-WESTERN PROVINCES

Colonel Brownlow.—In Bundelkhand I have seen water from an ancient reservoir deliberately run to waste by the inhabitants of a village with prescriptive rights to irrigation, because, if allowed to pass down the irrigation channel to villages lower down, claims to a share in the water would be established by use. The work was, I am bound to add, not under the charge of the Irrigation Department, and the tahsildar who was supposed to look after it had most probably never seen it; but still the jealousy with which villagers having prescriptive rights to irrigate from a tank or canal regard any attempt to extend to others the advantages which they enjoy, has always led me to advocate most strongly the buying-out of such rights on any work under Government management. I can easily imagine claims or rights to use water on the upper part of a river interfering most seriously with the progress of a Government work lower down when the volume of the river dwindled down during drought to a mere fraction of its volume during seasons of good rainfall, as it would be very liable to do on rivers dependent on sources fed by rain alone.

Mr. C. C. Anderson.—(1) None known; (2) none; (3) none; (4) the Canal Act gives full powers to buy rights in the use of water; (5) not known; (6) Canal Act VIII. of 1873; (7) the Canal Act provides for this; (8) the ordinary courts are quite capable of deciding such disputes.

BENGAL.

BENGAL.

Colonel Haig.—No claims of prescriptive right to the use of water in canals or water-courses have yet come up in Bengal, excepting in the case of the Midnapore canal, which is fed from the Cossye river, a portion of the dry-weather supply of which had previously been used for irrigation at a point lower down river than the canal head. In this case an amicable arrangement was made with the zemindars, who had undoubtedly a good claim.

BOMBAY.

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Mr. Hughes.—(1.) The only instance that occurs to me is the Khari irrigation sluices in Guzerat. The prescriptive rights of the "Kalambundi villages" on this work are of long standing, and are jealously guarded. An account of them will be found in paras. 59 to 73 of the annual Revenue Report attached. (2.) No interference with these rights is, I think, desirable. The lands of the villages in question have a right to sufficient water, or, when the discharge of the river is insufficient, they are entitled to the whole supply; (3,) but there is nothing to prevent surplus water over and above the requirements of the Kalambundi villages being appropriated as Government think fit.

Colonel Anderson.—Does not apply in my experience.

Mr. Erskine.—The only instance which I am aware of in the Northern division in which prescriptive

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rights in the use of water have grown up, is in the case of certain alienated lands irrigated from the Khári river, which has from time to time been improved by Government. What occurred in the case of these lands was thus described by a committee appointed in 1874 to make inquiries concerning the Khári river, situate in the Kaira Collectorate :—

"In 1868, *i.e.*, after the summary settlement under Act VII. (Bombay) of 1863 was carried out, and sanads issued according to its provisions, Mr. Rogers, then Revenue Commissioner, N.D., in his No. 2670, of June 21st, 1867, ordered that an extra cess should be levied from all holders of alienated lands which had benefited by the improvements in the river Khári. The cess was calculated by the Survey Department, and submitted to the collector of Kaira for imposition.

"30. Suits were immediately filed by many alienees against the collector for the purpose of putting a stop to the new cess. The legal remembrancer was consulted, and that officer at once advised Government to allow judgment to go by default. This was done, and, in addition, Government ordered all collections on account of the new water-rate to be returned to the alienees.

"31. Such being the case, we are of opinion that without legislation it will be impossible for Government to levy any extra excess from holders of alienated lands who have previously used the water of the Khári, even in the event of Háthmati water being supplied annually.

"32. As regards those alienees who have hitherto not enjoyed water rights on the Khári, we are of opinion that, if an extra supply enabled them to irrigate from the stream, Government could not levy an extra rate unless the alienees asked for the water; and if the extra supply ran through alienated lands *en route* to Government numbers, the only method of preventing alienees using the water would be to buy up a sufficient space of ground on both sides to remove the stream from the actual possession of the alienees, unless payment were made for its use.

"33. We are further of opinion that legislation, having for its object the taxation of summary settlement sanad holders who may benefit by improvements in the Khári water supply, will be beset with difficulties, inasmuch as it will be almost impossible to define their original right."

I do not think it would be worth while to buy out these rights. A very large sum would have to be paid, which, in my opinion, might be more profitably expended in other ways.

In many of the rivers and streams in the Nasik and Khandesh districts the water is fully utilised for irrigation, dams having been constructed ; prescriptive rights to the use of the water exist in such cases, but Government has always exercised the right of deciding whether a new dam may be constructed or not ; of late years, however, but little has been done in the way of constructing small dams. As I have already observed, when disputes concerning the use of the water from these dams arise, they are in the first instance decided by the revenue authorities, and their decision is generally accepted ; if not, those discontented can sue in the civil courts. No change of system seems required.

Mr. Propert.—If by claims or prescriptive rights over water is meant a right on the part of any private individual to take water free, I may say that I am not aware of any such right or claim in the case of Khandesh, except as regards small inam holdings given for service or otherwise. In such cases it will be occasionally found that, as the land is situated within the "thal" or area originally set apart for irrigation, the owner has a right to the free use of water ; but claims of this kind are few and insignificant, and I consider no action regarding them to be necessary. Village communities have, of course, well-established rights to the use of water flowing from the particular bandhara or weir belonging to such village, but payment is levied for the use of the water. Village rights were determined years ago, and it would (for instance) now be next to impossible to raise or lower the old-established weir without giving rise to a crop of civil suits. This "right" to all the water drawn off from a certain weir rather tends to confuse arrangements when, as at the case at Mukti near Dhulia, a large tank has been constructed in order to supplement the general water supply of the river Panjra below the site of the tank itself (such water supply having for some years past been gradually decreasing). The water from the tank flows over all the weirs to be met with between the tank itself and the mouth of the river, consequently it is difficult to increase the irrigated area of any one village without giving all other canals *en route* the benefit of the increased supply. Such rights as I have mentioned cannot of course be bought out ; in fact, there is nothing to buy, as the receivers of the water pay all that is demanded of them. The only question is how should the increased supply of water from the Mukti tank be paid for by the occupiers of irrigated land under the various weirs or bandharas into and over which the tank water actually flows.

As regards the Mukti tank, it has, I believe, been decided that, as so much extra water is now available the additional water supply ought to represent a money value, but as yet no steps have been taken to fix the manner in which the increased value should be actually realised. The matter is under consideration; but its solution is far from easy, inasmuch as, as I have before stated, the entire contents of the new tank find their way, *not into new canals*, but into and over weirs which have been in existence for hundreds of years past.

Mr. Ramsay.—Barring canals under the Public Works Department, of which there are but three in this district, the use of water is regulated entirely by ancient custom, which has existed from a period long anterior to British rule. Only tradition exists as to their origin. Very few disputes arise in this respect. Where such have occurred, it has often been owing to ill-judged interference on the part of Government officials. Disputes as to the right to and use of water are brought in the Revenue Court of the mamledar, who can restore or confirm possession pending an application to the Civil Court ; but such applications are rare in my experience, and it is remarkable how well the people manage their own affairs when left alone. I should be sorry to see any interference with the existing system ; over-legislation and petty interference with the concerns of the people are rapidly undermining our position in India.

On the rivers on which irrigation works now exist it would not be practicable to construct new weirs or anicuts, as that would materially affect rights already existing ; but in fact the field is already fully occupied, and all we can do is to improve the water supply at its source by storage tanks. This might admit of fresh land being irrigated without trespassing on existing rights.

MADRAS

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Mr. Sullivan.—(*a*), (*b*), (*c*), and (*d*). Such claims and prescriptive rights, if they exist at all in this Presidency, do so to such an inappreciable extent as not to merit consideration. It has happened in the case of a large irrigation project traversing a zemindari or other private estate that the works have intercepted the supply of water from other sources formerly enjoyed by the proprietor. Such matters are equitably adjusted either by the grant of money compensation or by giving free of charge from the new project water sufficient to irrigate the area affected. There is, however, another subject closely allied to that alluded to in the question which deserves notice. It happens that the sources of some of the large rivers and their affluents from which the Government works of irrigation on the plains derive their supply are situate in hills covered with forests which lie within the limits of private estates; and of late years, owing to the development of the coffee-planting industry, these forests, which were previously abandoned to the tiger and the bear, are now eagerly sought after as suitable sites for planting purposes. In some places, where competition is at all keen, large prices are obtained by the owners for such lands, and the consequence is that the denudation of these hill sides is already beginning to affect the water-supply, and unless measures are taken to check it serious results are likely to follow. That the agriculturists below, who have had the use of the water for a lengthened period, have a cause of action against those by whom a diminution of the supply is caused, cannot be doubted; but the difficulty would be to fix the responsibility on any one, and to determine in a court of law how far the damage was due to the felling, and how far to natural causes. The sole means, therefore, of averting a danger which is daily becoming more imminent seems to be a strict conservancy of all such forests, and the only way in which such a measure could be carried out would be by the State acquiring the right over them which now vests in private individuals.

(*e*.) Only, it is believed, in cases where the claim in the former was superior to that in the latter.

(*f*.) The position of the Madras Irrigation Company's Canal in Kurnool and Cuddapah is a case in point. As previously stated, when the project was initiated a stipulation was made that the company should close their head sluices on the Tungabhadra (an affluent of the Kistna) on the 31st December, so that the supply to the existing Kistna delta works should not be injuriously affected. This was simply deference to a prior claim to the water and the condition could not be equitably set aside, although it seriously impairs the efficiency of the company's works. The remedy in this case is the construction of large reservoirs for the storage of water when the rivers are in flood to supplement the supply when they run low, and this, it is believed, formed part of the company's original scheme, but was abandoned for want of funds.

(*g*) and (*h*.) By a commission in which the interest of all parties should be adequately represented. Except where a private company or zemindar intervene, the interests of the State, as involved in the remunerative nature or otherwise of the project, would be best upheld by engineers specially conversant with the subject of irrigation, whilst the interests of the agricultural community, which, to a wide extent, are identical with those of Government, might be safely entrusted to Revenue officers (European and Native) of mature experience. Any decision which the Commission might arrive at would, of course, be subject to the revision and approval of Government. The concluding portion of the question offers a wide field for remark, but it will suffice here to observe that in disposing of such matters the object to be kept prominently in view is the general good. Vested interests and priority of claims should have all the weight given to them to which they are justly entitled, but when these are found to conflict with the general welfare they must be made to give way, care, of course, being taken that due compensation is awarded.

Lieut.-Colonel Mullins.—Customary claims and prescriptive rights to water.—The circumstance that the bulk of the water used for irrigation in Southern India is devoted to the cultivation of paddy probably makes the circumstances different to those contemplated by this question. Lands assessed as wet have a well-founded and first claim to water as long as it is available, and Government could not equitably divert water from such lands to irrigate other lands not so classed or not heretofore connected with that source of supply. It would be different with lands assessed as dry, for such have no claim to be supplied with water. Practically, none of the Government large works are so situated as to command alternative fields of irrigation. The assertion of a right to utilise water in tracts of country differing year by year would be inconsistent with any such arrangement as that which is the subject of question 24.

Mr. Longley.—Yes. The following are the customary claims or prescriptive rights which have grown up in the Salem district.

(1*st*.) The ryots owning lands in a particular village or a particular portion of a village are entitled to water through a particular sluice in a channel or tank. Thus, if a tank has two sluices, one of which is on a high and the other on a low level, each having a fixed extent to irrigate, the lands irrigated from the former (high level) are not entitled to water from the latter (low level).

(2*nd*.) Lands which are entitled to *surplus* water only are not entitled to direct irrigation through sluices and from tanks or channels. Lands are cultivated by surplus water only, *i.e.*, water discharged over the waste weir of a tank; and if water ceases to run over the waste weir, the crops on the lands, if raised, must suffer, though there is water enough in the tank; *e.g.*, the drainage water of fields irrigated from Raja channels of the Cauvery falls into a channel called Komarapoliem channel, which does not take its rise direct from the Cauvery, but which has a fixed area of its own to irrigate. The lands under the latter have no claim on water from the other two channels, even should the supply in the same (latter) become scanty.

(3*rd*.) Some of the river-channels feeding large tanks or reservoirs have certain arears alloted to them for *direct* irrigation. Such lands continue to be irrigated without interruption to the supply to the tank, so that the owners of these lands cannot obstruct the flow in the channel, even should the water run so short as to be insufficient for themselves. On the other hand, the owners of lands under the tank cannot object to the use of water by owners of lands under the channel under such circumstances.

(4*th*.) Where a tank or channel has lands in more than one village to irrigate, the supply to each is regulated according to the quantity required for each village, and water for the irrigating sluice of this is allowed to flow for so many hours. Again, the water allotted for each village is in turn distributed among individual holdings according to their requirements, which are also decided by the number of hours water is allowed to run through a regulating sluice to their holdings.

(5*th*.) Certain natural drainages are destined to feed certain particular tanks; *e.g.*, in the village of Velamputty, in the Mahendramangalam Mitta, there is a drainage water-course which empties its water into the Government tank of Dandukaranahalli. The zemindar cultivated one of his lands with the water of this drainage channel by diverting the same within his own limits, but a water-rate was levied on the land on the ground that he had no right to the water.

(6*th*.) In the case of Mahendramangalam zemindari, referred to in the answer to question 28, the zemindar was entitled to water for eight fields only, the assessment for which was included in the assets of his peishcush. Government claimed water-rate on all cultivation in excess of the said eight fields. These claims are chiefly founded on prescription as recognised by custom. They originate with necessity, convenience, capability of works, user, wainer, and the like, which time constitutes into custom and prescription.

No inconvenience has arisen from such claims or rights.

In case of disputes the law courts will inquire as to whether such claims were previously recognised

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and respected; village punchayats, under Regulation XII. of 1816, may also act.

Mr. Wilson.—I cannot conceive cases arising in which the action of the ordinary courts would be impossible or inapplicable.

No such claims or rights ever came to my knowledge.

Mr. Wilkinson.—The right to the water in a tank or channel resides in those persons who pay Government a higher rate of assessment for supplying or rather storing the water. A holder of dry land in the vicinity is not allowed to take the water, unless it is clear that the supply will more than suffice to meet the demand of the holders of wet lands. If he is allowed water, he is charged for it; and if he takes it without leave, he is charged a penal assessment, viz., twice or thrice the amount he would have paid had he obtained permission. I do not think that the Revenue authorities require any other powers than those they now possess to settle disputes as to water; any disputes which they are unable to settle should go before the courts.

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Question 26.—Maintenance of Certain Works by Cultivators.

If anywhere it be found that the tanks, &c. are so small and numerous that Government cannot practically carry out their supervision and maintenance, would it be expedient that steps should be taken for imposing on the cultivators or proprietors who benefit by the water the duty of carrying out all necessary repairs, or works for securing the irrigation in an efficient condition? Do you think this principle should apply to all tanks, great and small alike? Might the obligation, equitably, be held to attach without any corresponding relief being given, or should any privileges (such as lowered rent) be conceded to the ryots, if they are charged with the duty of repair? To what extent should the liability go; whether only to minor works not requiring engineering skill, or to all works? How could such a duty be best enforced, and any neglect of repairs checked at its inception? And what penalties should be legalised to punish such neglect when it does occur? Is there any local or other fund from which to pay for such work, if it consisted of more than ordinary earthwork? Could such a fund, in case of need, be established?

Punjab.

PUNJAB.

Mr. O'Brien.—The minor distributaries are so small and numerous that no Government supervision is made over them. They require to be cleared every year. The work is postponed to the very last moment by the irrigators, and the water entering the canals often prevents its being completed before the running season. Applications for remissions and reductions of land revenue on account of the failure of canal water are very common in this district, and in investigating such applications I have often found that the failure of water occurred only because the applicant had omitted to clear his small distributary; and when assessing villages, I have often wished for the power to set the crowd which was clamouring for reduction at work to clear their neglected water-courses. I think that steps should be taken to compel the irrigators to maintain in proper efficiency the small water-courses. As long as the present system of compulsory labour and fines on absentees is maintained in this district, all that is required to be done is to extend that system to the minor distributaries. The absentee fines fund exists, but it could not with justice be spent on private water-courses.

North-Western Provinces.

NORTH-WESTERN PROVINCES.

Colonel Brownlow.—I think that the proper repair of all tanks which do not require engineering skill for their maintenance should be imposed on cultivators or proprietors who benefit by the water, and where, as is, I believe, the case in Mysore, chains of tanks are dependent upon each other for safety, so that the bursting of one or more embankments from neglect would endanger a number of others lower down, the appointment of a Government inspector with powers sufficient to enforce due maintenance would, I think, meet all the requirements of the case.

Board of Revenue.—Question 26 is scarcely applicable to these provinces, where there is hardly any tank (artificial reservoirs) irrigation, the irrigation being from wells (jhils), natural ponds, and Government canals. At least, the Board know of no part of the North-Western provinces in which the tanks are so small and numerous that Government cannot practically carry out their supervision and maintenance. The Bundelkhand artificial lakes, if they should be classed among tanks, are neither small nor numerous, and it would be a farce to call on the cultivators who irrigate from them, or the zemindars in whose estates they are situated, to keep them in repair. This work must be entrusted to a professional engineer. The Board are of opinion that even where the zemindars and cultivators have a prescriptive right to irrigate from these lakes, and the land has been assessed by the settlement officer at irrigated rates, the Government are entitled, in equity, to charge water-rate, on the ground that the water supply is only maintained through the repairs, &c. made at their cost. But the Board consider that neither the landholders nor the cultivators should be burdened with responsibility which they cannot reasonably be expected to discharge, and neglect of which will render them liable to penalties prescribed by the law.

BENGAL.

Bengal.

Colonel Haig.—I have little or no experience of tank irrigation. I do not believe in the possibility of keeping tanks in proper repair by entrusting them to the charge of the cultivators and villagers who use the water. At least, I do not believe that proper maintenance could be enforced on this system without such extensive and detailed supervision by Government officers as would cost just as much as if the works were kept up by the Public Works Department.

BOMBAY.

Bombay.

Mr. Hughes. — I would invite attention to the description given in para. 103 of the accompanying Revenue Report for 1876-77 of the system existing in Khandesh and Nasik for the repair of small irrigation works. The Patfalla Fund therein alluded to was instituted with a view to relieving this department of the maintenance and petty repairs of the numerous small works of irrigation. For years the fund was collected and large balances accumulated, and very little expenditure was incurred. Ultimately this Department had to resume the work and to execute all necessary repairs from money furnished by the Patfalla Fund. The system as now administered answers admirably, and in the last annual Report on the Fund the Commissioner spoke in high terms of the efficient state to which the works have been brought.

I would urge that the system should be applied to the tanks in Guzerat and Dharwar. In the Dharwar Collectorate there are in all 3,023 tanks of various sizes, irrigating a total area of 1,05,776 acres. Petty repairs to these works have hitherto always been executed by the people, but where a work falls into serious disrepair Government step in and do what is required, a contribution being generally made towards the cost by the people. Complaints are sometimes made that the works are seriously deteriorating; and although, taking the tanks as a whole, there are facts that disprove this, the present arrangement cannot be considered satisfactory, and it would doubtless be better if some recognised system for the proper maintenance of the works were introduced.

As in Khandesh, I would nominate a patkari or chowkeydar to the charge of each tank, whose duty it would be to generally superintend the distribution of the water according to existing custom, and to at once bring to notice any damage that might occur to the works. The patkari or chowkeydar should be remunerated, if possible, by the people themselves, as in Khandesh.

These tanks require very little annual repair if constantly attended to, and any petty repairs to the earthen embankment I would leave to the patkari to effect with the assistance of the people. In addition I would levy a small annual fee on the irrigated produce, as in Khandesh, and I would allow the collections on each tank to accumulate to be expended by the executive engineer for irrigation in the thorough repair of the tank say once in every five or seven years or whenever it might be necessary.

These repairs should be carried out on regularly prepared estimates; and if the cost were more than the patfalla balance, the difference, not exceeding half the whole cost, should be made good by Government.

Colonel Anderson.—This is very much the case in the Dharwar Collectorate, which is the only collectorate in the south of Bombay Presidency possessing any considerable number of tanks. But it is only of comparatively late years that any great amount of tank repairing has been taken up by Government. It was common there for Government to undertake the repair of no tank unless the people provided about half the expense, without any claim to relaxation of liability to water-rate; many tanks were repaired and improved on these terms. Many of the tanks are so small that they only water a few acres, comprised often in the holdings of one or two holders of land. I am inclined to think that the best course as regards tanks in Dharwar is to leave them to existing arrangements, the Irrigation Department repairing them when large, or when a sufficient amount of present or prospective revenue is involved to make it worth while, and to leave the minor tanks to individual efforts. Between the very small tanks and the large ones which it is the undoubted duty of the Irrigation Department to repair, there is an intermediate class, say watering from 20 to 50 acres. I am inclined to think that the repair of these had better be left to private arrangement between the cultivators holding land below them and the authorities, and that if the cultivators will supply a part of the expense of repair Government should provide the remainder. The cultivators may hang back for a time, but, as the tank gradually deteriorates and the supply of water becomes insufficient, their own interests will ordinarily sooner or later induce them to provide a portion of the funds required. Finally, if the landholders would not provide any portion of the necessary funds for repairs and the tank became utterly inefficient, and consequently they found cultivation unremunerative, they might resign the land in question, which would then revert to Government, and the sale value of the land after the tank was repaired would in many cases fully recoup Government for the cost of repair.

No legislation for the repair of tanks can be carried out without an immense deal of Government interference, and it would be advisable to obviate the necessity for this as far as possible, since any Government interference against the general will of the people will certainly be resented by them, and prove difficult to work without extreme unpopularity.

The only kind of legislation which it appears to me might prove advisable would be that necessary to coerce a recusant minority of the cultivators under any tank, the majority being willing to contribute to repairs and to enter into terms possibly for the future payment of increased water-rate in consideration of improvements in water supply to be made, while a minority refused to join in any such agreement. In Bombay much land is inam, partially or wholly exempt from payment of land revenue. Inamdars are often lazy people, content with what they can draw from their land and averse to any expenditure on improvements. That the objections of a few of this class of people should stay improvements which the remaining holders of land desire, and are willing to pay for, is a real hardship on these latter.

Mr. Propert.—In the case of *small* tanks, the consumers of water should certainly be encouraged to undertake the duty of carrying out all ordinary repairs and conservancy, making application to the irrigation officers only in cases of real difficulty. As regards large tanks, the above arrangements should, I think, apply to the minor distributions only.

I do not think the obligation could equitably be held to attach without corresponding relief, and the best form of relief would be a comparatively low rate of water assessment. In no case could cultivators be expected to carry out any but the most simple repairs and silt clearances. If the villagers neglect to bear their part, the repairs should be executed by Government and the cost levied from the ryots; but to make such procedure legal legislation would be necessary. I think, however, that even without the assistance of a law it will generally be found that, if Government

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officers were firmly to refuse to carry out such repairs as ought in justice to be executed by the cultivators themselves, the latter would give way, and eventually carry out the order given rather than suffer injury to accrue to their irrigated crops. As yet I do not consider that the respective responsibilities of Government and the ryots with reference to the repairs and improvements to canal works have been determined with anything like sufficient clearness. In many villages of Khandesh the occupiers of irrigated land pay of their own free will a cess called patfalla in addition to water-rates, and the proceeds of this fund are expended by the canal officers on repairs and improvements of an emergent nature. The levy of the cess has not been legalised, consequently we cannot enforce payment in the case of those who refuse to subscribe. It might perhaps be well to make the "patfalla" a legal demand, but I fear that if this be done we shall eventually find the fund debited with expenditure on works the cost of which ought in reality to be borne by Government itself.

MADRAS.

MADRAS.

Mr. Sullivan.—Irrigated land is liable to an enhanced charge for the use of the water supplied by Government. This takes the form either of a water-rate imposed in addition to the land-cess, or of a consolidated wet assessment in which the two items are combined. In either case the ryot pays more than he otherwise would in consideration of the benefit he derives from the water being brought to his land, and a corresponding liability on the part of the State to maintain the supply efficiently has always been admitted. In any case, therefore, where it may be deemed expedient to transfer the cost of up-keep to the ryot, it is clear that the measure must be accompanied by a reduction of the rate previously charged equal in amount to the estimated annual charges for that purpose. Except in minor works it is more than doubtful whether the arrangement would be found to answer practically, as the ryots interested would always find a difficulty in apportioning the cost of repairs amongst themselves, and rather than pay more than their share they would allow the work to deteriorate. This could only be prevented by constant supervision on the part of the Public Works Department, the necessity for which it is the object of the proposal to obviate. This has been shown to be the case wherever the experiment has been tried; and it would, therefore, be unwise to attempt to apply the principle to works of importance, or to those requiring engineering skill. What seems to be a better plan is suggested below.

The importance of irrigation in a tropical climate, and the fact that nearly all irrigation works are in the hands of Government, impose on the State the duty of maintaining them in the highest state of efficiencd, in view to the general prosperity of the country any the security of the public revenues. That the means adopted to this end, under existing arrangements, fail to attain their object will be testified to by every engineer and collector in the service. A lump sum is assigned to "Repairs—Irrigation," the amount having been calculated, not according to the requirements of the works, but according to what could be conveniently spared from other projects. As provincial grants fluctuate with the state of the Imperial exchequer, it comes to pass that the efficiency or deterioration of these life-giving works is dependent more or less on Imperial contingencies, and the agriculturists of Southern India realise the effects of a frontier war by the breaching of their tanks and channels. This is surely an unthrifty policy which, if persevered in, must result in a serious diminution of the public resources. It has been accepted as a general principle that no irrigation project should be undertaken or maintained the income of which is insufficient to meet the charges of interest on capital outlay and of up-keep. But where a work is remunerative to this extent, it follows that only that portion of the income which is in excess of the charges of maintenance is claimable as an asset of the general revenues. This, and nothing more, represents the interest on the capital expended. But as a matter of fact the whole return is swept into the Imperial treasury, and once there it becomes a matter of considerable difficulty to get it out again. As long as the construction and up-keep of lines of communication were dependent on grants from Imperial funds, it was hardly possible to drive 50 miles on end in any direction; and irrigation works, under existing arrangements, suffer much in the same way. The plan that suggests itself as a remedy is not the imposition of an *additional* local cess for the up-keep of irrigation works, which is an Imperial liability, but an appropriation of a portion of the income of such works within certain local limits to be expended on their maintenance and on nothing else. An estimate should be made by the Department of Public Works of the cost of maintaining each project in an efficient state of repair; and that amount, deducted from the enhanced revenue derived from the land permanently improved by the application of irrigation, should be set aside for te purpose. The aggregate of these sums within defined territorial limits—say a taluk—should form the local repair fund for all irrigation works within them, and should be at the disposal of the collector and engineer of the district. The Imperial grant for provincial expenditure would, of course, be *pro tanto* diminished. It is possible, though not probable, that the whole amount might not be expended in the course of the year; but the balance should be carried forward so as to be available for accidents of a serious nature, to which the best constructed works are liable at times. This commends itself as a more practical arrangement than the proposal to reduce the rates now payable by the ryots on condition of their keeping the works in repair, whilst at the same time no enhanced expenditure will be involved.

Lieut.-Colonel Mullins.—Tanks are of two classes: Those the maintenance of which is of great importance to the well-being of the population, because the villagers are dependent upon them for a continued supply of water in their wells or for similar reasons, and is also of importance to the State on account of the revenue dependent on them.

Those of which the continued up-keep is important neither to the people nor the Government.

So far as the available evidence goes, it is tolerably clear that all the tanks of the former class must be under some sort of Government supervision. If such control be withdrawn, they will not be maintained: this is the universal teaching derived from tanks left to the villagers themselves to manage and maintain.

The tanks have, in the systematised method of dealing with them introduced during the past few years, been divided into the following classes:—

(1.) Tanks supplied by rivers and streams;
(2.) Rain-fed tanks in groups;
(3.) Do. isolated.

Under each description or class there are tanks of many sizes. Whatever arrangements be made it will be necessary, in dealing with tanks other than those which are so small and so circumstanced that their condition would not affect materially the security of other and more important irrigation works, to determine what are the essential requirements of those which it may be considered desirable to transfer from the charge of the Irrigation Department. Tanks irrigating less than 50 acres, and which are supplied from a catchment basin of not more than one to one and a-half square miles, might generally without much risk be left to be managed by the villagers without any professional assistance, and without, therefore, the leading features of the arrangements, such as height of bund, length of surplus works, description of sluices, &c., being fixed definitely.

For larger tanks it would generally be needful to prescribe such particulars and to provide for their being promptly attended to under such specific arrangements as might be thought equitable and suitable. Thereafter all tanks so transferred to the charge of the villagers interested would be put in order and maintained by them.

Formerly, it was the custom for villagers to execute from time to time, under the name of kudimaramut, all petty repairs required to village tanks as well as to other village irrigation works. As regards tanks the custom has fallen into disuse, and proposals for its revival and re-establishment on a complete and satisfactory basis have been several times made, but so far progress has not advanced beyond the stage of discussion. The custom requires to be enforced in connection with all irrigation works except the great systems of irrigation which are specially maintained in complete order under departmental arrangements, and interference of any kind with which, on the part of the villagers, within the limits up to which water regulation is in the hands of the canal officers, would not be advisable.

The first and most important step towards reforming the arrangements under which tanks and petty irrigation works are maintained is, therefore, the re-establishment of kudimaramut. It may safely be assumed that, if this cannot be effectually done, it would be useless to discuss what measures could be taken for transferring to villagers the further duty of maintaining generally the irrigation works in which they, as village communities, are primarily interested. This first step taken, however, and got into working order, there would be no difficulty in taking the further step of placing in their hands the responsibility of looking after all works which it may be considered desirable to transfer to their charge, for kudimaramut will not be systematically carried out without inspection, and the staff employed to enforce it would be equally capable of seeing that in all respects the works were kept up in conformity with the general or particular rules laid down for their proper maintenance.

Unless a very radical change were made in the administrative arrangements customary in this Presidency, the supervision of the management of all irrigation works transferred to the charge of the villagers must, it is considered, rest with the Revenue Department. Legislation would be necessary to give power to enforce the obligation; the work would have to be done under the orders of the village officers, who are subordinate to the Revenue officers; and whatever arrangements were made for reimbursing the villagers for the cost of the duty imposed upon them, the settlement would naturally and conveniently be made with them at the time of the annual jummabundy.

Reimbursement or relief should in some form be made or given to the villagers for all work beyond kudimaramut which they may be required to perform. The State is responsible for the water-supply of lands on which a wet-assessment is levied, and consequently for the up-keep of the works by means of which such water-supply is made available. For works in good order a remission of 8 per cent., which is the average assignment for the repair of irrigation works under the present system, might be allowed on its being ascertained that the tanks, &c. were maintained in complete order. For works needing repairs beyond those which might fairly be classed as kudimaramut, grants of from one to five years' revenue might be assigned, according to the present state of the works, to give the villagers a fair start in taking up their new obligations.

The success or failure of the arrangements thus sketched out would depend upon the degree of judgment and extent of supervision exercised by the superior Revenue officers. The inspecting agency must necessarily be of a very subordinate description, for otherwise there would be no gain in any direction to compensate for a loss of knowledge. The inspecting agency would possess considerable power, and unless fully supervised and controlled the remissions of revenue given would not reach those for whom they were intended without material curtailment, while the penalties which the Act empowering the arrangements would necessarily contain would enable inspectors to enforce their demands by threatening summonses. Under the Public Works system a given and definite quantity of work done has to be shown to allow of money being disbursed, and the work is capable of complete check. Under the suggested system there would be nothing but the state of the irrigation work to refer to, and it would be essential to provide for the examination by responsible officers yearly of a fair proportion of all the works in each inspector's range.

It would not be desirable to transfer to the charge of villagers—

(1.) Any large tanks the safety and good order of which may be essential to the security of the irrigation works supplying villages lower down;

(2.) Tanks or other works on which the irrigation of many villages depends.

There is at present no local or other fund from which work not included in kudimaramut could be carried out. An irrigation cess has been suggested by some Revenue officers, but such a cess would not be equitable in the case of villages which have been resettled for a definite term, and cesses are necessarily unpopular. The only case in which a cess is reasonable and equitable is when Government undertake to do work which it has heretofore been admittedly the duty of the villagers to do, but which for any sufficient cause, such as the general interests, it is desirable that they should cease to do. In districts which are about to be resettled it is easy and altogether better to include in the assessment the full demand, and this can, of course, be divided into any number of component parts, with one or more of which Government could deal as might be considered expedient. The people want to know what they have to pay for the occupation of certain land, and they prefer holding at a charge of 5 rupees an acre to being told that they are to pay 4½ rupees, and then having an additional half rupee demanded.

Mr. Price.—I have become, as a Revenue officer, acquainted with four districts, and I have been over every part of two of them. They are Salem, Cuddapah, North Arcot, and Chingleput, and in them petty tanks in the most ruinous condition abound. Government practically leave these irrigation works unrepaired. They have not enough, and, as far as I can see, will never have enough, to allow of their putting them into order. The most obvious way of dealing with this, which is a real difficulty, is to hand them over to the ryots at a slight reduction upon the usual assessment, and to collect this from them, water or no water, leaving them to repair their tank or not as they please. Another way of dealing with the matter would be to cut the bunds of the tanks in several places so as to prevent their holding water and then to give up the land which had been under the tank, and that in its bed, on dry rates, charging these, as is customary, without regard to the season. But to these plans there are the following objections:—

(*a.*) That practically there is not the slightest chance, except under a law which would render it compulsory, of ensuring that the ryots would, if the tanks referred to were handed over to them, keep them in order. A very large number of these small works form links in chains along which are scattered tanks worth keeping.

(*b.*) If all consideration of the up-keep of these small tanks is lost sight of, there will always be the danger of their breaching and carrying away the tanks lower down which have been retained by Government. It is a well-known fact that the breaching of even one

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small tank in a series has led to the destruction of a large number of others in the chain.

From a revenue and irrigational point of view, I would rather not make over the small works to the ryots. It is all very well to make laws and rules on the subject and to direct them to be carefully observed; they will, in practice, not be, and there is not a sufficient staff of officers to enforce obedience.

To the second of the proposals made, the objection to be put forward is an economic one. It is that the small tanks are very often the means of supplying water for cattle and the villagers and for keeping up, during the dry season, the supply of that element in the surrounding wells. It is, therefore, on this ground objectionable to cut the bunds. Otherwise, this would be a satisfactory way of getting rid of the difficulty. The plan would not, in my opinion, involve any loss; indeed, I think that profit would be the result, for the assessment of the land within the tank would quite make up, if not exceed, the difference between wet and dry rates (which former would have to be given up on those fields under it) and remissions would never be allowed. The tanks selected for retention would have a better supply, and the money which is now yearly frittered away, generally as a precautionary measure, in tinkering up the small tanks, would go to the improvement of the larger works. At present no one is contented. Everyone grumbles: the ryot because he gets an insufficient supply of water, and has to pay wet assessment; the engineers because these tanks are always a source of anxiety and trouble to them; and the Revenue officers because the ryots are always crying out for repairs, and because the Public Works Department officers are always patching and producing no apparent increase of revenue.

It will be seen from what I have written above what my views are. The idea of making the ryots, by means of pains and penalties, keep petty tanks in order, is utopian. Theoretically it is possible; practically it is, in my opinion, utterly impossible, unless Government employ a much larger staff of officers than they now do. I would get rid of these small works, once and for all, by cutting the bunds so as to render them harmless and letting the people take the beds up for cultivation. Very many petty works could now be disposed of in this way without risk of harm of any kind occurring in consequence. I would, in the case of all works, no matter whether great or small, insist upon the execution by the ryots of all petty repairs. It is perfectly well known amongst the people themselves in what customary labour consists. It has been an institution of very long standing, and that it has fallen into desuetude has been the fault of the authorities themselves. It could now be easily revived and worked by the Public Works Department through the Revenue officers.

There is no local fund from which to pay for petty repairs, and I do not see how one could be established. I think that by far the simplest way of dealing with the question of repairs to tanks would be to yearly set aside for this purpose a certain proportion of the revenue of each work. I consider that this should come out of the present returns, as the settlement recently introduced decidedly implies, if it does not convey, the agreement that Government will, in consideration of the rates paid, keep the sources of irrigation in order. Adding a tank-repair tax would, of course, not be illegal, but it would hardly be just, and it certainly would be the source of much dissatisfaction.

Mr. Wilson.—Where Government cannot practically carry out the supervision and maintenance of tanks, it would be better to hand them over to the ryots whose lands are affected by them, leaving their up-keep to their self-interest.

At present, in many parts of the country the ryots will not stir hand or foot to stop even a rat-hole. They pay assessment for wet land, and expect Government, which charges for its irrigation, to maintain the work which supplies it.

In the case put in the question tanks are practically *not* maintained; they could not be worse if handed over to the ryots, but would really stand a better chance of being properly kept up than they have at present. This would necessarily involve a reduction of assessment. Government is at present responsible for the maintenance of the tanks; if it declines this responsibility, it must cease to look for the return that it expects for supplying lands with the means of irrigation; the land under a resigned tank is to Government nothing more than unirrigated land; the assessment of it should, therefore, be its proper assessment if classed as dry.

Where much engineering skill is required in a work, the probability is that it will be sufficiently supervised by the officers of Government; it is the great mass of small rain-fed tanks throughout the country that I would hand over to the ryots, and in handing them over I would impose upon them no obligation whatever for the up-keep of the works, the maintenance of which I would leave to their self-interest. It may be said that the tanks would soon be utterly ruined if handed over in this way, because the ryots would never take common action in the matter, and would be always *fighting and quarrelling about it.* What in this respect has been the result of handing over to the ryots the many *ruined* tanks throughout the country? The results of this policy cannot have been bad, or the policy would have been changed. If successful in cases where a considerable initial cost to make the tank hold water at all must be incurred, would it be unsuccessful where the initial cost would be little or nothing? Besides, the question supposed *that* the tanks if not ruined already are in a fair way to being so, since Government can neither maintain nor supervise them.

Mr. Crole.—This question has been raised before (1869), and has been considered and reported on by me as well as several other Revenue officers in Madras. I am quite clear that the project of handing over the care of any of the tanks to the ryots would result in loss to the State and country alike. Interests in villages are, as a general rule, too divided; the art and power of combination has, under our Government, been weakened; the very knowledge of simple hydraulic engineering, for which the Madras ryot was at one time famous, has nearly died out for want of exercise; under our rule the admirable Madras village system has decayed, and economic and administrative conditions have undergone great changes. These and similar causes make it impossible for the present to hope for any success for a proposal which might have worked fairly if introduced 50 years ago. There is a prescriptive duty imposed on every ryot holding land under an irrigation work of contributing the labour required for its protection and slight repair. This used to be called *kudimaramut*, or customary labour. The custom is most unfortunately for the country fast dying out. Its decay dates from the present constitution of the Public Works Department, which, by relieving the Revenue authorities from direct responsibility for and interest in, the repair and up-keep of works, has entailed a vast amount of unnecessary expenditure on the State. If the collector had an engineering assistant, something in the same way as he has a police assistant, there can be little doubt that the present unsatisfactory condition, of the smaller irrigation works especially, would soon cease. It is a suicidal policy to break up the administration of a district into weak and peevish departmental fragments, owning allegiance to as many departmental heads. Kudimamut might still be revived under the plan suggested, and the interests of Government and the ryot, being in the hands of a strong central authority in each district, would be properly conserved instead of being endangered in the interests of so-called departmental independence. Cases proving this are constantly cropping up. A flagrant instance regarding a breached tank, 20 miles from the head-quarters of this district, at this moment condemns this existing system. Touching the question of funds, my strong opinion is

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that these tanks are the most paying works we have. As in the case of all structures, a part of the gross revenue derived from them is properly and strictly debitable to maintenance. It is not, and cannot all be considered pure income. That the duty of maintenance rests on Government, and not on the ryot, is proved by the admission of Government made a hundred times, that when it supplies no water, the ryot is to pay no land revenue. The observance of a plain business-like rule, to reserve each year a percentage of the irrigation revenue to meet charges for accident and wear and tear, would place these works in a sound condition. At present the whole revenue is swept into the coffers of the Imperial Government, and plain duties are overlooked. I am in favour of giving the collector the absolute disposal of the allotment of a certain portion at least of the percentage of the irrigation revenue alluded to. This percentage should not be less than 15 per cent., of which the collector should have 10 per cent. for the maintenance of his irrigation works, the remainder being left at the disposal of Government for special allotment. We all recognise the necessity for spending money to maintain roads in efficiency. It is strange that the far more urgent duty of setting aside a maintenance grant for irrigation works seems still to require demonstration.

Major Montgomerie.—There is no local or other fund from which to pay for work required to be done to tanks, &c. which is more than that ordinarily furnished by kudimaramut, nor does it seem advisable to form such a fund. Once the irrigation works are placed in proper order they can be maintained in that order in the easiest manner by enforcing kudimaramut or customary labour.

All petty tanks the maintenance and repair of which is not profitable should be given up, but they must not be maintained as reservoirs except under some sort of Government supervision.

All tanks or systems of tanks which are worth maintaining must be under Government supervision, and the enforcement of their repair by kudimarimut or by whatever system is decided upon can only be done by the Revenue Department or by giving the executive engineer magisterial powers which would virtually make him and his subordinates assistants to the collector. The engineer would thus secure the full assistance and influence of the Revenue Department in the execution of the work, and he would have much more leisure for the performance of his own professional functions.

By this arrangement one executive engineer would probably be sufficient for each collectorate except in the Godavari, Kistna, Tanjore, and other districts, where the important irrigation works are situated, and which must always necessarily be as much as possible under the direct control of the professional department. The establishment thus set free would form the nucleus of the staff of the Chief Engineer for Irrigation referred to in answer to Question 2.

To further strengthen the hands of the engineer, and to place him in closer relations with the collector, no remissions on account of excess or deficiency of water, &c. should be granted without having been referred first to the Public Works Department for report.

Question 27.—Obligation of Zemindars to maintain Tanks.

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How far do obligations rest on zemindars or other superior landholders to maintain tanks or other irrigation works? Are such obligations properly recognised where they exist, or is any additional power called for to enforce them? Where they do not now exist, are there circumstances or localities in which it would be expedient to impose them on some such basis as that referred to in question No. 26, and if so, on what general system should it be done?

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Colonel Brownlow.—Where the supply of water is less than the demand, distribution by rotation is universally resorted to in India, so far as my knowledge goes, water-course heads being alternately closed for fixed periods of time. This system has marked advantages over the distribution of a diminished volume by proportionate diminution of volume in each water-course. By keeping the water together, instead of frittering it away in small driblets, the proportion of loss by absorption is much diminished, and the irrigation is done more quickly. Half of a cubic foot per second flowing in a water-course will in the same time irrigate much more than four times the area that could be watered by a feeble stream of one-eighth of a cubic foot, and 40 or 50 cubic feet per second can be forced much further down a distributary by closing all water-course heads in alternate lengths of the channel for certain days of the week or month than by reducing the discharge of all water-course heads and allowing them to run constantly.

In Upper India it is the duty of the local canal department to see that the available supply of water is fairly distributed on an existing canal, and I am most strongly of opinion that it should remain charged with that duty.

As regards the most advantageous distribution of supplies available for any future canals, the local government charged with the design and execution of any particular work would consult its revenue department, and follow its recommendations within the limits imposed by physical, agricultural, and economical conditions. In explanation of which limits, I append a copy of some remarks written by myself in this connection on another occasion:—

"To the argument that canal irrigation ought to be restricted to first-class soils and cultivation, in order that Government may obtain the highest possible returns for its expenditure, I reply that, even supposing a sufficiency of first-class soils and cultivation to use up all the water available, both physical and agricultural considerations forbid our leading the water about in search of the best land and the highest market. Canal channels must follow the ridges of the country, and the water must be distributed within a reasonable distance from the source of supply, or great waste from absorption will ensue, while the best land and highest cultivation may lie a long way from the head of the canal, or from the ridge occupied by a canal channel. Confining canal irrigation to first-class land would interfere most injuriously with rotation of crops and tend on the whole to impoverish the soil; for the cultivator would be prevented by the high water-rates from taking his best crops and cultivation round his farm. On this subject I cannot do better than quote Mr. Alan Cadell: 'To charge high 'rates, with the special object of restricting cane and 'cotton to a very small area of highly manured land, 'would be to attempt to change the system of agri-

‘culture in the Upper Doab. A man might, perhaps, grow finer crops if he restricted the manure at his disposal to say one quarter of his land; but the average would be less good than at present, when the jât of the Upper Doab takes his sugarcane round the whole of his irrigated land, and manures the whole of that land once in every three, four, or five years, instead of half of it only in two.’”

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Mr. Sullivan.—The obligations of zemindars in this respect are of course limited to the works on their own estates, and as there is no law to enforce their performance they are often neglected. For the sake of their tenants and for the protection of interests beyond the boundaries of their estates which might be injuriously affected by the breaching of tanks and channels, it seems desirable that the performance of this most important duty of a landlord should be made compulsory by law. The arrangement suggested in the preceding question would not be applicable in this case, as the State is under no obligation to maintain the irrigation works in a zemindari.

Lieut.-Colonel Mullins.—As far as can be ascertained, zemindars are under no direct obligation to Government to maintain works of irrigation. As a rule, the villagers are expected to maintain them, and it is only occasionally that special assistance is afforded them, *e.g.*, when a flood has occasioned damage evidently beyond the means of the villagers to repair. It does not seem to be usual for zemindars to assign any fixed proportion of the revenue to the up-keep of irrigation works. There are no data for comparing the present state of the works with their condition at any former period That condition is not what it should be, but the same may be said of a large proportion of the irrigation works of Government villages.

Major Montgomerie.—The zemindars can hardly be said to be bound by any obligations to maintain tanks and other irrigation works in a really efficient state.

In the first place, their negligence cannot be checked until after the event, and in the next place after a disaster has occurred it is not difficult to make out that the cause was beyond human control or at all events what could reasonably be required of the proprietor.

Lieut.-Col. J. N. Hunter.—It would be very desirable that the duties of the dasbundumdars should be defined, and whether Government have not a right to say to any dasbundumdar who holds land free on condition that he keeps the Government tank in repair, “Our contract is now at an end; we resume our tank, “and will repair it ourselves; you will be charged “rent for your land, and have no further duties in “connection with the tank repairs.”

Major Vibart.—I believe zemindars are obliged by their shasanoms to maintain their tanks in an efficient state, but I do not think they at all properly recognise their duties in this respect. I think their duties should be enforced by passing a law that when Government were compelled to interfere the zemindars should pay double the cost of the repairs which their neglect had necessitated.

Mr. Wilkinson.—I know of no obligations which zemindars, mutadars, or inamdars are under to maintain their tanks and irrigation works in order, and the consequence is that they seldom are kept in order. I think it is highly desirable to impose on all superior landholders not holding under a sanad-i-milkiat istimrar or permanent sanad the obligation of keeping all their irrigation works in proper repair; but I cannot suggest on what general system such obligation should be enforced.

Mr. Turner.—No obligations, other than being sued in the civil courts for damage done, rest, so far as I know, on zemindars or other superior landholders to maintain tanks or other irrigation works, and I have now before me (Ramnad zemindari) an instance in which the zemindars have neglected the repairs of their tanks for years until the whole country is well nigh ruined. Such a state of things must, it appears to me, be remedied. The wretched state to which the misrule of the zemindars has reduced Ramnad is something appalling. While the rest of the country has been progressing Ramnad has positively retrograded. To quote from Mr. Boyle's Report on the estate, dated 18th September 1873: “Not only is the country in “the condition in which men depict India 50 years “ago in the utter absence of made roads, but this “event has been intensified tenfold by the utter “neglect of all irrigation works, tanks, and channels “for years.” At the present minute there is not a single made road in the zemindari along which traffic can pass during the wet months with safety, the revenue system is an anachronism and must be remodelled, and the revenue servants are still little better than a swarm of devouring locusts. Fortunately, we have a long minority of 10 years before us, and we can do a great deal in that time, but there ought to be some means of rendering the former state of anarchy impossible for the future. I would suggest that a clause might be entered in the “Form of permanent sanad,” rendering it obligatory on the part of the zemindar to maintain his tanks or other irrigation works in good repair. He should also be held responsible that his administration be so ordered as to favor the progress of the estate and well-being of the ryots.

Mr. Foster.—No obligations rest on zemindars or other superior landholders to maintain tanks or other irrigation works. I must certainly think they ought to be required to keep them in repair. The land forming the bed of the tanks was excluded from consideration when the permanent settlement was fixed; but now the rule is that this land is the absolute property of the zemindar to do as he likes with; he can build on it, or he can cultivate it without interference from us.

I suppose now in the case of tanks which zemindars have put to other purposes, they must be left as they are; but in the case of those that were excluded from the permanent settlement zemindars should be compelled to keep in order all tanks which are not irretrievably ruined; but in consideration of this being a somewhat new duty imposed upon them, I think Government might give them some assistance in money for the first repairs, even though all the direct benefit accruing from the repairs goes to the zemindars.

I would allow no tank that is not now irreparably ruined to be allowed to fall out of repair, unless an engineer officer should certify that its place had been properly taken by some other means of irrigation. If the zemindars fail to carry out the necessary repairs to the tanks, I see no objection to Government carrying them out at the zemindar's expense. If it were thought that this would be in contravention of the agreement between Government and the zemindars at the permanent settlement, Government could acquire the half-ruined tanks by the Land Acquisition Act, repair them, and charge for water anyone who wants to take it. Water is absolutely necessary for the country, and it is impossible that anyone can be allowed to exercise any private right even, with regard to it, to the injury of the community, so long as he does not suffer much injury himself.

QUESTION 28.—MADRAS ACT NO. VII. OF 1865 (WATER CESS).

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What are the rules made under Madras Act No. VII. of 1865? *Give a statement of the works to which this Act has been applied, and what is the revenue realised by means of it? Give an illustration of the cases in which exemptions are granted under section* 4 *of the Act. What is the nature of the receipts entered in the Miscellaneous Land Revenue under the head "Cess for repair of tanks?"*

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Mr. Sullivan.—(*a*) and (*b*).—These will be found printed in Appendix C. They are applicable to all the districts in the Presidency with the exception of those noted in the heading of the rules and to all lands not permanently classed as wet. In the excepted districts, however, the same system obtains with modified rates, and the amount of water-rate realised in them is, therefore, included in the following statement. It must be borne in mind that this merely exhibits the additional revenue due to irrigation derived from lands on which the land assessment is a charge distinct from the water-rate, and is exclusive of the revenue derived from irrigated lands charged with a consolidated wet assessment:—

STATEMENT of Irrigation Revenue derived from Lands not bearing a consolidated Wet Assessment.

Districts.	Water Rate	Second Crop Assessment.	Total.
	Rs.	Rs.	Rs.
Ganjam - - -	26	—	26
Vizagapatam - -	2,377	—	2,377
Godavari - - -	10,20,878	4,222	10,25,100
Kistna - - -	6,98,672	373	6,99,045
Nellore - - -	17,529	10,646	28,175
Cuddapah - -	23,715	42,682	66,397
Bellary - -	39,217	76,053	1,15,270
Kurnool - - -	27,497	29,663	57,160
Madras - - -	—	—	—
Chingleput - -	43,818	51,755	95,573
North Arcot - -	64,541	35,410	99,951
South Arcot - -	2,48,922	69,077	3,17,999
Tanjore - - -	1,44,963	86,407	2,31,370
Trichinopoly - -	38,344	92,667	1,31,011
Madura - - -	3,782	31,931	35,713
Tinnevelly - -	3,622	27,921	31,543
Coimbatore - -	16,646	302	16,948
Nilgiri - - -	—	—	—
Salem - - -	5,279	—	5,279
South Canara - -	—	—	—
Malabar - -	—	—	—
Total - -	23,99,828	5,59,109	29,58,937

(*c*.) The exemptions are confined to permanently settled estates where lands previous to the construction of the works were classed as wet and charged accordingly when the peishcush was fixed, and to inam lands where irrigated land formed the original grant. Such lands coming under the influence of a work subsequently constructed are allowed the use of water free of charge.

(*d*.) The contribution of this cess is almost entirely confined to one district. The total amount collected in 1875–76 was only Rupees 3,700, of which nearly Rupees 3,000 was contributed by the district of Chingleput. This is evidently a relic of former days when Public Works Department's budgets and estimates were unknown and the revenue of the State was paid in kind under the "warum" or sharing system. At the time of the harvest the out-turn of each holding in the village was stored in certain convenient localities, and no one dared to remove it until the officers of Government came round. Then, according to a system varying in different parts of the country, but well understood by the village communities, commenced the distribution of the shares. Part of the gross produce was set aside to recoup the ryot for the expenses of cultivation, part for the remuneration of the village servants, part for the pagoda and religious services, and amongst other items a portion was allotted for the repairs of tanks and channels. In some places this was added to the sirkar share when the final division of the net produce took place, the State nominally undertaking the repairs, in others it was handed over to the heads of villages for the purpose, but as a matter of fact the irrigation works of the country benefited but little whichever system prevailed. The collector of Coimbatore reporting on the latter stated as follows:—"This system appears to have been most fallacious and unprofitable, as on the assumption of the province by Government the tanks and channels were found in the utmost state of disrepair and the cultivation proportionately deteriorated." The cost of maintaining irrigation works in an efficient state of repair having, ever since the commencement of British rule, been accepted as a charge on Imperial revenues, there can be no question but that this cess should be done away with in the few districts where it now survives.

APPENDIX C.

RULES for the levy of Water-rate in addition to Land-assessment on all lands not permanently classed as wet in all districts (except Ganjam, Tanjore, Madura, Tinnevelly, Malabar, South Canara, and the Nilgiri Hills) when water is supplied from a Government source of irrigation.

I. All dry lands temporarily cultivated with wet crops shall in lieu of any system now in force pay a fixed water-rate on the following scale of standard rates. Where water is raised by mechanical contrivances the rates shall be reduced one-fourth, and in deltaic tracts when water is drawn from drainage channels one-half.

Standard Rates.	First-Class Tanks, River and Spring Channels.			Second-Class Tanks, River and Spring Channels.		
	Rs.	A.	P.	Rs.	A.	P.
a. Water-rate for a *single* wet crop raised on dry lands, per acre.	*4*	*0*	*0*	*3*	*0*	*0*
b. Second crop on the same land, per acre.	2	0	0	1	8	0
c. For sugar-cane, betel, cocoa-nuts, plantains, &c., requiring water longer than an ordinary wet crop, per acre.	6	0	0	4	8	0
d. For dry crop watered, whether first or second crop, per acre.	2	0	0	1	8	0

1. This rule does not apply to North Arcot or South Arcot, which have special rates uniform throughout the district, nor to the delta tracts of the Godavari and Kistna district.

2. Rate *b* does not apply to Cuddapah.

3. In Kurnool, rate *d* to be reduced one-half.

II. When a portion (or portions) of a field is irrigated, and the field is not more than half an acre in extent, the charge shall be calculated on the actual extent of the field.

When the field is larger than half an acre, the extent irrigated must be carefully measured and the

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charge shall be made by the half-acre, subject to the limitation that more than the recorded extent of the field shall not be charged for.

For instance, if 1·5 acres are irrigated, the charge shall be the rate for three half-acres; if the extent irrigated is 1·55 acres, the charge shall be the rate for four half-acres, provided that, if the whole field be less than four half-acres, as for instance 1·75 acres, the charge shall be the rate for the recorded extent of the field.

III. The collector has power to impose prohibitory rates whenever water is taken without permission.

IV. The above rules are applicable to all Government sources of irrigation the supply in which is at all regular and to be depended on. Simple *jungle* streams which only receive a casual supply may be utilised, as hitherto, without charge.

V. No Government water is to be taken under these rules without the express sanction of the head of the village or of the Department of Public Works officer, when the works are in charge of that department.

N.B.—These rules do not apply to second crop raised on *wet* land, for which the usual charge (generally half the single crop assessment) will be made.

IV. Qn. 29.

QUESTION 29.—DISTRIBUTION OF WATER WHERE SUPPLY IS DEFICIENT.

How has the distribution of water been fixed where the supply is less than the demand? Do customary or other established rights interfere with the extension of irrigation from any Government canal, and if so, where and to what extent, and what remedy should be applied? Is it the duty of any one to see that the available water is made use of to the best possible advantage for the community as a whole, and on whom does the duty fall? Is there any difference in the system of supplying canal water to lands under ryotwari settlement and under zemindari settlement, where the two exist, and what is it?

Punjab.

PUNJAB.

Captain Ottley.—The answer to this question involves the consideration of two perfectly distinct cases which may arise in practice. There is first the case in which the volume of water in the projected canal is known to be insufficient for the requirements of the whole tract of country through which it will pass. Under these circumstances the first action is to eliminate all portions of the country (if there be any such) which do not actually stand in need of canal irrigation. The conditions may be stated to be, (1) a rainfall of more than 20 inches, and (2) a spring level less than 25 feet below the natural surface of the ground. Where these conditions exist, it is considered that the crops can be assured by well irrigation, and that there is no necessity for supplying these areas with canal water.

The Kasur and Sobraon branches of the Bari Doab Canal may be instanced as a case in point. The proposed supply was insufficient for the whole tract of country through which these branches were to run, and orders were therefore issued that irrigation was not to be provided for the upper portions, where the average rainfall was more than 20 inches per annum, and the depth of water in the wells was less than 25 feet.

On the Western Jumna Canal also it is proposed to restrict the supply to all the "khadir," or river lands, where the depth to water is very small (in some cases not more than 6 to 10 feet), and to carry the canal water past these tracts to the drier regions further down, where the wells are 50 and 100 feet deep, and where also the rainfall is very small.

These tracts having thus been eliminated and the distributaries lined out, the limit of irrigation is fixed at about 2 miles on either side of these channels, because it has been found that water-courses carried further than this are more difficult of supervision, and lead to waste of water. This limit of 2 miles is fixed by section 31 of Act VIII. of 1873, and Rule 6 of the Rules under that Act, where it is enacted that water shall not ordinarily be granted to lands where the length of the water-course from its head to the point of contact with the fields exceeds two miles.

Lastly, as regards villages within this limit, the rule is to grant only sufficient water to enable the people to irrigate a certain proportion of the village lands. This proportion is, of course, a variable one, depending on many considerations; but it is now usually fixed at from 20 to 25 per cent. of the culturable area.

The second case, referred to above as one that might and does not occur in practice, is that of a short supply in the canal during an irrigating season, that is, when the volume of water available for distribution is insufficient to meet all the requirements of those to whom outlets have been allotted. In this case, divisional canal officers are empowed, under section 32 (*a*) of the Act, and Rules 15 and 16, to impose closures (locally known as "tátil" or "bandi") on such water-courses as they may deem right.

The Act allows these closures to extend to 10 days, but, as a matter of fact, the practice is rarely, if ever, to extend them beyond four days at the outside. The orders for these closures are notified either (*a*) by a notification or (*b*) by a special order, and must be in writing under the hand of the executive engineer, a copy being conveyed by the Canal Establishment to each village concerned, and delivered to the patwári (village accountant, or, in his absence, to any lambardár (headman of the village). The receipt of each person who receives such an order is taken and filed in the Canal Office; and it is by law the duty of the patwári and lambardár who receives the notice to affix it at once in a conspicuous position in the village, and to make its purport generally known.

There is probably no other portion of a canal officer's work which demands such experience and care as the proper regulation of these closures, whilst their due enforcement, especially in seasons of drought, can only be ensured by the exercise of great vigilance and firmness.

On this subject, the late General Greathead wrote some years ago as follows:—

"It is a universal rule of experience that a high standard of irrigation from a given amount of water is never attained without direct superintendence of an European officer. It is only by unremitting energy in riding about the country and seeing with his own eyes that the periods for taking water allotted to different water-courses are not overpassed, that the officer in charge of irrigation can ensure the fertilisation of distant lands; and no one can do this duty so well as a young Englishman."

By means of these closures the supply of water is reduced as far as possible rateably, so that the available supply may be distributed to the best advantage of the community at large.

NORTH-WESTERN PROVINCES.

CH. IV. QN. 29

NORTH-WESTERN PROVINCES.

Mr. C. C. Anderson.—(1.) Rateably. (2.) No. Broadly speaking, irrigators have no right to the waters of the canals. There is a clause in Act VIII. of 1873 which debars the acquiring of right to irrigation under the present system. (3.) The canal officers of all grades. (4.) None known.

BOMBAY.

BOMBAY.

Mr. Hughes.—When the supply is less than the demand, water is distributed by "wara" or turn, that is, on the horary principle. It is the duty of the canal officer and canal subordinate to see that the available water is made use of to the best advantage for the community as a whole. The canal rules give the canal officer powers which, though not legalised, are generally exercised for preventing waste, &c.

Colonel Anderson.—In all old works the people manage the distribution of water themselves. As a general rule, every cultivator holds more land than he irrigates, and there is nothing to prevent his extending his irrigated area as far as the supply of water will admit. Each person has certain defined rights as to the time during which he may enjoy the flow of water from the tank channel; and self-interest will induce him to make the most of it, as far as his means will admit. For it must always be remembered, that water is not the sole need for irrigated cultivation, which requires much more labour and more manure than unirrigated, and one, or both, may not be procurable, or only to a partial extent.

Mr. Ramsay.—As stated above, the water supply is regulated by ancient custom, and very few disputes arise on the whole. Government canals, within my experience, have only been started where no other such works previously existed; or else the action of Government has taken the form of repairs to existing works or of storage tanks to improve the existing supply. In either case, the actual distribution of water has remained, as before, with the people themselves. In most villages where there are canals there is a hereditary officer termed a "patkuri," who regulates the supply of water. He is supervised by the patel and those who have an interest in the water. The system works far better than that of our Government canals under paid subordinates of the Public Works Department.

The amount of land that can fairly be irrigated by the existing supply of water has been calculated by the Revenue Survey Department. The whole of this area has been subjected to water-rate assessment, and Government need look no further. Each man looks after his own rights, and, as stated above, very few disputes arise on the whole. There is no occasion for any change of system. No man can take water to which he is not entitled, as the other villagers would not permit it. Government gets the full value of the irrigated land in the shape of enhanced revenue.

MADRAS.

MADRAS.

Lieut.-Colonel Mullins.—Ordinarily the area to be irrigated is at least roughly limited to the supply of water supposed to be available, and this area is, in the case of old tank and channel irrigation, termed the ayacut. When the supply is less than the ayacut requires, the distribution is either regulated by local custom, or, where none such exists, the more influential landholders appropriate the water, and the less influential leave their lands waste.

No distinction is made between lands under ryotwari and zemindari settlement in supplying water from canals. Canal officers are guided solely by areas in apportioning the supply.

QUESTION 30.—MANAGEMENT OF IRRIGATION BY PRIVATE AGENCY.

CH. IV. QN. 30

Is there any special difficulty introduced into the spread of irrigation by the intervention of the agency of a company in the management of a canal, and how could such difficulties be best overcome?

BENGAL.

BENGAL.

Colonel Haig.—No company will in future undertake to make a canal unless profits are certain. If so, Government, which requires all the profits it can get, ought to carry out the work, and not a private company. My impression is that the intervention of a company in Orissa caused the greatest difficulties, which could never have been satisfactorily met.

MADRAS.

MADRAS.

Lieut.-Colonel Mullins.—Only one company, the Madras Irrigation and Canal Company, has been in existence in Southern India. Its intervention has been attended with numerous difficulties, which are due to many causes, among which conflicting interests, an assumed necessity for protecting the ryot or user of the water at the expense of liberty of action on the part of the Company, complex rules which are almost unavoidable when two independent authorities have a voice in all the arrangements, are among the most prominent. It is questionable whether these difficulties could be overcome otherwise than by selling water

H. IV. Qn. 30.

MADRAS.

by volume, and to introduce such an arrangement is not easy, first, because the ryots have no knowledge of quantities; secondly, the volume needed for different soils and for different crops is very variable, and its value under such circumstances would differ widely. There is no advantage in employing the agency of a company, and there are many and important disadvantages. If a company desired nothing but to make its canals beneficial to the population, it would not be a good instrument for the carrying out of irrigation projects, because its obligation cannot be made sufficiently definite to remove all occasion for difference of opinion as to whether they had been fully performed.

H. IV. Qn. 31.

QUESTION 31.—DIRECT AND INDIRECT RETURNS.

In reckoning the return obtained from the outlay on canals or other irrigation works, is full credit given them under the existing system of accounts? Where separate water-rates are charged on the cultivators, is the indirect profit obtained by the increase of land revenue properly taken into account? Where there has been no distinction made in the payment to Government between the charge made as land revenue and that for the supply of water, is the canal revenue fairly estimated at present, and if not, how do you think it would best be reckoned?

PUNJAB.

PUNJAB.

Captain Ottley.—Full credit is *not* by any means given to any of the canals in the Punjab. In no instance is the so-called indirect profit credited to the canals in the Imperial accounts, although the department is permitted to show these amounts in statistical returns as part of the benefits derived from the operation of the canals.

This applies not only to cases in which these amounts are assessed by the civil officers, but also to all the sums which are actually assessed by canal officers themselves. Thus the whole of the "water-advantage rate" on the Bári Doáb Canal (which is assessed by the canal officer and amounted in 1877-78 to Rs. 2,00,083) is credited in the Imperial accounts as land revenue. Again the whole of what is called the "fluctuating land revenue" in the Montgomery district, and which was assessed by the canal officer in 1877-78 at Rs. 85,894, is shown in the Imperial accounts as land revenue and is not credited to the canals.

Similarly on the Western Jumna Canal the whole of the owner's rate, although it will be assessed by the canal officers, will, unless a change is made in the system of accounts, be shown as land revenue in the Imperial accounts.

It may be as well to add that even the correct share of the revenue which, as has been mentioned above, is permitted to be shown in statistical returns, has not all along been given to the canals, but endeavours have been and are still being made to rectify the omissions. Much has already been admitted, but there are still some items under consideration and under process of adjustment by the Financial Commissioner.

The contention, however, is that all these sums (by whatever name they may now be called, whether "water-advantage rate," "owner's rate," "enhanced land revenue," or "fluctuating land revenue") which are at present only shown in canal statistical returns, and which are really credited in the Imperial accounts as land revenue, should properly be credited in these accounts as canal revenue, in the same way that the actual water-rates or "occupiers' rates" are credited.

But even supposing this to be done, the result will not even then correctly show the true credit which should be afforded to the canals.

Thus in most of the districts of the Punjab proper there are large areas of culturable waste land, the property of Government, which now bring in nothing in the way of revenue, except the small amount which can be realised from a grazing tax on cattle fed in them; there are also other tracts on which, owing to the small rain-fall and the great depth of the wells, only a very light assessment can be made.

On the opening of a canal not only is a large portion of the waste land brought under irrigation, and assessed with land revenue at irrigated rates, but population increases, and a further portion of the waste is opened out for the cultivation of the poorer cereals and pulses dependent on the rain-fall, and all these tracts are assessed at the next settlement at unirrigated rates at a far higher figure than the old grazing tax; and whilst no portion of this would be credited under the present system to the canal, it is clear that but for its presence no such assessments would have been possible.

Both these cases have occurred on the Bari Doab Canal in the Lahore district. Large tracts on which only a few stunted trees grew before the canal was opened are now covered with crops, and besides this a very large area of land the cultivation of which was formerly precarious has now been secured, so that a large increase in the assessments of the district has been made possible by the introduction of the canal.

In the interval between the first and second settlements the population per square mile increased from 107 to 214, and, although this may not have been entirely due to the increased cultivation which was rendered possible by the canal, still there can be no reasonable doubt that it was greatly aided by it.

In such a case as the Bari Doab Canal, where improved communications both by rail and road, the benefits arising from the establishment of a strong government, the large expenditure on other great public works, and other causes have doubtless had great effect in increasing the general wealth and prosperity of the district, it would be very difficult, perhaps impossible, to determine with any degree of exactness the particular share which is due to the introduction of the canal.

There are, however, many other cases in which practically the whole of the increased prosperity would be attributable to the canal alone.

For instance, in such a case as that of the country between the rivers Ravi and Chenáb, for the irrigation of which a canal has been designed, the whole increase of revenue which might accrue to Government after the introduction of the canal would be as fairly a canal asset as the revenue derived from the mere water-rates, and this because nothing but the amount now levied could be raised without canal irrigation.

In the two districts through which this canal would pass (*viz.*, the Gujránwála and Jhang districts) there are about 2½ million acres of unappropriated waste, the property of Government; and the rain-fall is so small, and the wells (where they exist) so deep,

Punjab.

that any extended cultivation without canal irrigation is out of the question.

In a case of this sort the only way of clearly establishing the true benefits of the canal would be to take the revenue assessed on the tract through which it was to pass previous to its construction, and to credit the canal with every rupee by which that revenue might subsequently be increased. Till this is done the true results of irrigation in such tracts will never be known.

NORTH-WESTERN PROVINCES.

North-Western Provinces.

Colonel Brownlow.—So far as I know, full credit is given under the existing system of accounts to canals and other irrigation works in the North-Western Provinces and the Punjab for both direct and indirect returns upon the capital outlay. I am not in a position to give an opinion on the sufficiency of credit allowed in Bengal. In Madras, while credit is often taken, in the vaguest manner, by enthusiastic engineers, when writing or speaking on the subject of canals, for land as well as water revenue dependent on the works, the tendency of the Madras Government in Revenue Department, when driven to show what has really been the result of the large irrigation works, is decidedly to under-estimate the water revenue.

In Bombay and Sind, so far as I know, full credit is given to all irrigation works for the results fairly due to them.

Mr. C. C. Anderson.—(1.) Yes. (2.) Yes; but the returns for the entire province are not quite complete. (3.) Such a condition does not hold in the North-Western Provinces.

BENGAL.

Bengal.

Colonel Haig.—In Bengal full credit is given for all *direct* canal returns, but not for the indirect, which it is very difficult to estimate.

BOMBAY.

Bombay.

Mr. Hughes.—My reply is "yes" to each of the questions under this number.

Colonel Anderson.—This is in the main an Irrigation Department question. As regards the latter part of the question, there can be no difficulty in Bombay in ascertaining the portion of the revenue due to water on irrigated land apart from that on the soil alone, since the means exist for at once ascertaining in reference to any field what the assessment of it would be if it was cultivated without irrigation as simple dry-crop land, exactly in the same manner as the assessment of any dry-crop field in the same village is ascertained, the same soil data being recorded for each.

The above is the last question of Chapter IV., but a few points occur to me which, though not specifically touched upon in any of the questions, are within their general scope and, therefore, on them I desire to offer a few remarks.

The indirect advantages of irrigation are more than once referred to without any specific mention of what they are.

It has often been remarked, and even long ago before the survey settlement, that a village in an essentially dry-crop country which happens to have a good proportion of irrigated land, whether from well or tank, has more backbone in it than a purely dry-crop village. This applies not only to Government villages but to inam villages. The people are generally better-to-do. This cannot be solely from the superior productiveness of the land, for an additional assessment is paid on irrigated land, which, before the survey settlement, in Government villages, though very unequally imposed, was very generally pitched at a very high rate, and in inam villages not under the survey settlement is always so. Much is, I believe, due to the greater certainty of return, and to the habit of pretty continuous labour, rendered necessary by the use of irrigation. The habits induced by the necessities of irrigation are more or less extended to all other lands, to the great benefit of the cultivators.

Another undoubted indirect advantage is the certainty of being able to procure fodder for cattle in even a season of almost utter failure of rain. No season, not even that of 1877, in Kaladgi (always a district of limited rainfall), is utterly without rain; but it comes when it is not wanted, and may do little or no good except so far as it may supply means of irrigation. The year 1877 happened to be the second of short rainfall, and, partly from that cause and partly from the nature of the fall which did occur, the ground at a very few feet below the surface was most unusually dry. A fall of several inches in a few hours will do little or nothing for the wells, while the same fall spread over days instead of hours will do much. A heavy fall spread over a short time does, however, greatly affect the supply of water stored in the sandy beds of rivers, and even when the wells proper are dry those well-like constructions (called boorkees) common in the Deccan on the banks of streams will be worked with success. Villages in Kaladgi last year with many boorkees obtained a sufficient supply of fodder to save all their really good cattle.

Beyond doubt, therefore, the practice of irrigation does increase the wealth of the people and tend to preserve that wealth from the evil effects of a bad year. The wealth of the people is the wealth of the Government, and, therefore, it is not advisable to calculate returns on too close figures when considering the propriety of sanctioning money for the extension of irrigation. Four per cent. is looked upon as the natural minimum return for money invested by the State. But as regards money expended on irrigation, Government should be, in certain districts especially liable to drought, content with a certain return of even 2½ per cent., and trust to the difference being made good indirectly; first, by the increased ability of the people to consume other tax-paying commodities; and secondly, by the extra security given to the ordinary land revenue by the general improvement in the condition of the people; and lastly, by the obviation to some extent of the possible necessity for Government incurring heavy expenditure in exceptionally bad years.

The next point to which I would advert is the kind of irrigation work which would probably be most successful in the Deccan, a country in which the population is not dense, neither are extensive areas suitable for irrigation to be found within a small circle, conditions which evidently point to spreading the possibility of irrigation over a large area and against concentrating it.

IV. Qn. 31.
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Bombay.

There are two forms of large works; 1st, dams across rivers with channels leading away from the river on one or both banks. These works have the advantage of absorbing but a small area of useful land, and of ordinarily being certain of a supply of water. The objection is that they are exceedingly costly, and, in order to diffuse the irrigation over an area sufficient to contain the labour and land to turn it to account, an immense length of channel must be constructed.

The second class of large works are storage tanks, which may be fed by a channel from a river or be fed by damming up a stream in an appropriately situated valley. The objections to these works are, first, that they are very costly; secondly, that they invariably cover a very large area, and that, in most cases of the best land in the country, land which would in any ordinarily bad year give some crop; thirdly, they are open to the same objection as channels from rivers in regard to the great expense of making their subsidiary channels of a length to sufficiently diffuse the irrigation power. No large work in the Deccan has up to the present time ever paid, and the annual accumulation and addition of interest to the original capital must be fast putting them into a worse financial position.

The kind of irrigation which is in every respect most liked by the people is that from wells and boorkees or well-like erections on the banks of streams. The latter are the most certain, as the beds of streams will hold water in years when the wells are dry. One "mote" or waterbag is reckoned as capable of irrigating five acres of ordinary crops, supposing the lift of water to be of ordinary height, say, not exceeding six or eight yards. At present the people can obtain fund for sinking wells from Government under the Land Improvement Act; that Act, however, is, I believe, but little operative, from reasons readily to be appreciated.

It appears to me that advances might be made for sinking wells by mutual agreement between the cultivator and the Government, the latter advancing the money and the former agreeing to pay a certain sum annually as a rent-charge on his land. My impression is that Rupees 12 a year would be readily paid on a well which would water from four to five acres. Such a well might in most situations be constructed for Rs. 200 to Rs. 300, on which Rs. 12 would give from 6 to 4 per cent. return. This sum might be secured on the land as a first charge, similarly to the Government revenue. The payment of return for expenditure on works of this nature would be immmediate, the benefits of irrigation would be diffused over as wide an extent of country as possible, and the greatest good would be done for the smallest expenditure. Five hundred wells would be got for 1 to 1½ lakhs of Rupees, which would irrigate 2,500 acres of land. In no way could the irrigation of such an area be secured at any approach to that expenditure from large artificial works.

The sole difficulty, and no small one, would be in the construction of these wells. The people could not be trusted with the money and the construction themselves. The work would require to be carried out under close supervision. As regards the comparative ease with which water is obtained from these and from large artificial works supplying water by flow, the ryot would prefer to have water under his own control, to use when he chose by lift, to having it supplied by natural flow at any rate of assessment at which he is likely to get such irrigation. If such wells could be constructed and a payment on the capital expended of 5 per cent. secured, 3 per cent. might be considered as interest and 2 per cent. as the sinking fund to pay off the original expenditure, which would afford a far more certain return for money directly and indirectly than is likely to be afforded by any large works whether tank or channel in the Deccan, and do far more immediate as also, probably, permanent good. The great advantage would also be obtained of avoiding the investment of large sums in one locality, any adequate early return on which must be a matter of doubt. *A well or boorkee could be constructed in a* very few months, and the next year should see the return for the capital expended coming in without difficulty or any administrative supervision of the area irrigated.

I am fully sensible of the difficulties in the way of properly supervising the construction of a great number of small works. Still, by dividing the tracts to be dealt with into small circles, this might probably be got over. If the works were well and solidly constructed in the first instance, large repairs need not be necessary during a long lapse of years. Small repairs should be executed by the landholder. I would provide him with the first work and leave him to keep it up without further aid from the State.

It may be said that the people would refuse to accept such works and to pay what would, in fact, be an additional assessment of Rs. 2 to 3 an acre. Irrigation would be supplied to them in the form they are most accustomed to; if they would not accept this, it appears to me hopeless to expect that they will accept irrigation from large and expensive works, which would, to make them in any way remunerative, require average rates to be paid of, probably, at least treble the above amount, accompanied with the great objection in the ryot's mind of not having the water under his own control.

As regards the comparative advantages of irrigation works and railways as preventatives of the effects of famine, the following appears to me to be the state of the case.

Production even in the worst districts is in ordinary years much in excess of the requirements of the existing population, and, with the improvements in cultivation which time and increased population will bring about, will meet the wants of a considerable addition to the present population without the aid of extensive irrigation. There is, therefore, no immediate need for adding to the produce of the country generally or of these bad districts specially.

Railways will enable surplus produce to be exported to a much greater extent than the present communications and means of carriage will allow; even the worst districts freely produce exportable articles, some wheat, oilseeds of several kinds, besides the commoner kinds of grain, which, with cart carriage, will not, from its bulk in proportion to value, pay the cost of any distant export. Oilseeds especially are in constant demand to an unlimited extent for export to Europe. An improvement in railway communication would, therefore, immensely increase the wealth of the people and enable them to resist hard times to an increased extent.

Railway communication would also supply an existing want, while irrigation would be a doubtful remedy, as it is very uncertain how far the people are in a position to avail themselves of it when offered, and therefore, how far the construction of large works would in most situations approach to repaying the State the heavy cost of construction. It would be hard to find any reasonably well-selected railway which would not pay 2½ per cent. net at an early date after construction. I think no large irrigation work in Western India has ever yet given such a return or holds out any prospect of doing so at any early date, notwithstanding that some of the few constructed are in exceptionally favourable situations.

When fame was actually on, irrigation would do comparatively little to obviate the pressure as regards human food; the extra quantity locally produced would affect prices little, though the supply of fodder would be of inestimable advantage towards saving cattle. On the other hand, with a railway within 40 or 50 miles of any place, and with a good sound road passable in all weather within 12 miles of every place, it would be absolutely impossible for the extreme pressure of famine to exert itself, as prices must be kept down.

There is no want of food in the country for a much larger population than it carries, and a general short supply is practically impossible, but the food is not at all times in the place where it is wanted; it would

Bombay.

appear to be the evident primary policy not to increase the quantity of food, but to increase the means of transfer from one part to another. If, in providing those extra means of transport, we not only obviate the worst effects of occasional famines, but also foster the general wealth of the country in ordinary years, we are adopting two certain modes of averting the worst effects of famine.

It may be said that many of these proposed inland minor railways would pay little beyond the cost of working. Even if this proved to be the case it would be no argument against them compared with irrigation works. In the first place it remains to be seen if very large irrigation works will pay more, and secondly these minor railways would act as feeders to the main trunk lines under Government guarantee, and a considerable proportion of what the minor railways carried, at perhaps little beyond the cost of conveyance, would be afterwards carried for a much longer distance over the trunk lines, to the great benefit of the Government treasury.

The matter may be summed up as follows: We have already, somewhere or other, always more produce than we require for internal consumption, and more than we can find the means of exporting. Before taking measures to increase the quantity of that produce, primarily turn attention to adding to the means we have for conveying the surplus away to the place where it is wanted. Extension of irrigation may be, and doubtless is, of great local utility, and may be advantageously carried out with caution as to embarking large sums on single schemes. But under present circumstances, for the general benefit of the country in all times and in all seasons, the extension of irrigation cannot compare with the extension of railways.

MADRAS.

Madras.

Lieut.-Colonel Mullins.—The data for a proper answer to this question are not available. The results of irrigation have been completely worked out only for one system, the Kistna delta, and final orders in the Revenue Department have not been passed on these. It is improbable that full credit will or can be given in the accounts of the more successful works, for many items of acknowledged beneficial results are not capable of definite estimation, added to which the detailed examination of the Kistna delta irrigation has shown how many causes there are for differences of opinion as to what items are or are not such as should be credited to irrigation. The general conclusions will probably be approximately correct, and the decision come to will be the basis for the accounts of all the other large irrigation works.

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